

September 2020

SYON GARDENS

HOME BASE BRENTFORD SITE, TW7 5QE

Geo-environmental Assessment

Consultant: Waterman Group





Homebase, Syon Lane, Isleworth, TW7 5QE

Geo-Environmental Assessment

September 2020

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Contents

Executive Summary

1.	Introduction	1
1.1	Objectives	1
1.2	Site and Surrounding Environment.....	1
1.3	Proposed Development	1
1.4	Regulatory Context	2
1.5	Limitations	3
2.	Procedures	5
3.	Outline Conceptual Model	6
3.1	Anticipated Ground Conditions and Hydrogeological Significance.....	6
3.1.1	Ground Stability.....	7
3.1.2	Radon Gas.....	7
3.2	Hydrology	7
3.3	Potential Contamination Sources.....	8
3.3.1	Historical Potential Sources of Contamination.....	8
3.3.2	Current Potential Sources of Contamination	9
3.4	Contaminants of Concern	10
3.5	Outline Conceptual Model.....	11
4.	Rationale and Specific Objectives	14
5.	Methodology	15
5.1	Design of the Investigation.....	15
5.2	Quality Control	16
6.	Site Activities	17
6.1	Design of Investigation.....	17
6.2	Ground investigation	17
6.2.1	Boreholes.....	17
6.2.2	Window Sample Holes.....	18
6.2.3	Hand Dug Pits	18
6.3	Soil Sampling	18
6.4	Monitoring Wells.....	19
6.5	Groundwater Monitoring and Sampling	19
6.6	Ground Gas and Vapour Monitoring.....	19
7.	Results	20
7.1	Geological Strata.....	20
7.2	Underground Structures and Obstructions	20
7.3	Visual and Olfactory Evidence of Contamination.....	21

7.4	Chemical Analysis.....	21
7.5	Groundwater Levels.....	21
7.5.1	Groundwater Strikes.....	21
7.5.2	Groundwater Monitoring.....	21
7.6	Ground Gas and Vapours.....	22
9.	Generic Assessment Criteria.....	26
9.1	Site Specific Information used to Support the Generic Risk Assessment.....	27
10.	Quantitative Environmental Risk Assessment – Risk Estimation.....	29
10.1	Risk to Human Health.....	29
10.1.1	Future Site Users.....	29
10.1.2	Off-site users.....	31
10.2	Ground Gas and Vapours.....	31
10.2.1	Ground Gas.....	31
10.2.2	Vapours.....	32
10.2.3	Off-site Users and Structures.....	33
10.3	Risk to Controlled Waters.....	33
10.4	Risk to Ecological Systems/Vegetation.....	35
10.5	Risk to Water Supply Pipes and other Buried Infrastructure.....	35
10.6	Risk to Construction Workers.....	35
12.	Revised Conceptual Model.....	38
13.	Conclusions and Recommendations.....	43
13.1	Conclusions.....	43
13.2	Earthworks and Construction Considerations.....	43
13.2.1	Asbestos Containing Materials.....	44
13.3	Geotechnical.....	45
13.4	Recommendations.....	47
13.4.1	Environmental.....	47
13.4.2	Geotechnical.....	48

Tables

Table 1:	Anticipated ground conditions at the Site.....	6
Table 2:	Contaminants of concern.....	10
Table 3:	Outline conceptual model.....	12
Table 4:	Ground investigation strategy.....	15
Table 5:	Summary of fieldwork activities.....	17
Table 6:	Geological strata encountered.....	20

Table 7:	Recorded groundwater Levels	22
Table 8:	Ground gas and vapour monitoring summary	23
Table 9:	Standard Penetration Results	25
Table 10:	Generic assessment criteria.....	26
Table 11:	Summary of GAC exceedances for human health – Organic Contaminants	29
Table 12:	Summary of total speciated TPHs and speciated PAHs above the laboratory limit of detection.....	30
Table 13:	Borehole hazardous gas flow rates.....	32
Table 14:	Summary of generic quantitative risk assessment for controlled waters	34
Table 15:	Indicative pile capacities	36
Table 16:	Revised conceptual model for the Site	39
Table 17:	Indicative pile capacities	45

Appendices

Appendix A	Site Plans
Appendix B	Site Photographs
Appendix C	Ground Investigation Factual Report
Appendix D	Third Party Correspondence
Appendix E	Ground Gas and Groundwater Monitoring Results
Appendix F	Environmental Laboratory Analysis
Appendix G	Risk Rating Matrix
Appendix H	Environmental Receptors
Appendix I	Generic Assessment Criteria

Executive Summary

Objectives

Waterman Infrastructure & Environment Limited was instructed by St Edward Homes Ltd to undertake a Geo-Environmental Assessment for the proposed redevelopment of land comprising Homebase, Syon Lane, Isleworth, TW7 5QE.

Site Setting

Current Use	Homebase home improvement store, car park and garden centre
History	Isleworth Winery and later Allied Breweries, unspecified industrial structures and works, unspecified mound and potentially infilled pond.
Ground Conditions	Tarmacadam over Made Ground up to about 2.5m thick where proven, then Taplow Gravel Member (locally absent) up to about 3m thick where proven, over London Clay Formation at least 9m thick.
Controlled Waters	The Taplow Gravel Member is classified as a Principal Aquifer. The London Clay Formation is classified as unproductive stratum. The closest significant surface water body to the Site is the River Brent approximately 500m north-east at its closest point.
Ground Gas Regime	The ground gas monitoring results indicate the Site would be classified as a Characteristic Situation 1 (CS-1) – Very low risk. Ground gas protection measures are not required. However, this assessment is preliminary and further ground gas monitoring would be required to confirm these findings. Soils, vapour and groundwater analysis indicate a significant vapour regime is not present across the Site. However, localised hydrocarbon impacted soils and groundwater could be acting as a source of vapour and may require further investigation and mitigation as part of redevelopment works.

Conceptual Model

Potential contaminant linkages identified for the Site which may require mitigation measures include: future site users' potential direct contact, inhalation and ingestion with residual elevated concentrations of speciated PAHs in Made Ground. Disturbance of potential asbestos containing materials and inhalation of fibres in Made Ground by future site users. Direct contact, inhalation and ingestion of contaminants in soils by construction workers. Inhalation of ground gas and vapours by construction workers within confined spaces, risk of asphyxiation and explosions. Inhalation of potentially contaminated dust by off-site users during construction works. Direct contact and chemical attack by contamination on buried services and structures. Contamination of drinking water supply.

Conclusions

On the basis of the information obtained from the intrusive investigation the Site is considered to represent a **medium** risk.

The risk rating is based on the following:

- Widespread significant contamination of soils and groundwater has not been identified at the Site. However, collection of soil data in the footprint of the Homebase store has not been possible;
- A residual slightly elevated concentration of dibenzo(ah)anthracene was reported in one exploratory hole location. Asbestos was reported in soils at four exploratory hole locations. A certified clean capping layer or hardstanding would break the potential contaminant linkages between these contaminants and future Site users;
- Chemical analysis indicates residual contamination is present in groundwater and perched water at the Site. Elevated concentrations of speciated TPH were reported in a groundwater sample recovered from WS2 in the south.
- Localised hydrocarbon impacted soils and groundwater could be acting as a source of vapour and may require further investigation and mitigation as part of redevelopment works.

The potential pollutant linkages can be managed by design of appropriate mitigation measures during the redevelopment of the Site. Following the implementation of the recommendations, post development, the Site would be of **low** risk and should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990 and the requirements of the NPPF would be met.

Earthworks and Construction Considerations

- Buried obstructions may be widespread across the Site and are likely to consist of relic footings and foundations of previous Site uses and the existing foundations of the Homebase store;
- There is potential for buried tanks and associated infrastructure to be encountered during earthworks which may contain residual quantities of fuel;

-
- Uncontaminated concrete may be recovered for reuse on-Site. This would be subject to compliance with the WRAP Quality Protocol for Production of Aggregates from Inert Waste or recovered as inert waste subject to acceptance at an appropriately permitted facility;
 - Soil with reported speciated TPH concentrations >1000mg/kg may be classified as hazardous for waste disposal purposes. Sampling and assessment of waste soils in accordance with Environment Agency guidance documentation will be required to confirm this;
 - Where hydrocarbon contamination in groundwater or perched water is present, this will need to be appropriately managed during excavation works. Where dewatering of excavations is required, pockets of water may require treatment to lower TPH concentrations if disposal to sewer under a discharge consent is to be undertaken;
 - Removal of soils from the Site can be minimised by their reuse on Site to facilitate filling where required provided they are chemically and geotechnically suitable. Re-use of soils on Site should be in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice (DoWCoP), subject to appropriate sampling and testing, risk assessment and compliance with the requirements of the DoWCoP;
 - All site works will need to be managed to prevent contamination or pollution of the Taplow Gravel Member Principal Aquifer. Measures include containment of fuels, oils and other hazardous substances in suitably bunded facilities, monitoring of these facilities, control of refuelling activities, spill response procedures, control of all discharges, management of run off from work areas and compounds;
 - A Foundation Works Risk Assessment (FWRA) may be required by London Borough of Hounslow/ Environment Agency to demonstrate mitigation measures to protect underlying groundwater from any residual contamination in soils and groundwater from piling activities;
 - Potential risks to construction workers and ground workers can be mitigated by the use of standard health and safety measures including personal protective equipment (PPE) and if necessary respiratory protective equipment (RPE) and conformance with the Confined Space Regulations 1997, Construction, Design and Management (CDM) Regulations 2015, Control of Substances Hazardous to Health (COSHH) Regulations 2002 and Control of Asbestos Regulations 2012;
 - The potential for unexploded ordnance (UXO) at the Site cannot be discounted. A detailed UXO desk study should be undertaken and its findings and recommendations considered during subsequent intrusive Site works;
 - Fuel and hazardous substance storage should be in accordance with the Control of Pollution (Oil Storage Regulations (England) 2001 and COSHH Regulations 2002 respectively. Bulk storage of fuel should only be permitted in double skinned tanks (integrally bunded).

Asbestos Containing Materials

- Asbestos in Made Ground is not unexpected for post-industrial sites. The source of asbestos in Made Ground is typically historical demolition of buildings constructed before 1999 when The Asbestos (Prohibitions) (Amendment) Regulations 1999 came into force;
- Asbestos was reported in soils at four exploratory hole locations. Reported concentrations ranged from <0.001% (below the laboratory limit of detection) to 0.027%. Asbestos visible to the naked eye was not observed in soils. However, the potential for some waste soils to be classified as hazardous waste for disposal purposes should be considered;
- The hazardous waste threshold for the presence of asbestos in soils (where asbestos is not visible to the naked eye) is 0.1%. Whilst none of the screened samples exceeded this threshold, the presence of degraded asbestos containing materials (ACMs) at the microscopic level can be indicative of larger ACMs visible to the naked eye elsewhere in soils;
- Visible ACM debris in waste soils, if present in discreet pockets, could be managed by hand picking to potentially reduce disposal costs by separating asbestos from the soil matrix. This will allow waste soil to have its own waste classification. This task could be non-licensed or licensed depending on the type of asbestos and its condition;
- Construction workers should be asbestos awareness trained and an asbestos management plan, in accordance with Control of Asbestos Regulations 2012, prepared. This should include detailed risk assessments, provision of appropriate PPE and RPE, mitigation measures for dust generation and asbestos air monitoring.

Preliminary Geotechnical Assessment

This development comprises multi-storey buildings (up to seventeen storeys, and a lower ground floor level); it is recommended a pile foundation solution be considered with the loads being transmitted to the London Clay Formation. Indicative resistances of a single bored pile at varying depths and diameters in London Clay Formation, based on previous sites in similar conditions, is presented below **but should not be relied upon for design**;

Estimated Pile Resistance (bored pile) kN				
Pile Length (m below cut-off level)	750mm	900mm	1050mm	1200mm
5	425	550	700	850
10	825	1000	1250	1500
20	1850	2300	2800	3300
30	3250	4000	4800	5600
40	3850	5550	7200	8400

These estimates should be confirmed upon completion of a detailed ground investigation and suitable suite of geotechnical laboratory testing including BRE SD1 testing as London Clay is well known to contain pyrite.

The final design of the piles will be the responsibility of the piling contractor. The carrying capacity of the actual pile groups will in part depend on the number, type and size of pile chosen by the contractor and the quality of workmanship. The piles should be designed based on the requirements of Eurocode 7.

The type of pile selected, and method of installation, requires careful consideration in relation to the potential to create a contamination pathway between shallow and deep aquifers, and may need agreement with the Environment Agency;

Due to the anticipated depth of the lower ground floor (circa 3m to 6.5m bgl) it is likely that ground bearing floor slabs can be adopted in the design as they will be founded on a blinding layer on the London Clay. This should be considered in conjunction with the wider foundation design strategy, accounting for the likelihood of piled foundations. The design of the slabs should only be finalised on completion of a gas monitoring assessment in order to allow for the incorporation of gas protection measures (if any);

Groundwater has been recorded at a minimum depth of 0.90m bgl in WS1. Until additional monitoring data is received, it is suggested that groundwater level for design purposes is considered to be 0.90m bgl. However, this level is subject to revision on receipt of further data.

Given the lower ground floor excavation depths groundwater control may be required during construction and permanent design works to maintain a dry and stable environment. Appropriate dewatering measures employed should be in accordance with relevant guidance such as CIRIA Report C750, Groundwater control: design and practice, second edition (2016);

Groundwater inflow to excavations may promote instability and temporary works measures should include an allowance for groundwater control. In addition, pockets of perched groundwater and unstable materials in other areas of the Site which have not been investigated cannot be entirely discounted. In line with BS:6031 (2009), all excavations should be examined daily by a competent person to ensure that they remain safe and stable;

Where the sides cannot be graded back to a safe angle, as approved by a competent and experienced person, their continued stability should not be taken for granted. All excavations of greater than 1.2m depth requiring man entry must be provided with a suitably designed shoring support system. For excavations of over 1.20m depth, groundwater control in the form of excavation of sumps and pumping to agreed discharge points may be required.

Recommendations

Environmental

- The presence of asbestos in soils should be included in the Site's asbestos register;
- Consideration should be given to inaccessible areas of the Site during the ground investigation and uncertainties pertaining to the contamination status in these areas;
- Consideration should be given to potentially widespread buried obstructions across the Site, likely to consist of relic footings and foundations of previous Site uses and the existing foundations of the Homepage store;

-
- A watching brief for buried tanks and associated infrastructure should be undertaken during earthworks. Any buried tanks and associated infrastructure encountered should be appropriately decommissioned and removed from Site. Any impacted soils and groundwater should be subject to risk assessment and, if found to pose an unacceptable risk to receptors, subject to remediation and/or removal;
 - The potential for some soils to be classified as hazardous for waste disposal purposes should be considered. Additional exploratory holes and laboratory testing of soils around WS1 and WS2 are recommended to delineate the extent of hydrocarbon impacted soils and groundwater;
 - Retention of groundwater and ground gas monitoring wells installed as part of this ground investigation to enable future monitoring of ground gas and groundwater;
 - Detailed environmental and geotechnical ground investigation once the design of proposed development has been finalised. This should target areas of the Site not accessible during this ground investigation, including the footprint of the Homebase store. The presence of buried obstructions should also be investigated;
 - Waste classification assessment of likely waste soil arisings should be undertaken as part of the detailed environmental and geotechnical ground investigation. Exploratory holes for waste classification purposes should target proposed lower ground floorexavation areas and where Site levels are to be reduced;
 - Further environmental and geotechnical ground investigation should also include ground gas, vapour and groundwater monitoring and sampling of monitoring wells;
 - A detailed UXO desk study should be undertaken and its findings and recommendations considered during subsequent intrusive Site works;
 - Preparation of a Remediation Strategy, based on the findings of the Geo-Environmental Assessment report, detailing how potentially unacceptable risks to identified receptors will be mitigated at part of the development and a Verification Report confirming the implementation of the mitigation measures. Both documents should be suitable for submission for planning.
-

Geotechnical

As the preliminary ground investigation provided limited geotechnical information, and the proposed development involves multi-storey buildings (up to seventeen storeys, and a lower ground floor), additional ground condition information such as shear strength, groundwater level and porewater pressure is required.

To establish this information, a further ground investigation is required comprising boreholes to depths in the region of 40m bgl with associated in-situ testing, standpipe and piezometer installation; and geotechnical laboratory testing of recovered samples. Geotechnical interpretative reporting should include:

- Identification of suitable piling depths and founding stratum for shallow foundations;
- Geotechnical parameters for foundation and pavement design;
- Indicative bored pile estimates must be confirmed upon completion of final ground investigation;
- Establish aggressivity of the soils/bedrock in relation to buried concrete; and
- Establish groundwater levels and potential impact on foundations design and temporary works.

1. Introduction

1.1 Objectives

Waterman Infrastructure & Environment Limited (Waterman) was instructed by St Edward Homes Ltd (hereafter “the Client”) to undertake a Geo-Environmental Assessment for the proposed redevelopment of land comprising Homebase, Syon Lane, Isleworth, TW7 5QE (hereafter termed “the Site”).

The information contained in this report is based on the observations made on-Site, the data obtained from an intrusive ground investigation undertaken by Geotechnical Engineering Limited in October and November 2018 and publicly available environmental data.

The objective of this assessment is to identify significant contaminative risk attached to the Site. The assessment considers the UK’s regulatory regime in relation to contaminated land, and additional external factors which may affect this risk. A preliminary assessment of the geotechnical conditions on-Site, as informed by the ground investigation, is also presented.

1.2 Site and Surrounding Environment

The Site is a rectangular plot of land located on the corner of Syon Lane and the Great West Road at Gillette Corner. It has an area of approximately 1.4 ha. The Site is developed with a large single level Homebase store (4,180sqm) and associated surface car parking and under-croft car parking (295 spaces). The Homebase store comprises of a large industrial style shed with metal cladding. The building is effectively two storeys high with a central pylon to the front.

The Site is bound by the A4 Great West Road to the north, and Syon Lane to the south-west. There is a car showroom to the east, and a service road, Syongate Way which extends along the south-eastern boundary, and further along is Syon Lane station and railway line.

The surrounding area comprises a mix of uses including commercial and residential development. There are semi-detached houses on the western side of Syon Lane, opposite the site. Along the Great West Road there is a variety of commercial and industrial uses as well as some residential uses, and further along Syon Lane the uses are predominantly residential.

1.3 Proposed Development

The Client seeks permission for:

“Full planning application for the demolition of existing building and car park and erection of buildings to provide residential units, a replacement retail foodstore, with additional commercial, business and service space, and a flexible community space, and ancillary plant, access, servicing and car parking, landscaping and associated works”

Development proposals (hereafter “the Development”) comprise:

- Delivery of 473 high quality homes;
- 38% affordable housing (on a habitable basis);
- A new modern Tesco retail store of circa 10,550 sqm (GIA);
- community space of 200 sqm;
- 137 sqm (GIA) of flexible commercial, business and service space;

- 400 retail car parking spaces;
- 100 residential car parking spaces;
- 3 residential visitor car parking spaces and 2 car club spaces;
- 204 retail cycle parking spaces;
- 896 residential cycle parking spaces;
- Building heights include a four-storey podium with blocks ranging up to seventeen storeys;
- Communal residential amenity space with biodiverse podium gardens including open space and children's play space;
- New active frontages and improved, safer public realm along Syon Lane and the Great West Road;
- Dedicated new pedestrian and cycle friendly 'clean air' route provided between Syon Lane Station and the Great West Road via Syon Gate Way and new eastern street, Syon Gate Lane.

The Development comprises a lower ground floor extending to about 13.4m AOD (up to about 3 to 6.5m below existing Site levels of about 17 to 20m AOD).

Due to its multi-storey nature, and consequent large structural loads, the proposed development is likely to use piled foundations.

The proposed layout is included in Appendix A.

1.4 Regulatory Context

The National Planning Policy Framework (NPPF) 2019 sets out Government planning policy for England and how this is expected to be applied to development. Paragraph 118 of Section 11 – Making effective use of land and paragraphs 170, 178, 179 and 183 of Section 15 – Conserving and enhancing the natural environment of the NPPF relate to contaminated land matters and state the following:

118. Planning policies and decisions should:

c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land;

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

178. Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

183. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.

To assess the contamination status of the Site, with respect to the proposed end use, it is necessary to assess whether the Site could potentially be classified as “Contaminated Land”, as defined in Part IIA of the Environmental Protection Act 1990 and Contaminated Land Statutory Guidance 2012. This is assessed by the identification and assessment of potential contaminant linkages. The linkage between the potential sources and potential receptors identified needs to be established and evaluated.

To fall within this definition, it is necessary that, as a result of the condition of the land, substances may be present in, on or under the land such that:

- a) significant harm is being caused or there is a significant possibility of such harm being caused; or
- b) significant pollution of controlled waters is being caused, or there is significant possibility of such pollution being caused.

It should be noted that DEFRA has advised (Ref. Section 4, DEFRA Contaminated Land Statutory Guidance 2012) Local Authorities that land should not be designated as “Contaminated Land” where:

- a) the relevant substance(s) are already present in controlled waters;
- b) entry into controlled waters of the substance(s) from land has ceased; and
- c) it is not likely that that further entry will take place.

These exclusions do not necessarily preclude regulatory action under the Environmental Permitting (England and Wales) Regulations 2016, which make it a criminal offence to cause or knowingly permit a water discharge of any poisonous, noxious or polluting matter to controlled waters. In England and Wales, under The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009, a works notice may be served by the regulator requiring appropriate investigation and clean-up.

1.5 Limitations

The assessment was undertaken in accordance with the scope agreed between Waterman and St Edward Homes Ltd.

The benefit of this report is made to St Edward Homes Ltd.

Information contained in this report is based on the findings and data from the intrusive ground investigation and observations made on-Site.

Constraints to the investigation include:

- An objective of the investigation was to minimise disruption to the Homebase store's operations. Therefore, exploratory holes could not be advanced in the footprint of the Homebase store;
- Exploratory holes were not advanced on the access road to the delivery yard for health and safety reasons.

The ground conditions reported relate only to the point of excavation and do not necessarily guarantee a continuation of the ground conditions throughout the non-inspected area of the site. Whilst such exploratory holes would usually provide a reasonable indication as to the general ground conditions, these cannot be determined with complete certainty.

Waterman has endeavoured to assess all information provided to them during this investigation, but makes no guarantees or warranties as to the accuracy or completeness of this information.

The scope of this investigation includes an assessment of the presence of asbestos containing materials (ACMs) in the ground at the site but not within buildings or structures or below ground structures (basements, buried service ducts and the like).

The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the Site.

2. Procedures

This Generic Quantitative Environmental Risk Assessment has been undertaken in general accordance with the Model Procedures for Management of Land Contamination (Contaminated Land Report 11 – Environment Agency, September 2004).

The report includes the following:

- collation of available documentary information;
- Site reconnaissance;
- hazard identification;
- formulation of a outline Conceptual Model for the Site;
- results of Intrusive Ground Investigation;
- confirmation of Generic Assessment Criteria used to assess risks;
- assessment of results against Generic Assessment Criteria;
- formulation of a new Conceptual Model for the Site;
- identification of potentially unacceptable risks; and
- recommendations for further action.

This report forms a decision record for the contaminant linkages identified, the generic assessment criteria used to assess risks, the unacceptable risks identified and the proposed next steps in relation to the Site. The report also provides an explanation of the refinement of the outline conceptual model following the ground investigation, the selection of criteria and assumptions, the evaluation of potential risks and the basis for the decision on what happens next.

3. Outline Conceptual Model

The outline Conceptual Model is summarised below. Information sources include:

- Groundsure reports (Enviro Insight and Geo Insight) presented in Appendix D;
- Groundsure historical map packs presented in Appendix D;
- London Borough of Hounslow Land Quality Team records presented in Appendix D;
- London Fire and Emergency Planning Authority (LFEPA) petroleum search records presented in Appendix D;
- British Geological Survey (BGS) mapping Sheet 270 – South London, Bedrock and Superficial Edition;
- BGS online borehole records accessed 22 October 2018;
- DEFRA's MAGIC online geographical dataset accessed 22 October 2018;
- Site reconnaissance undertaken 22 October 2018;
- London Borough of Hounslow online planning records accessed 30 June 2020.

3.1 Anticipated Ground Conditions and Hydrogeological Significance

The likely ground conditions at the Site have been established from BGS mapping Sheet 270 – South London, Bedrock and Superficial Edition and online BGS borehole logs TQ17NE136, TQ17NE140 and TQ17NE240 (accessed online 22/10/2018). Hydrogeological significance of the strata has been established from MAGIC online geographical dataset (accessed online 22/10/2018)

The likely ground conditions and hydrogeological significance are summarised in Table 1.

Table 1: Anticipated ground conditions at the Site

Stratum	Anticipated Nature	Estimated Thickness (m)	Aquifer Designation / Groundwater Comments
Made Ground	Bituminous/concrete hardstanding over variable fill material. Likely to comprise sand, gravel, clay and silt of varying proportions with brick and concrete.	2m	Non-Aquifer. May contain residual pockets of water.
Taplow Gravel Member - Sand and Gravel	Slightly silty SAND and GRAVEL.	Up to 3m (potentially absent in the south)	Principal Aquifer - High permeability and/or provide a high level of water storage. May support water supply and/or river base flow on a strategic scale
London Clay Formation	Silty CLAY with claystone.	80m	Unproductive Strata - Low permeability and negligible significance for water supply or river base flow.

According to the Groundsure Enviro Insight Report (ref: WTM1-5522777), there are two groundwater abstractions within 1km of the Site, recorded 586m south-east and 853m south-east, both for horticultural

watering/spray irrigation. The abstractions are registered to Trustees of Syon Park Estate. The source is detailed as Thames Groundwater.

There are no potable groundwater abstractions within 2km of the Site. The Site is not within a source protection zone (SPZ).

3.1.1 Ground Stability

Ground stability information presented in the Groundsure Geo Insight Report (ref. WTM1-5522778) reports the following ground stability hazard ratings at the Site:

- Moderate for shrink-swell clays;
- Negligible to very low for landslides
- Negligible for compressible deposits;
- Very low for collapsible deposits;
- Negligible to very low for running sands.

The Site is not in an area that could be affected by coal mining activity.

The Geo Insight Report indicates there are no current ground workings within 500m of the Site.

Historical surface ground working features are identified on-Site, including ponds and an unspecified heap shown on historical mapping dating back to 1938.

3.1.2 Radon Gas

Radon is a colourless and odourless radioactive gas, formed from the decay of naturally occurring uranium within soils and rocks. The radioactive elements formed by the decay of radon may be inhaled, entering the lungs, and potentially leading to localised damage, and lung cancer.

Current Building Regulations, endorsed by Public Health England (PHE) detail that all new buildings or extensions require radon protective measures where the development is in an area of high radon.

Information recovered from the Geo Insight Report shows that the Site is not in an area of high radon levels. Correspondingly, no protective measures will be required in the proposed development.

In 2009 the Health Protection Agency ((HPA), now Public Health England) recommended that radon protection measures be built into all new occupied buildings in the UK, whether or not they were situated in radon sensitive area as identified by British Geological Survey (BGS) maps. The Building Regulations Advisory Committee supported the HPA's proposal. However, the then Government rejected this recommendation and the current Building Regulations (2013) do not include it.

This approach should be confirmed with the Building Control Officer.

3.2 Hydrology

The closest significant surface water body to the Site is the River Brent approximately 500m north-east at its closest point. The River Brent flows south-east and into the River Thames approximately 1.6km east of the Site. The River Thames is approximately 1.3 km south-east at its closest point.

A lake within Syon Lane Park is 650m south-east.

Groundwater in the area is likely to flow east towards the River Thames. However, it may be discontinuous in places due to absence of permeable superficial deposits, indicated in the south of the Site and to the east and south of the Site where superficial deposits over the London Clay Formation are indicated as absent.

There are two surface water abstractions within 1km of the Site. The closest is recorded 621m north-east and is registered to Canal and River Trust for non-evaporative cooling. The source is detailed as Thames Surface Water – Non-Tidal.

3.3 Potential Contamination Sources

Potential current and historical contamination sources have been identified following a review of available information sources and Site reconnaissance undertaken 22 October 2018. A summary of potential contamination sources is presented below.

3.3.1 Historical Potential Sources of Contamination

The Site

- 1930s – Isleworth Winery and later Allied Breweries in the west and north-west. Unspecified industrial structure in the south;
- 1930s – Unspecified mound/ potential land raising in the north and west;
- 1960s – Potential infilled pond in the south-east;
- 1960s to 1980s – Unspecified works in the north and west. Unspecified industrial structure in the south. Local authority records indicate the Site was used for food, none food, furniture and other storage;
- 1980s – several unspecified tanks in the north.

London Fire and Emergency Planning Authority (LFEPA) Petroleum Section provided details on a historical 4,750-litre petrol tank on-Site. The tanks location was not available. However, the tank is detailed as water filled and was licensed from May 1988 to April 1997. There is no record to confirm that the tank was ever solid filled or removed from the Site.

A historical Environmental Permit (Part B activity) is listed on-Site for other metal processes. However, the address is detailed as Gillette UK, Gt West Rd, TW7 5ND. Therefore, this Environmental Permit likely relates to the former Gillette European headquarters north of the Site.

The Enviro Insight Report indicates several areas of potentially infilled land on-Site. These include a pond in the south-east of the Site and unspecified ground workings and an unspecified heap in the west.

Available Site records indicate a car wash previously operated in the south of the Site.

Site Surroundings

- 1860s to present – Railways 25m south-east and railways and railway sidings 420m north-east;
- 1930s to 1990s – Brittol House adjacent north-east, likely named after Brittol Syndicate, Ltd, later denoted as works then a factory. The building was understood to have been taken over by Admiralty Oil Laboratories. Brittol Syndicate, Ltd and Admiralty Oil Laboratories were understood to have been involved in research into hydrocarbons for use in transport;

- 1930s to 1980 – Perfume manufactory (later denoted as a factory) 25m north-east;
- 1930s to 1980s – Syon Hill Garage (later denoted as a works) 40m west;
- 1930s to 1980s – Solder manufactory (later denoted as a works) 125m west;
- 1930s to 1980s – Motor car service station (later denoted as a works) 115m north-east
- 1930s to 2000s – Motor car service station (later denoted as works then warehouse) 195m north-east;
- 1930s to 1960s – Paper manufactory 170m north;
- 1930s to 1960s – Engineering works 145m north;
- 1930s to 1960s – Tanks 400m north-east;
- 1930s to 1960s – Folding boats manufactory (later denoted as a factory) 480m north;
- 1930s to 1980s – Imperial Biscuit Works (later denoted as a factory) with potential ancillary buildings, a tank and railway sidings 260m north-east;
- 1930s to 1980s - Rubber tyre manufactory (later denoted as a factory), adjacent cylindrical tanks and railways 230m north-east;
- 1930s to present – Fire extinguisher manufactory (later denoted as a factory) 250m north-east;
- 1960s to present – Numerous unspecified factories, the former European headquarters of Gillette, unspecified works and a depot between 50m and 500m north and north-west;
- 1960s – Potential infilling of pond in the south-east of the Site extends south and south-east outside the Site boundary;
- 1960s to 1980 – Unspecified works and factory 50m north;
- 1960 to 1980s – Unspecified factory 175m north-east;
- 1980s to present – Warehouses 250m north;
- 1980s to present – Waste transfer station 470m north-east;
- 1980s to present – Electricity sub-stations 90m west, 160m north-east and 250m north-east.

The Enviro Insight Report indicates numerous areas of potentially infilled land near to the Site. There is an area of railway cuttings 7m south-east.

The Enviro Insight Report also details a historical Environmental Permit (Part B Activity) 117m south-west for petrol vapour recovery.

There are several records of historical landfill sites within 1km. The closest is recorded 454m west at Transport Avenue Brentford. The waste type is not listed, and the site was last recorded as operational in 1961.

3.3.2 Current Potential Sources of Contamination

The Site

- Made Ground;
- Car parking;

- Potential leaks and spills of solvents, paints and other potentially contaminative substances pertaining to home improvement;
- Potential petrol interceptor in the south.

Site Surroundings

- Railways 25m south-east and railways and railway sidings 420m north-east;
- PFS (Part B Environmental Permit) 128m west for unloading of petrol into storage at service stations;
- Dry cleaners (Part B Environmental Permit) 183m west;
- PFS (Part B Environmental Permit) 299m north-west for unloading of petrol into storage at service stations;
- Record of a pollution incident in August 2001 at the PFS 299m north-west, involving petrol;
- Non-hazardous waste incineration (Part A1 Environmental Permit) 365m north;

The Enviro Insight Report includes eight records of licensed waste sites within 1km. The closest is 400m north-east, registered to Rentokil Initial UK Ltd for a household, commercial and industrial waste transfer station.

The Enviro Insight Report also lists numerous current potentially contaminative land uses within 250m. The closest are listed as new vehicles and vehicle repair, testing and servicing 14m north-east. Other land uses listed include hospitals, railway stations, junctions and halts, electricity sub-stations, construction services, business parks and estates, waste storage, processing and disposal, container and storage, and unspecified works and factories.

3.4 Contaminants of Concern

Contaminants of concern associated with the above activities are summarised in Table 2.

Table 2: Contaminants of concern

Source	Associated Contaminants
On-Site (current)	
Made Ground (including infill materials)	Asbestos and metal/metalloids, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs) volatile organic compounds (VOCs) / semi-volatile organic compounds (SVOCs). Ground gases – carbon dioxide, methane, hydrogen sulphide
Potential petrol interceptor	TPH, PAHs, BTEX
Car park	TPH, PAHs, BTEX
On-Site (historic)	
Car wash	Soaps/detergents and chemicals, oils/fuels (TPH, PAH, VOCs/SVOCs), antifreeze (ethylene glycol, glycerol)
Isleworth Winery	Asbestos, metal/metalloids, TPH, BTEX, PAHs, VOCs, SVOCs
Unspecified tanks and petrol tank	TPH, PAHs, BTEX, VOCs, SVOCs
Historic fill materials	Potentially contains asbestos and metal/metalloids, TPH, PAHs, VOCs, SVOCs.

Source	Associated Contaminants
	Ground gases – carbon dioxide, methane, hydrogen sulphide
Unspecified works and industrial structures	Asbestos, metal/metalloids, TPH, BTEX, PAHs, VOCs, SVOCs, PCBs
Off-site (current)	
Railways	Asbestos, metal/metalloids, PAHs, TPH and VOCs/SVOCs, herbicides, polychlorinated biphenyls, PCBs, invasive species (Japanese Knotweed)
Dry Cleaners	VOCs, SVOCs
PFS	Metal/metalloids, TPH, PAHs, BTEX, VOCs/SVOCs
New vehicles and vehicle repair, testing and servicing	Metal/metalloids, TPH, PAHs, BTEX, VOCs/SVOCs
Non-hazardous waste incineration	Metals/metalloids, TPH, PAHs, BTEX, VOCs/SVOCs, PCBs,
Waste transfer station - household, commercial and industrial waste	Asbestos, metal/metalloids, TPH, PAHs, BTEX, VOCs/SVOCs, PCBs
Electricity sub-stations	Asbestos, transformer oil containing PCBs
Unspecified works and factories	Asbestos, metal/metalloids, TPH, BTEX, PAHs, VOCs, SVOCs
Off-site (historic)	
Railways and railway sidings	Asbestos, metal/metalloids, PAHs, TPH and VOCs/SVOCs, herbicides, PCBs, invasive species (Japanese Knotweed)
Brittol House	Ethers, TPH, PAHs, BTEX, VOCs/SVOCs
Motor car service stations	Asbestos, metal/metalloids, TPH, PAHs, BTEX, VOCs/SVOCs
Imperial Biscuit Works	Asbestos, metal/metalloids, TPH, BTEX, PAHs, VOCs, SVOCs
Rubber tyre manufactory	Asbestos, metals/metalloids, TPH, BTEX, PAHs, VOCs, SVOCs, PCBs, cyanides, phenols
Paper manufactory	Asbestos, metal/metalloids, TPH, BTEX, PAHs, VOCs, SVOCs, PCBs, phenols, sulphur, sulphates, sulphides, sulphites, phosphates, chlorates
Folding boats manufactory	Asbestos, metal/metalloids, TPH, BTEX, PAHs, VOCs, SVOCs
Garages	Asbestos, metal/metalloids, TPH, PAHs, BTEX, VOCs/SVOCs
Unspecified tanks	TPH, PAHs, BTEX, VOCs, SVOCs
Electrical substations	Asbestos, transformer oil containing PCBs
Unspecified depots, warehouses, works and factories	Asbestos, metal/metalloids, TPH, BTEX, PAHs, VOCs, SVOCs, PCBs
Historical landfills and infilled land	Asbestos, contaminated leachate containing - metal/metalloids, TPH, BTEX, PAHs, VOCs, SVOCs, PCBs. Ground gases – carbon dioxide, methane, hydrogen sulphide

3.5 Outline Conceptual Model

Following assessment of data gathered from the review of historical maps, site investigation data and details of the proposed development, an outline conceptual model has been produced and is summarised in Table 3.

Table 3: Outline conceptual model

Receptor	Potential Sources	Pathways	Preliminary Risk
Human Health			
Future Site Users	Contaminated shallow soils and groundwater	Direct contact, inhalation and ingestion	Medium
	Ground gas and vapours from organic constituents and volatile compounds in Made Ground, volatile compounds in shallow groundwater	Ingress into structures, accumulation, inhalation, risk of asphyxiation and potential for explosion.	Medium
Off-site residents/users	Contaminated Made Ground	Dust generation during ground works, inhalation by off-site users.	Medium
	Ground gas and vapours from organic constituents and volatile compounds in Made Ground, volatile compounds in shallow groundwater	Off-site migration of contaminants via groundwater flow through permeable strata, ingress of vapours into off-site structures. Off-site migration of ground gas through permeable strata, ingress of ground gases into off-site structures. Inhalation, risk of asphyxiation and potential for explosion.	Medium
Construction workers	Contaminated shallow soils and groundwater	Direct contact inhalation and ingestion.	Medium
	Ground gas and vapours from organic constituents and volatile compounds in Made Ground, volatile compounds in shallow groundwater	Inhalation within confined spaces, risk of asphyxiation and explosions.	Medium
Property			
On-Site structures	Contaminated soils and groundwater	Direct contact. Chemical attack on buried services and structures. Contamination of drinking water supply.	Medium
	Ground gas and vapours from organic constituents and volatile compounds in Made Ground, volatile compounds in shallow groundwater	Ground gas/vapour ingress and accumulation within structures, leading to potential explosion.	Medium
Off-site structures	Contaminated groundwater	Off-site migration of contamination by groundwater flow resulting in direct contact with off-site structures.	Medium
	Ground gas and vapours from organic constituents and volatile compounds in Made Ground, volatile compounds in shallow groundwater	Off-site migration of contaminants via groundwater flow through permeable strata, ingress of vapours into off-site structures. Off-site migration of ground gas through permeable strata, ingress of ground gases into off-site structures. Risk of explosion.	Medium

Receptor	Potential Sources	Pathways	Preliminary Risk
Ecological Systems			
Soft landscaping	Contaminants in soils and shallow groundwater	Direct contact. Root uptake	Medium
Controlled Waters			
Taplow Gravel Member - Principal Aquifer	Contaminants in soils and shallow groundwater	Leaching into groundwater. Lateral migration. Preferential pathways created by piling activities.	Medium

4. Rationale and Specific Objectives

The objective of this investigation is to characterise the ground conditions and identify significant contaminative risks attached to the Site, which may impact upon the proposed development.

The Development comprises a residential-led scheme.

Specific objectives include:

- Assess ground conditions and contaminants and determine whether contamination exists in the soils and groundwater, as a result of current and historical Site uses;
- Generic Quantitative Risk Assessment for contaminant linkages;
- Preliminary characterisation of the ground gas and vapour regime and determine whether ground gas and vapours pose a potential risk to future Site users and buildings;
- Assess the potential for third party liabilities from potential contamination in soils and groundwater.

5. Methodology

The intrusive investigation was undertaken in general accordance with Eurocode 7, the Code of Practice for Ground Investigations BS 5930 (2015) and the Code of Practice for the Investigation of Potentially Contaminated Sites and its Investigation BS 10175 (2011+A2: 2017).

5.1 Design of the Investigation

Sampling locations were selected to characterise the features identified in the conceptual model and to target, as far as possible, potentially contaminated areas identified.

A summary of the investigation locations and features investigated is presented in Table 4.

Table 4: Ground investigation strategy

Layer / Target feature	Exploratory Holes	Groundwater and Gas Monitoring Wells
Establish shallow ground conditions in the vicinity of historical tanks.	WS1, WS5	WS1 – Targeting Made Ground and upper horizons of the Taplow Gravel Member. Response zone 0.50 – 1.60m bgl.
Establish shallow ground conditions in the vicinity of potential petrol interceptor	BH3	BH3 – Targeting Made Ground. Response zone 0.50 – 1.70m bgl.
Establish shallow ground conditions on the perimeter of the Site and triangulate groundwater flow direction and groundwater quality flowing onto and off Site.	BH1, BH2, BH3	BH1 – Taplow Gravel Member and upper horizons of London Clay Formation. Response zone 3.00 – 5.00m bgl. BH2 – Targeting Taplow Gravel Member. Response zone 0.80 – 4.00m bgl. BH3 – As above
Establish shallow ground conditions in the historical location of the Isleworth Winery.	BH1, WS3, WS4	BH1 – As above WS3 – Targeting Made Ground and upper horizons of the Taplow Gravel Member. Response zone 0.50 – 1.20m bgl.
Establish shallow ground conditions in the historical location of unspecified works in the north and west of the Site.	BH1, WS4, WS5	BH1 – As above
Establish shallow ground conditions in the historical locations of unspecified industrial structures in the south of the Site	BH3, WS1, WS2	BH3 – As above WS1 – As above WS2 – Targeting Made Ground, suspected pond sediment and upper horizons of London Clay Formation.
Establish shallow ground conditions in historical location in potentially infilled pond in the south-east of the Site	WS2	WS2 – As above

Establish shallow ground conditions in the former location of a car wash	BH1, BH3	BH1 – As above BH3 – As above
Establish ground conditions in historical location of unspecified ground workings and heap	BH1	BH1 – As above
Advance borehole to 15m to provide information on deeper ground conditions	BH1	BH1 – As above

5.2 Quality Control

A Waterman Geo-Environmental Engineer monitored the performance, quality of work and health and safety compliance throughout the investigation period.

Samples were despatched in batches on a daily basis under a chain of custody procedure to i2 Analytical UK Ltd who are a UKAS accredited laboratory, for subsequent chemical analysis. Where appropriate, samples were stored within cool boxes containing ice packs.

All contractors, including laboratories, used during this project have been approved by Waterman as a part of in-house Integrated Management System (BS ISO 9001, BS ISO 14001) procedure. This requires all third parties to demonstrate competence and a high standard of work during a regular audit scheme.

6. Site Activities

The works were procured to various contractors, which, along with the main activities and supervision, are shown in chronological order in Table 5:

Table 5: Summary of fieldwork activities

Phase of Work	Activity	Contractor	Date	Supervision
Service Clearance of Exploratory Hole Locations	Scanning of exploratory hole locations and tracing service runs	Geotechnical Engineering Ltd	26 October 2018	Geotechnical Engineering Ltd
Ground investigation	1 hand dug pit to 1.20m bgl max. depth. Soil sampling and logging	Geotechnical Engineering Ltd	6 November 2018	Geotechnical Engineering Ltd / Waterman
	Four window sample hole locations to a maximum depth of 5m bgl		1 November – 5 November 2018	
	Three borehole locations to a maximum depth of 14.45m bgl		5 November– 14 November 2018	
	UXO clearance of exploratory hole locations by specialist clearance engineer.	1 st Line Defence	1 November – 14 November 2018	Geotechnical Engineering Ltd
Monitoring Well Installation	Installation of ground gas and groundwater monitoring wells.	Geotechnical Engineering Ltd	1 November – 14 November 2018	Geotechnical Engineering Ltd / Waterman
Groundwater Level and Ground Gas/Vapour Monitoring	Ground gas and vapour monitoring, groundwater level monitoring and sampling on one occasion.	Waterman	20-21 November 2018	N/A

Note: m bgl = metres below ground level

6.1 Design of Investigation

Each exploratory hole location was cleared for services using ground penetrating radar (GPR) and a cable avoidance tool (CAT scanner). Inspection covers were lifted, and drainage runs traced.

Hand pits were dug at each of the borehole and window sample hole locations prior to the commencement of drilling.

6.2 Ground investigation

The rationale behind exploratory hole locations is detailed in Table 4 and the exploratory hole locations are shown in Appendix A. Site photographs are shown in Appendix B.

6.2.1 Boreholes

Three boreholes were advanced using dynamic sampling and rotatory techniques to a maximum depth of 15.45m bgl.

6.2.2 Window Sample Holes

Four window sample holes were advanced to a maximum depth of 5m bgl. All window sample locations were advanced using a tracked window sample rig. Proposed window sample location WS5 could not be drilled due to the footpath being too narrow to accommodate the window sample rig and required working area. Therefore, WS5 was replaced with a hand-dug pit (HP5) to 1.2m bgl to gather shallow soil samples at this location.

6.2.3 Hand Dug Pits

One hand-dug pits (HP5) was excavated to 1.2m bgl. Upon completion, hand-dug pit was backfilled with compacted arisings placed in the same order as encountered.

6.3 Soil Sampling

Exploratory holes were logged and sampled for environmental purposes.

Representative environmental soil samples were obtained from the exposed strata and sealed in one litre plastic tubs with airtight lids, phials and glass jars. The environmental soil samples taken were subject to headspace screening by a photo ionisation detector (PID).

Standard Penetration Tests (SPTs) were undertaken at regular intervals in boreholes and window sample holes for geotechnical purposes.

Scheduling of soils laboratory analysis was informed by the contaminants of concern identified in Table 2 and observations of visual and olfactory evidence of contamination made on-Site. Determinands tested for are detailed below with the number of tests shown in brackets:

- Soil Properties (pH, moisture content, soil organic matter (SOM)) (23);
- Metals (arsenic, barium, beryllium, water soluble boron, cadmium, chromium, chromium VI, copper, mercury, lead, nickel, selenium, vanadium, zinc and molybdenum) (19);
- Speciated TPH (C5-C44) (22);
- BTEX (22);
- MTBE (Methyl tert-butyl ether) (22);
- 17-Speciated PAHs (17);
- Cyanides (total, free, complex) (1);
- PCBs (2);
- VOCs and tentatively identified compounds (TICs) (11);
- SVOCs and TICs (11);
- Glycols (2);
- Asbestos (12);
- Speciated phenols (1);
- Ammoniacal nitrogen (1);
- Sulphur, sulphide and sulphate (1).

6.4 Monitoring Wells

On completion of drilling, a 50mm diameter slotted HDPE standpipe with gas tap and bung was installed in each borehole and three of the window sample holes (WS1, WS2, and WS3) to enable future ground gas, vapour and groundwater monitoring and sampling. The response zone of the wells was within the Made Ground, Taplow Gravel Member, and upper horizons of the London Clay Formation.

The intake section comprised a slotted pipe surrounded by a granular response zone and the plain sections of pipe surrounded by a bentonite seal. The monitoring wells are sealed by a rubber bung and kept secure by a lockable flush cover at ground level.

6.5 Groundwater Monitoring and Sampling

One round of groundwater sampling was undertaken using low flow sampling techniques following the completion of the intrusive element of the ground investigation. Groundwater monitoring was undertaken on the 20 November 2018. However, access to BH1 for groundwater monitoring was not possible on this date. Therefore, BH1 was returned to the following day (21 November 2018).

During the sampling event the presence of hydrocarbon free product was investigated using a dedicated disposal bailer at each monitoring well. Free product was not observed. No visual or olfactory evidence of contamination was noted during groundwater sampling. Groundwater levels were recorded using a dip meter. Monitoring wells BH3 and WS3 were dry during the monitoring visit.

Groundwater in BH1 was very silty and, as a result, could not be analysed as a liquid by the laboratory. Therefore, the sample from BH1 was submitted as a solid for leachate analysis.

The collected water samples were sealed into bottles with pre-measured fixatives where necessary, as supplied by the specialist laboratory, and transported in cool boxes to the testing laboratory.

Scheduling of groundwaters laboratory analysis was informed by the contaminants of concern identified in Table 2, observations of visual and olfactory evidence of contamination in groundwater and results of soils laboratory analysis.

6.6 Ground Gas and Vapour Monitoring

One round of ground gas and vapour monitoring was undertaken 20 November 2018. All installed monitoring wells (BH1, BH2, BH3, WS1, WS2, WS3) were accessed.

The atmospheric pressure was recorded as 1003mb on commencement and 1002mb on completion of monitoring. A falling trend in atmospheric pressure was reported between 19 and 21 November 2018¹.

The peak and steady concentration readings of methane, carbon dioxide and oxygen were recorded, together with flow readings and atmospheric pressure. This was undertaken using an infrared gas analyser. Groundwater levels were also measured. Monitoring for VOCs was undertaken using a PID.

Results, including the model type and detection limits of the on-site equipment used for the fieldwork, is presented in Appendix E.

¹ www.meteoblue.com – Atmospheric pressure data for Heathrow between 19 and 21 November 2018. Accessed 22 November 2018

7. Results

7.1 Geological Strata

Detailed logs of the strata encountered, together with records of the soil samples taken are provided in the Ground Investigation Factual Report, included in Appendix C. A summary of the geological strata is presented in Table 6.

Table 6: Geological strata encountered

Soil Type	Depth of Top of Stratum (m bgl)	Thickness (m)	Typical Description
Made Ground	0	0.05 to 0.15	Black and grey tarmacadam
Made Ground	0.05 to 0.15	0.65 to 2.54 thickness not proven in HP5	<p>Slightly silty SAND and GRAVEL with varying proportions of flint, brick, concrete. Occasionally slightly clayey and with fragments of tarmacadam and.</p> <p>Wood fragments up to 50mm between 1.10 and 2.20m bgl in BH1 and up to 100mm between 0.05 and 0.70m bgl in WS1.</p> <p>Gravelly silt with partially decomposed organic matter, flint, concrete and brick between 1.00 and 2.10m bgl in WS2. Potentially reworked pond sediment.</p> <p>Probable sulphur slag between 2.20 and 2.60m bgl in BH1.</p> <p>Reinforced concrete 0.15m thick at 2.60m bgl in BH1.</p> <p>Concrete 0.20m thick at 1.70m bgl in BH3.</p>
Taplow Gravel Member	0.80 to 4.20	<p>0.30 to 2.90 (where proven)</p> <p>Thickness not proven in WS1, WS3, and WS4.</p> <p>Absent in WS2 and BH3</p>	<p>Slightly silty, slightly clayey SAND and GRAVEL. Recovered as slightly sandy gravelly SILT in WS1.</p> <p>Possible pond sediment in WS2 between 2.10 and 2.90m bgl. Recovered as slightly gravelly SILT with frequent fragments (up to 40mm) of partially decomposed organic material and pockets (up to 70mm) of black silt.</p>
London Clay Formation	2.90 to 3.90	Proven to 15.45m bgl	<p>Silty CLAY. Occasionally slightly sandy. Shell fragments reported in BH1 and WS2.</p> <p>Rare pyritic silt partings in BH1 and rare fragments of pyrite (up to 1mm) in WS2.</p> <p>Band of mudstone between 11.70 and 11.90m bgl in BH1.</p>

7.2 Underground Structures and Obstructions

Concrete obstructions were encountered in BH1 and BH3. Concrete with 8mm steel reinforcement was encountered at 2.60 to 2.75m bgl in BH1. Concrete was also encountered at 1.70 to 1.90m bgl in BH3. Core loss was reported directly below the concrete in both BH1 and BH3. The concrete encountered at

these locations is considered likely to be slabs associated with historical on-Site structures including an unspecified works in the north and west and an unspecified industrial structure in the south.

It was not possible to identify the lateral extent of concrete obstructions encountered due to limited working areas available to undertake the investigation and the need to minimise disruption to the operational Homebase store.

The window sample rig was not able to advance through very dense sand, gravel and silt of the Taplow Gravel Member. As such, the maximum drill depth of WS1, WS3 and WS4 was 2.05m bgl.

Core loss and no recovery was recorded in the following boreholes:

- BH1 – 2.75 to 3.90m bgl (core loss); 4.50 to 6.50m bgl (no recovery); and 11.90 to 12.00m bgl (core loss);
- BH3 – 1.90 to 2.20m bgl (core loss). Therefore, the nature of material at these depths at these locations could not be recorded.

7.3 Visual and Olfactory Evidence of Contamination

The following visual and olfactory evidence of contamination was noted during the intrusive investigation:

- BH1 – 2.20 to 2.60m bgl: sulphurous odour and probable sulphur slag;
- WS2 – Hydrocarbon (diesel) odour and PID reading of 28.8ppm in sample taken from 1.00 to 1.20m bgl;
- WS2 – 2.10 to 2.90m bgl: strong organic odour and PID reading of 22.8ppm in sample taken from 2.60 to 2.90m bgl;
- WS2 – 4.30 to 4.40m bgl: strong organic odour.

No visual or olfactory evidence of contamination was observed in sampled groundwater.

7.4 Chemical Analysis

The laboratory test results are presented in Appendix F.

7.5 Groundwater Levels

7.5.1 Groundwater Strikes

Groundwater strikes were not encountered in boreholes and window sample holes. Groundwater was not encountered in boreholes prior to the use of water flush in BH1 and BH3. Use of water flush commenced at 2.60m bgl in BH1 and at 1.70m bgl in BH3. Water flush was not added to BH2.

7.5.2 Groundwater Monitoring

Groundwater level monitoring was undertaken 20-21 November 2018. Recorded groundwater levels are detailed in Table 7.

Table 7: Recorded groundwater Levels

Monitoring Well	Ground Level (m AOD)	Depth to Groundwater (m bgl)	Groundwater Level (m AOD)
BH1	18.699	2.43	16.269
BH2	20.153	2.7	17.453
BH3	16.706	N/A (Dry)	N/A (Dry)
WS1	TBC	0.90	TBC
WS2	14.999	0.95	14.049
WS3	19.969	N/A (Dry)	N/A (Dry)

Recorded groundwater levels ranged from 0.90m bgl in WS1 to 2.70m bgl in BH2. Reduced groundwater levels were between 14.049m AOD in WS2 and 17.453m AOD in BH2, a range of 3.404m. BH3 and WS3 were dry at time of monitoring.

WS1 was not accessible at the time of the level survey. Therefore, a reduced level for this location is not available at present.

Monitoring in BH1 and BH2 indicates groundwater is present in the Taplow Gravel Member in the north of the Site, whereas WS1 and WS2 indicate the presence of perched water in Made Ground. BH3, screening Made Ground, was dry at the time of monitoring. The recorded groundwater level in BH1 (2.43m bgl) indicates groundwater had risen above the screen section of the monitoring well (3.00- 5.00m bgl), potentially due it being confined by a buried concrete slab between recorded 2.60 and 2.75m bgl over the Taplow Gravel Member.

The differential between groundwater levels recorded in the north and the south of the Site indicate groundwater is discontinuous. This is potentially due to the absence of granular deposits of the Taplow Gravel Member in the south of the Site.

Whilst identification of groundwater flow direction on-Site was not possible, it is likely groundwater in the wider area flows east towards the River Thames.

7.6 Ground Gas and Vapours

Ground gas/vapour monitoring was undertaken on 20 November 2018. Ground gas/vapour monitoring results are included within Appendix E. Table 8 summarises the results.

Table 8: Ground gas and vapour monitoring summary

Monitoring Well	No. of monitoring rounds undertaken	Gas Concentration					Flow rate (max L/hr)
		Methane (max % v/v)	Carbon Dioxide (max % v/v)	Oxygen (min % v/v)	Lower Explosive Limit (max %)	Volatile Organic Compounds (max ppm)	
BH1	1	<0.1	0.2	14.3	<0.1	6.3	<0.1
BH2	1	<0.1	0.3	0.4	<0.1	19.1	0.3
BH3	1	<0.1	2.4	14.6	<0.1	0.4	<0.1
WS1	1	<0.1	0.3	17.7	<0.1	2.4	<0.1
WS2	1	<0.1	0.8	11.9	<0.1	9.8	<0.1
WS3	1	<0.1	<0.1	7.2	<0.1	7.6	0.3

Gas flows above the instruments limit of detection ($>0.1\text{l/hr}$) were recorded in BH2 and WS3. 0.3l/hr was recorded in both monitoring wells.

Methane and lower explosive limit readings in all monitoring wells were below the limit of detection ($<0.1\%$ for methane and lower explosive limit). Maximum carbon monoxide and hydrogen sulphide concentrations were recorded as 12ppm and $<1\text{ppm}$ (below the laboratory limit of detection) respectively. The maximum carbon monoxide concentration of 12ppm was recorded in monitoring well BH2.

A peak carbon dioxide reading of 2.4% was recorded. This reading was obtained from BH3. A minimum oxygen concentration of 0.4% was recorded in BH2. A peak VOC concentration of 19.1ppm was recorded in BH2.

VOC concentrations from soil headspace testing ranged from $<0.1\text{ppm}$ to 28.8ppm . The maximum concentration was recorded in WS2 in a sample of Made Ground taken from 1.00 to 1.20m bgl. VOC concentrations recorded during vapour monitoring ranged from 0.4ppm in BH3 to 19.1ppm in BH2.

Concentrations of VOCs and SVOCs in soils are discussed in Section 10.

8. Geotechnical Results

8.1 In-Situ Results

Standard Penetration Tests (SPTs) were undertaken at regular intervals within the boreholes and window samples completed as part of this investigation, in order to provide 'N' values for empirical assessment of strength and density parameters. Detailed results of the SPT tests and blow counts are included on the borehole log included within the Ground Investigation Factual Report in Appendix C and a summary is presented in Table 9.

Table 9: Standard Penetration Results

Stratum	No. of Tests	N Range	Average N Value
Made Ground	4	2 to >50	32
Taplow Gravel Member	6	31 to >50	43
London Clay Formation	15	7 to 33	18

8.2 Geotechnical Laboratory Results

Disturbed samples were obtained from exploratory holes at regular intervals. However, geotechnical laboratory analysis is outside the scope of this investigation.

It is recommended that the geotechnical samples obtained undergo geotechnical laboratory testing or geotechnical testing is completed as part of a detailed ground investigation.

8.3 Groundwater

Groundwater was not encountered within the exploratory holes during the ground investigation. However, groundwater monitoring standpipes have been installed within BH01, BH02, BH03, WS1, WS2 and WS3. The initial monitoring visit was undertaken on 20th November 2018 and recorded a ground water level in WS1 at 0.90m bgl, WS2 at 0.95m, BH1 at 2.43m bgl, and BH2 at 2.70m bgl (WS03 and BH03 were dry). Until additional monitoring data is received, it is suggested that groundwater levels for design purposes is considered to be 0.90m bgl. However, this level is subject to revision on receipt of further data.

9. Generic Assessment Criteria

The information requirements for generic quantitative risk assessment will depend on:

- The substance being assessed;
- The receptors being considered;
- The pathways being considered; and
- The complexity of the site.

The outline conceptual model developed for the Site reported in the Section 3 identified potential contaminant linkages. These potential linkages have been investigated and the results assessed against generic assessment criteria.

The generic assessment criteria selected for each potential contaminant linkage are summarised in Table 10.

Table 10: Generic assessment criteria

Source	Pathway	Receptor	Generic Assessment Criteria
Contaminants present in soils and shallow groundwater.	Direct contact, inhalation and ingestion	Future users of the Site Off Site users	Generic Assessment Criteria for residential end-use without plant uptake. DEFRA Category 4 Screening Levels (C4SLs), LQM/CIEH S4ULs (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3060. All rights reserved), CL:AIRE (2009)
Contaminated soils and shallow groundwater. Ground gas and vapours from soils. Vapours from contaminated groundwater.	Direct contact with soils and groundwater. Inhalation and ingestion. Inhalation of ground gases and vapours. Risk of asphyxiation	Construction workers	Qualitative Risk Assessment.
Contaminants present in shallow soils	Leaching into groundwater. Creation of preferential pathways by piling.	Principal Aquifer in Taplow Gravel Member River Brent	Environmental Quality Standards (EQS) for freshwater and EQS _{bioavailable} .
Ground gas and vapours from soils. Vapours from contaminated shallow groundwater.	Migration through soil matrix and accumulation in internal and confined spaces. Inhalation and risk of asphyxiation.	Future users of the Site Off-site users. On-site and off-site structures	Preliminary Gas Screening Value determination and assessment in accordance with CIRIA C665 and BS8485: 2015. Quantitative assessment of groundwater against the SoBRA derived GACG _{WVAP} for commercial end-use. Semi-quantitative risk Assessment for vapours utilising PID measurements alongside soil and

Source	Pathway	Receptor	Generic Assessment Criteria
	Accumulation and risk of explosion.		groundwater contamination results in accordance with CIRIA C682 and BS8576: 2013.
Contaminants in soils and shallow groundwater.	Direct contact and chemical attack	Buried structures and services	BRE Special Digest 1: 2005 Concrete in Aggressive Ground. UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites

The generic assessment criteria used in this report are included in Appendix I.

9.1 Site Specific Information used to Support the Generic Risk Assessment

The site specific information used to support the generic risk assessment undertaken as part of this investigation are described in the sections below:

Human Health Risk

The data obtained during the ground investigation will be compared to the Waterman GAC for residential end-use without plant uptake with 1% Soil Organic Matter (SOM). 1% was selected as a conservative and consistent approach across the Site and was based on the lowest SOM % identified in the soils.

Human Health Risk – Construction Workers

A qualitative assessment of the risk to construction workers will be undertaken as part of this assessment, given that there are no specific GAC currently available for contamination risks to this receptor.

Controlled Waters

The identified controlled water receptors are the Principal Aquifer in the Taplow Gravel Member and the River Brent.

Groundwater analysis will be screened against EQS – Freshwater and EQS_{bioavailable} to assess potential risks to the River Brent and to assess the quality of groundwater flowing onto and off the Site.

Where no EQS are available, DWS will be applied (if available) for information purposes only. There are no recorded potable water abstractions within 2km of the Site. Therefore, this is a conservative approach to screening quality of the groundwater.

Ground Gas and Vapours

Potential receptors of ground gas generation are considered to be future Site users, off-site users and residents.

The potential risk arising from ground gas will be assessed based of the approach recommended in CIRIA C665, BS 8485: 2015 (assuming a Type A, B, C, or D building), and BS 8576: 2013. A preliminary gas screening value (GSV) for the Site has been derived.

The proposed development is considered a Type B building. A Type B building is described in BS 8485: 2015 as:

“Private or commercial property with central building management control of any alterations to the building or its uses but limited or no central building management control of the maintenance of the

building, including the gas protection measures. Multiple occupancy. Small to medium size rooms with passive ventilation of rooms and other internal spaces throughout ground floor and basement areas. May be conventional building or civil engineering construction. Examples include managed apartments, multiple occupancy offices, some retail premises and parts of some public buildings (such as schools, hospitals, leisure centres) and parts of hotels”

The risk from vapours to human health receptors will be determined quantitatively through assessment of the groundwater concentrations against the GAC_{GWVAP} as derived by The Society of Brownfield Risk Assessment (SoBRA). Based on the ground conditions on-Site this quantitative assessment builds in the following precautionary assumptions;

No biodegradation is occurring between the source term, and the receptor;

The groundwater is at 0.65mbgl;

The geology on-Site is a sandy stratum; and

The omission of capillary fringe between the saturated and unsaturated zones.

The quantitative risk assessment will therefore be inherently conservative in its approach.

A semi-quantitative approach will be used to assess risks from vapours in accordance with CIRIA C682. Concentrations of hydrocarbon vapours (ppm) have been recorded in monitoring wells using a PID. Soil headspace testing has been used to supplement the vapour monitoring along with analysis for VOCs and SVOCs in soil and samples.

Risk to Water Supply Pipes and other Buried Infrastructure

The risk to water supply pipes will be assessed in accordance with the UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites.

The risk to buried structures will be assessed in accordance with the guidelines included within BRE Special Digest 1:2005 Concrete in Aggressive Ground.

Re-use of Topsoil

The proposed development may include areas of soft landscaping. Therefore, the risk to vegetation on the Site from contaminated soils will be assessed in general accordance with the requirements for topsoil as specified in BS3882:2015.

10. Quantitative Environmental Risk Assessment – Risk Estimation

The potential contaminant linkages identified in Section 3.2 have been evaluated using the Generic Assessment Criteria described in Section 8 and Appendix I. The results of this evaluation are reported below:

10.1 Risk to Human Health

10.1.1 Future Site Users

Results of laboratory analysis and screening criteria are provided in Appendix F and Appendix I respectively.

Glycols, BTEX, MTBE, PCBs, speciated phenols and cyanides were not reported above the laboratory limit of detection in soil samples.

Inorganic Contaminants

No exceedances of the GAC for inorganic contaminants were reported.

Organic Contaminants

Exceedances of the GAC for organic contaminants are detailed in Table 11.

Table 11: Summary of GAC exceedances for human health – Organic Contaminants

Contaminant	Generic Assessment Criteria (mg/kg)	No of samples tested	No of Exceedances	Locations (depth m bgl) and strata	Concentration / concentration range (mg/kg)
Dibenzo(ah)anthracene	0.31	20	1	HP5 (0.25-0.40) Made Ground	0.43

A slightly elevated concentration of dibenzo(ah)anthracene was reported in Made Ground at one location (HP5 – 0.25 – 0.40m bgl).

The location of HP5 will form part of a new public realm. Should the public realm comprise soft landscaping, a certified clean capping layer would be required to break the potential contaminant linkages (direct contact, ingestion and inhalation) between residual elevated concentrations of dibenzo(ah)anthracene and future Site users.

Whilst the majority of organic determinands analysed for did not report exceedances of GACs, concentrations of speciated TPHs and PAHs above the laboratory limit of detection were reported in numerous samples. A summary of total speciated TPHs and speciated PAHs is presented in Table 12.

Table 12: Summary of total speciated TPHs and speciated PAHs above the laboratory limit of detection

Contaminant	No of samples tested	Maximum Concentration (mg/kg)	Concentration range where determinand concentrations reported above LOD (mg/kg)	Location and depth of maximum concentration (depth m bgl)
Total Speciated TPH				
Total Aliphatic and Aromatic TPH (C5 – C44)	22	2381.7	41.6 – 2381.7	WS2 – 1.00 – 1.20
Speciated PAHs				
Naphthalene	20	0.25	0.25	WS4 – 1.10 – 1.20
Acenaphthylene		0.27	0.27	WS4 – 1.10 – 1.20
Acenaphthene		0.23	0.23	WS4 – 1.10 – 1.20
Fluorene		0.42	0.21 – 0.42	WS4 – 1.10 – 1.20
Phenanthrene		2.90	0.23 – 2.90	WS4 – 1.10 – 1.20
Anthracene		0.85	0.11 – 0.85	WS4 – 1.10 – 1.20
Fluoranthene		4.50	0.30 – 4.50	HP5 – 0.25 – 0.40
Pyrene		3.70	0.31 – 3.70	WS4 – 1.10 – 1.20
Benzo(a)anthracene		2.10	0.30 – 2.10	HP5 – 0.25 – 0.40
Chrysene		1.90	0.28 – 1.90	HP5 – 0.25 – 0.40
Benzo(b)fluoranthene		2.50	0.40 – 2.50	HP5 – 0.25 – 0.40
Benzo(k)fluoranthene		0.76	0.14 – 0.76	HP5 – 0.25 – 0.40
Benzo(a)pyrene		1.60	0.36 – 1.60	HP5 – 0.25 – 0.40
Indeno(1,2,3-cd)pyrene		1.30	0.24 – 1.30	HP5 – 0.25 – 0.40
Di-benzo(a.h.)anthracene		0.43	0.21 – 0.43	HP5 – 0.25 – 0.40
Benzo(g,h,i.) Perylene		1.70	0.28 – 1.70	HP5 – 0.25 – 0.40

Total speciated TPH concentrations were mostly reported below 1000mg/kg. Four samples were reported with concentrations of total speciated TPH above 1000mg/kg. Three of these samples were taken from WS2 (0.10-0.30m bgl, 1.00-1.20m bgl and 2.60-2.90m bgl). The other samples were taken from WS1 – 0.10-0.30m bgl.

The highest total speciated TPH concentrations coincide with olfactory evidence of contamination and PID readings reported in WS2, where hydrocarbon and organic odours were noted along with PID readings up to 28.8ppm.

Tarmac was observed in Made Ground where samples were reported with the highest concentrations of speciated PAHs. Therefore, it is possible the source of the PAHs is tarmac. However, it cannot be discounted the source of the PAHs is from residual leaks and spills from vehicles or historical land uses.

Asbestos Containing Materials

Twelve samples of Made Ground were screened for the presence of asbestos. Asbestos was identified in seven samples. The samples identified containing asbestos, the asbestos type and concentration in the sample are as follows:

- BH1 – 0.60 – 0.80m bgl. Chrysotile loose fibres: <0.001%;
- BH1 – 1.00 – 1.20m bgl. Chrysotile loose fibres: <0.001%;
- BH1 – 2.40 – 2.60m bgl. Chrysotile hard/cement type material and loose fibres: 0.027%;
- BH2 – 0.50 – 0.70m bgl. Chrysotile loose fibres: <0.001%;
- BH3 – 0.30 – 0.50m bgl. Chrysotile loose fibres: <0.001%;
- HP5 – 0.25 – 0.40m bgl. Chrysotile and amosite loose fibres: 0.001%;
- HP5 – 0.80 – 1.00m bgl. Chrysotile and amosite loose fibrous debris and sheeting/board debris: 0.008%.

The primary risk from asbestos containing material is from disturbance, fibre release then inhalation.

Development plans show locations of BH1, BH2 and BH3 are covered by buildings and therefore the potential contaminant pathway would be broken. Location HP5 is in part of a new public realm. Should the public realm comprise soft landscaping, a certified clean capping layer would be required to break the potential contaminant linkage between asbestos and future Site users.

Notwithstanding the locations of identified asbestos in soils, the potential exists for asbestos to be present in areas of the Site not covered by this investigation. Therefore, it would be prudent for all proposed areas of soft landscaping in future development on-Site to comprise certified clean capping layer.

10.1.2 Off-site users

Potential risks to off-site users from asbestos in Made Ground include inhalation of contaminated dusts during groundworks. These risks can be mitigated using standard techniques employed during construction works such as dust suppression, dampening down of exposed surfaces and covering of stockpiles. These measures would typically be implemented and managed through a Construction Environmental Management Plan (CEMP).

10.2 Ground Gas and Vapours

10.2.1 Ground Gas

Guidance in BS8485:2015 has been used to derive a preliminary gas screening value (GSV). The GSV is then used to select an appropriate Characteristic Situation (CS) for design and selection of the choice of ground gas protective measures.

The borehole flow rate Q_{hg} (in L/h) has been calculated for each monitoring location (for each hazardous gas) using the following equation:

$$Q_{hg}=q (C_{hg}/100)$$

Where: -

Q_{hg} is the borehole hazardous gas flow rate

q is the measured flow rate (in litres per hour) of combined gases from the monitoring standpipe

C_{hg} is the measured hazardous gas concentration (in % volume/volume).

The results are summarised in Table 13

Table 13: Borehole hazardous gas flow rates

Monitoring Well	Response Zone	Q_{hg} (L/hr)	
		Round 1	
		Methane	Carbon Dioxide
BH1	Taplow Gravel Member/London Clay Formation	0.0001	0.0002
BH2	Taplow Gravel Member	0.0003	0.0009
BH3	Made Ground	0.0001	0.0024
WS1	Made Ground/Taplow Gravel Member	0.0001	0.0003
WS2	Made Ground/pond sediment/ London Clay Formation	0.0001	0.0008
WS3	Made Ground/Taplow Gravel Member	0.0003	0.0003

The maximum Q_{hg} value is 0.0001L/hr for methane and 0.0024L/hr for carbon dioxide. The higher of these values, 0.0024L/hr, is used as the preliminary gas screening value (GSV). A maximum steady flow rate of 0.1L/hr was used for this calculation.

BS 8485:2015 recommends a worst-case check for a temporally and spatially limited dataset. In this case, the worst case Q_{hg} is 0.0072L/hr, which is calculated by multiplying the highest flow rate (0.3L/hr) by the highest carbon dioxide concentration (2.4%) recorded during monitoring then dividing by one-hundred.

The ground gas monitoring results indicate the Site would be classified as a Characteristic Situation 1 (CS-1) – Very low risk. For a CS-1 site, a minimum gas protection score of 0 is required and ground gas protection measures are not required. However, the assessment above is preliminary. The data is spatially and temporally limited and additional monitoring visits and assessment would be required in accordance with BS 8485:2015. Further monitoring would likely comprise six visits over a period of 12 weeks, including periods of low and falling pressure.

The Site has been identified as being in a non-Radon affected area. However, current advice from the HPA is that all new buildings should include basic radon protective measures as a minimum whether they are in a radon affected area or not.

10.2.2 Vapours

Recorded VOC concentrations from soil headspace testing ranged from <0.1ppm to 28.8ppm. Most VOC concentrations from headspace testing were below the instruments limit of detection (<0.1ppm). The maximum concentration was recorded in WS2 in a sample of Made Ground taken 1.00 to 1.20m bgl. A concentration of 22.8ppm was also reported in a sample taken 2.60 to 2.90m bgl from WS2.

VOC concentrations recorded during vapour monitoring ranged from 0.4ppm in BH3 to 19.1ppm in BH2.

VOCs were reported above the laboratory limit of detection in one sample (WS2 – 2.60 – 2.90m bgl). VOC concentrations were below the available GAC. The following VOCs and concentrations were reported:

- Isopropylbenzene: 0.0057mg/kg (GAC = 12mg/kg);
- 1,3,5-Trimethylbenzene: 0.015mg/kg;
- 1,2,4-Trimethylbenzene: 0.022mg/kg (GAC = 0.41mg/kg); and
- sec-Butylbenzene: 0.0085mg/kg.

Several VOC TICS were identified in WS2 – 1.00 – 1.20m bgl and in WS2 – 2.60 – 2.90m bgl. Details of VOC TICS are included in laboratory certificates included in Appendix F.

SVOCs reported above the laboratory limit of detection were mainly the 17 speciated PAHs. However, 2-Methylnaphthalene was reported in WS2 – 1.00 – 1.20m bgl (2.0mg/kg), WS2 – 2.60 – 2.90m bgl (2.4mg/kg) and WS4 – 1.10 – 1.20m bgl (0.7mg/kg).

Numerous SVOC TICS were identified in WS2 – 1.00 – 1.20m bgl, WS2 – 2.60 – 2.90m bgl, HP5 – 0.25 – 0.40m bgl and WS1 – 1.50 – 1.80m bgl. Details of SVOC TICS are included in laboratory certificates included in Appendix F.

Screening of groundwater analysis against the SoBRA derived GAC_{GWVAP} for residential end-use reported a single exceedance of the GAC_{GWVAP} for Aliphatic TPH C10-C12. Aliphatic TPH C10-C12 in water sampled WS2 had a reported concentration of 310ug/l against a GAC_{GWVAP} of 37ug/l.

Soils, vapour and groundwater analysis indicate a significant vapour regime is not present across the Site. However, hydrocarbon impacted soils and groundwater around WS2 could be acting as a localised source of vapour and may require further investigation and mitigation as part of redevelopment works. Further investigation could include delineation of hydrocarbon contamination, collection of additional groundwater samples and vapour samples. Mitigation could include use of vapour protection measures in the development and/or source removal.

10.2.3 Off-site Users and Structures

Preliminary data indicates a significant ground gas and vapour regime does not exist at the Site. However, chemical analysis indicates residual contamination is present in groundwater. In consideration of a discontinuous groundwater body, the absence of permeable superficial deposits in the south and absence of a significant ground gas a vapour regime at the Site, potential risks to off-site users and structures from off-site migration of contamination, ground gas and vapours are low.

Further monitoring would be required to confirm the findings of the assessment and identify if mitigation measures protective of off-site receptors are required with respect ground gas and vapours.

10.3 Risk to Controlled Waters

Laboratory results from recovered groundwater samples, and the leachate analysis from BH1, have been assessed against EQS – Freshwater and EQS_{bioavailable}. Where EQS values were not available, assessment against DWS has been undertaken.

Three groundwater samples and a sample of leachate from BH1 were scheduled for a suite of analysis comprise inorganic and inorganic contaminants. The analysis reported slightly elevated concentrations of

cadmium, cobalt, manganese and fluoranthene in WS2 and a slightly elevated concentration of selenium in WS1. Elevated concentrations of speciated TPH were reported in WS2.

Exceedances of EQS and DWS in Area A are summarised in Table 14.

Table 14: Summary of generic quantitative risk assessment for controlled waters

Contaminant	Generic Assessment Criteria (ug/l) (EQS unless stated)	Number of Exceedances	Location(s)	Exceedance Concentration (ug/l)	Sampling Date
Dissolved Cadmium	0.25	1	WS2	0.46	20.11.2018
Dissolved Cobalt	3	1	WS2	3.5	20.11.2018
Dissolved Selenium	10 (DWS)	1	WS1	22	20.11.2018
Dissolved Manganese	599.37 (EQS _{bioavailable})	1	BH2	830	20.11.2018
Fluoranthene	0.0063	1	WS2	0.29	20.11.2018
Aliphatic TPH C10-C12	300 (DWS)	1	WS2	310	20.11.2018
Aliphatic TPH C12-C16	300 (DWS)	1	WS2	590	20.11.2018
Aromatic TPH C10-C12	90 (DWS)	1	WS2	170	20.11.2018
Aromatic TPH C12-C16	90 (DWS)	1	WS2	410	20.11.2018
Aromatic TPH C16-C21	90 (DWS)	1	WS2	340	20.11.2018

Chemical analysis indicates residual contamination is present in groundwater and perched water at the Site. However, in consideration of discontinuous groundwater at the Site, the absence of permeable superficial deposits in the south, distance to surface water bodies and extent of buildings and hardstanding cover as part of the Development, the potential risk to the Taplow Gravel Member Principal Aquifer from leaching and lateral migration of contamination is low.

Where hydrocarbon contamination is present, this will need to be appropriately managed during excavation works. Where dewatering of excavations is required, pockets of water may require treatment to lower TPH concentrations if disposal to sewer under a discharge consent is to be undertaken.

A Foundation Works Risk Assessment (FWRA) may be required by London Borough of Hounslow/Environment Agency to assess risks to the Taplow Gravel Member Principal Aquifer from the preferred piling methodology for the Development. The FWRA would be required to demonstrate mitigation measures protecting underlying groundwater from any residual contamination in soils and groundwater from piling activities.

10.4 Risk to Ecological Systems/Vegetation

Laboratory results have been assessed against the criteria given in BS3882: 2015 Specification for Topsoil. A screen of the copper, nickel and zinc results against the assessment criteria did not identify any exceedances.

Imported topsoil/subsoil should be assessed for its suitability for use. In order to assess the suitability of imported soil the full range of analysis specified in BS3882: 2015 and BS8601:2013 should be undertaken by an appropriately qualified specialist. Imported topsoil should also be protective of human health.

10.5 Risk to Water Supply Pipes and other Buried Infrastructure

The UKWIR project steering group decided that barrier pipes would provide sufficient protection for the supply of drinking water in all Brownfield site conditions. However, this approach needs to be agreed with the local water company.

Risks to buried concrete from aggressive ground conditions and chemical attack can be mitigated by designing concrete in accordance with BRE Special Digest 1 (2005), 3rd Edition (BRE-SD1), entitled *Concrete in aggressive ground*, which provides guidance on the specification for concrete for installation in natural ground and in brownfield locations.

Chemical analysis indicates residual contamination is present in groundwater and perched water at the Site. However, in consideration of a discontinuous groundwater body at the Site and the absence of permeable superficial deposits in the south, potential risks to off-site structures from off-site migration of contamination are low.

10.6 Risk to Construction Workers

Potential pathways between contaminants in soils and groundwater and construction workers/ ground workers include direct contact, inhalation, and ingestion. However, exposure to contamination would be short-term. There is also the risk of disturbance of potential ACMs and inhalation of asbestos fibres.

Depleted oxygen levels were recorded in all monitoring wells. A minimum oxygen concentration of 0.4% was recorded in BH2. A peak carbon dioxide concentration of 2.4% was also recorded in BH2. Methane was not recorded above the instrument's limit of detection (<0.1%). Hydrogen sulphide was also not recorded above the instrument's limit of detection (<1ppm). A maximum carbon monoxide concentration of 12ppm was recorded in BH2. A peak VOC concentration of 19.1ppm was recorded in BH2.

To mitigate the occupational risks to construction workers and groundworkers from depleted oxygen levels, ground gases and vapours appropriate PPE and if necessary RPE would be required during any below ground works and the requirements included within the Confined Space Regulations 1997 should be adhered to. Mandatory health and safety requirements under the Construction, Design and Management (CDM) Regulations 2015 and Control of Substances Hazardous to Health (COSHH) Regulations 2002 and Control of Asbestos Regulations 2012 would also require adherence.

11. Preliminary Geotechnical Assessment

Development proposals will comprise a residential-led scheme including:

- Building heights ranging up to seventeen storeys
- Proposed lower ground floor will extend below the building to about 13.4m AOD (up to about 3 to 6.5m below existing Site levels of about 17 to 20m AOD).
- Development proposals do not include private gardens, but areas of soft landscaping may be included consisting of communal grassland, planters and tree pits and podium gardens.

As this development comprises multi-storey buildings, it is recommended that a pile foundation solution be considered with the loads being transmitted to the London Clay. Indicative resistances of a single bored pile at varying depths and diameters in London Clay, based on previous sites in similar conditions, is presented in Table 15 below **but should not be relied upon for design.**

Table 15: Indicative pile capacities

Estimated Pile Resistance (bored pile) kN				
Pile Length (m below cut-off level)	750mm	900mm	1050mm	1200mm
5	425	550	700	850
10	825	1000	1250	1500
20	1850	2300	2800	3300
30	3250	4000	4800	5600
40	3850	5550	7200	8400

These estimates should be confirmed upon completion of a detailed ground investigation and suitable suite of geotechnical laboratory testing including BRE SD1 testing as London Clay is well known to contain pyrite.

The final design of the piles will be the responsibility of the piling contractor. The carrying capacity of the actual pile groups will in part depend on the number, type and size of pile chosen by the contractor and the quality of workmanship. The piles should be designed based on the requirements of Eurocode 7.

11.1 Floor Slabs

Due to the anticipated depth of the lower ground floor (circa 3m to 6.5m bgl) it is likely that ground bearing floor slabs can be adopted in the design as they will be founded on a blinding layer on the London Clay. This should be considered in conjunction with the wider foundation design strategy, accounting for the likelihood of piled foundations. The design of the slabs should only be finalised on completion of a gas monitoring assessment in order to allow for the incorporation of gas protection measures (if any).

11.2 Groundwater/Stability of Excavations

The redevelopment operations are likely to include shallow (<1.2m) and deep excavations (up to 6.5m bgl) associated with service runs, lower ground floor and piling. Based on observations made during fieldwork, shallow excavations are likely to be stable in the short term.

During the preliminary ground investigation, groundwater was not encountered. Groundwater monitoring has been recorded at a minimum depth of 0.90m bgl in WS1. It is possible that perched water may be present, and that groundwater levels are likely to fluctuate dependent on the time of year and prevailing weather conditions. Until additional monitoring data is received, it is suggested that groundwater level for design purposes is considered to be 0.90m bgl. However, this level is subject to revision on receipt of further data.

Given the lower ground floor excavation depths groundwater control may be required during construction and permanent design works to maintain a dry and stable environment. Appropriate dewatering measures employed should be in accordance with relevant guidance such as CIRIA Report C750, Groundwater control: design and practice, second edition (2016).

Groundwater inflow to excavations may promote instability and temporary works measures should include an allowance for groundwater control. In addition, pockets of perched groundwater and unstable materials in other areas of the Site which have not been investigated cannot be entirely discounted. In line with BS:6031 (2009), all excavations should be examined daily by a competent person to ensure that they remain safe and stable.

Where the sides cannot be graded back to a safe angle, as approved by a competent and experienced person, their continued stability should not be taken for granted. All excavations of greater than 1.2m depth requiring man entry must be provided with a suitably designed shoring support system. For excavations of over 0.90m depth, groundwater control in the form of excavation of sumps and pumping to agreed discharge points may be required.

12. Revised Conceptual Model

Following assessment of data gathered from the ground investigation, the contaminant linkages identified in the outline conceptual model have been re-evaluated and reclassified in relation to the information obtained

The results of the reassessment are summarised in Table 16:

Table 16: Revised conceptual model for the Site

Receptor	Potential Sources	Pathways	Preliminary Risk	Justification / Mitigation	Residual Risk
Human Health					
	Contaminated Made Ground	Direct contact, inhalation and ingestion	Medium	<p>One sample of Made Ground at exploratory hole location HP5 exceeded the GAC for dibenzo(ah)anthracene. Laboratory screening of Made Ground samples also identified seven samples containing asbestos. These samples were taken from four exploratory hole locations (BH1, BH2, BH3 and HP5).</p> <p>The majority of the proposed development comprises buildings and hardstanding which would break the potential contaminant pathways to future Site users. However, where soft landscaping is included in the development clean capping layers could be used to break the potential contaminant pathways.</p>	Low
Future Site Users	Ground gas and vapours from organic constituents and volatile compounds in Made Ground, volatile compounds in shallow groundwater	Ingress into structures, accumulation, inhalation, risk of asphyxiation and potential for explosion	Medium	<p>Preliminary ground gas monitoring indicates a significant ground gas regime does not exist at the Site and the Site would be classified as a Characteristic Situation 1 (CS-1) – Very low risk. Based on this preliminary assessment ground gas protection measures are unlikely to be required.</p> <p>Further monitoring would be required to confirm the findings of the preliminary assessment. Should further monitoring identify a ground gas risk, appropriate gas protection measures should be incorporated into the development to mitigate the risk.</p> <p>Soils, vapour and groundwater analysis indicate a significant vapour regime is not present across the Site. However, localised hydrocarbon impacted soils and groundwater could be acting as a source of vapour and may require further investigation and mitigation as part of redevelopment works. Further investigation could include delineation of hydrocarbon contamination, collection of additional groundwater samples and vapour samples. Mitigation could include use of vapour protection measures in the development and/or source removal.</p>	Low
Off-site residents/users	Contaminated Made Ground	Dust generation during ground works, inhalation by off-site users	Medium	<p>Dust potentially containing contaminants may be generated and blown off-site during ground works</p> <p>The implementation of a Construction Environmental Management Plan (CEMP), including techniques for suppressing dust and handling and storage of fuels and hazardous substances, would mitigate potential risks to off-site users from contaminated dust.</p>	Low

Receptor	Potential Sources	Pathways	Preliminary Risk	Justification / Mitigation	Residual Risk
	Ground gas and vapours from organic constituents and volatile compounds in Made Ground, volatile compounds in shallow groundwater	<p>Off-site migration of contaminants via groundwater flow through permeable strata, ingress of vapours into off-site structures.</p> <p>Off-site migration of ground gas through permeable strata, ingress of ground gases into off-site structures.</p> <p>Inhalation, risk of asphyxiation and potential for explosion.</p>	Medium	<p>Preliminary data indicates a significant ground gas and vapour regime does not exist at the Site. However, hydrocarbon impacted soils and groundwater around WS2 could be acting as a localised source of vapour and may require further investigation and mitigation as part of redevelopment works.</p> <p>In consideration of discontinuous groundwater at the Site and the absence of permeable superficial deposits in the south, potential risks to off-site users from off-site migration of contamination, ground gas and vapours are low.</p> <p>Further monitoring would be required to confirm the findings of the assessment and identify if mitigation measures protective of off-site receptors are required with respect ground gas and vapours.</p>	Low
Construction Workers	Contaminated shallow soils and groundwater	Direct contact, inhalation and ingestion	Medium	<p>Ground workers will need to be provided with appropriate Personal and Respiratory Protective Equipment (PPE/RPE) and adopt good hygiene standards.</p> <p>Laboratory analysis identified the presence of asbestos in soils at four exploratory hole locations.</p> <p>Construction workers and ground workers should be asbestos awareness trained. If asbestos is encountered during redevelopment works a Control of Asbestos Regulations (CAR) 2012 asbestos management plan should be implemented.</p>	Low
	Ground gas and vapours from organic constituents and volatile compounds in Made Ground, volatile compounds in shallow groundwater	Inhalation within confined spaces, risk of asphyxiation and explosions	Medium	<p>Depleted oxygen levels were recorded in all monitoring wells. Detectable concentrations of vapours, carbon dioxide and carbon monoxide were also recorded in monitoring wells.</p> <p>Construction workers and ground workers should avoid entering excavations. If entry cannot be avoided, a risk assessment should be undertaken with PPE and RPE used where appropriate. Confined space entry should be carried out in line with the Confined Space Entry Regulations 1997.</p>	Low
Property					
On-Site structures	Contaminated soils and groundwater	<p>Direct contact. Chemical attack on buried services and structures.</p> <p>Contamination of drinking water supply.</p>	Medium	<p>Barrier pipes would provide sufficient protection for drinking water supply pipes. This approach would need to be agreed with the local water company.</p> <p>Risks to buried concrete from aggressive ground conditions and chemical attack can be mitigated by designing concrete in accordance</p>	Low

Receptor	Potential Sources	Pathways	Preliminary Risk	Justification / Mitigation	Residual Risk
				with BRE Special Digest 1 (2005), 3rd Edition (BRE-SD1), entitled Concrete in aggressive ground, which provides guidance on the specification for concrete for installation in natural ground and in brownfield locations.	
	Ground gas and vapours from organic constituents and volatile compounds in Made Ground, volatile compounds in shallow groundwater	Ground gas / vapour ingress and accumulation within structures, leading to potential explosion	Medium	<p>Preliminary ground gas monitoring indicates the Site to be classified as a Characteristic Situation 1 (CS-1) – Very low risk. For a CS-1 site, a minimum gas protection score of 0 is required and ground gas protection measures are not necessary.</p> <p>Further monitoring would be required to confirm the findings of the preliminary assessment. Should further monitoring identify a ground gas risk, appropriate gas protection measures should be incorporated into the development to mitigate the risk.</p> <p>Soils, vapour and groundwater analysis indicate a significant vapour regime is not present across the Site. However, hydrocarbon impacted soils and groundwater around WS2 could be acting as a localised source of vapour and may require further investigation and mitigation as part of redevelopment works.</p> <p>Further investigation could include delineation of hydrocarbon contamination, collection of additional groundwater samples and vapour samples. Mitigation could include use of vapour protection measures in the development and/or source removal.</p>	Low
	Contaminated groundwater	Off-site migration of contamination by groundwater flow resulting in direct contact with off-site structures	Medium	Chemical analysis indicates residual contamination is present in groundwater and perched water at the Site. However, in consideration of likely discontinuous groundwater at the Site and the absence of permeable superficial deposits in the south, potential risks to off-site structures from off-site migration of contamination in groundwater are low.	Low
Off-site structures	Ground gas and vapours originating from Made Ground and shallow soils	<p>Off-site migration of ground gas and vapours through permeable strata</p> <p>Ingress of ground gas and vapours into off-site structures. Risk of explosion</p>	Medium	<p>Preliminary data indicate a significant ground gas and vapour regime does not exist at the Site. However, hydrocarbon impacted soils and groundwater around WS2 could be acting as a localised source of vapour and may require further investigation and mitigation as part of redevelopment works. In consideration of likely discontinuous groundwater at the Site and the absence of permeable superficial deposits in the south, potential risks to off-site structures from off-site migration of ground gas and vapours are low.</p> <p>Further monitoring would be required to confirm the findings of the assessment and identify if mitigation measures protective of off-site receptors are required with respect ground gas and vapours.</p>	Low

Receptor	Potential Sources	Pathways	Preliminary Risk	Justification / Mitigation	Residual Risk
Ecological Systems					
Soft landscaping	Contaminants in soils and shallow groundwater	Direct contact. Root uptake	Medium	<p>No exceedances of potentially phytotoxic contaminants have been recorded in soils.</p> <p>Imported topsoil/subsoil should be assessed for its suitability for use. In order to assess the suitability of imported soil the full range of analysis specified in BS3882: 2015 and BS8601:2013 should be undertaken by an appropriately qualified specialist. Imported topsoil should also be protective of human health.</p>	Low
Controlled Waters					
Taplow Gravel Member - Principal Aquifer	Contaminants in soils and shallow groundwater	Leaching into groundwater. Lateral migration. Preferential pathways created by piling activities.	Medium	<p>Chemical analysis indicates residual contamination is present in groundwater and perched water at the Site. However, in consideration of discontinuous groundwater at the Site, the absence of permeable superficial deposits in the south, distance to surface water bodies and extent of buildings and hardstanding cover as part of the Development, the potential risk to the Taplow Gravel Member Principal Aquifer from leaching and lateral migration of contamination is low.</p> <p>A FWRA may be required by London Borough of Hounslow/Environment Agency to assess risks to the Taplow Gravel Member Principal Aquifer from the preferred piling methodology for the Development. The FWRA would be required to demonstrate mitigation measures protecting underlying groundwater from any residual contamination in soils and groundwater from piling activities.</p>	Low

13. Conclusions and Recommendations

13.1 Conclusions

On the basis of the information obtained from the intrusive investigation the Site is considered to represent a **medium** risk.

The risk rating is based on the following:

- Widespread significant contamination of soils and groundwater has not been identified. However, collection of soil data in the footprint of the Homebase store has not been possible. Therefore, it cannot be discounted contamination exists in soils in areas not yet investigated and requirement for remediation of groundwater and soil also cannot be ruled out;
- A residual slightly elevated concentration of dibenzo(ah)anthracene was reported and asbestos was reported in soils at four exploratory hole locations. However, a certified clean capping layer or hardstanding would break the potential contaminant linkages between these contaminants and future Site users;
- Chemical analysis indicates residual contamination is present in groundwater and perched water at the Site. Elevated concentrations of speciated TPH were reported in a groundwater sample recovered from WS2 in the south;
- Hydrocarbon impacted soils and groundwater around WS2 could be acting as a localised source of vapour and may require further investigation and mitigation as part of redevelopment works.

The potential pollutant linkages can be managed by design of appropriate mitigation measures during the redevelopment of the Site. Following the implementation of the recommendations, post development, the Site would be of **low** risk and should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990 and the requirements of the NPPF would be met.

13.2 Earthworks and Construction Considerations

- Buried obstructions may be widespread across the Site and are likely to consist of relic footings and foundations of previous Site uses (including Isleworth Winery and unspecified industrial structures and works) and the existing foundations of the Homebase store;
- There is potential for buried tanks and associated infrastructure to be encountered during earthworks which may contain residual quantities of fuel;
- Uncontaminated concrete may be recovered for reuse on-Site subject to compliance with the WRAP Quality Protocol for Production of Aggregates from Inert Waste or recovered as inert waste subject to acceptance at an appropriately permitted facility;
- Soils in locations where samples reported speciated TPH concentrations >1000mg/kg, including soil samples at WS1 and WS2 may be hazardous for waste disposal purposes. Sampling and assessment of waste soils in accordance with EA guidance documentation will be required to confirm this;
- Where hydrocarbon contamination in groundwater is present, this will need to be appropriately managed during excavation works. Where dewatering of excavations is required, pockets of water may require treatment to lower TPH concentrations if disposal to sewer under a discharge consent is to be undertaken;

- Removal of soils from the Site can be minimised by their reuse on Site to facilitate filling where required provided they are chemically and geotechnically suitable. Any re-use of soils on Site should be in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice (DoWCoP), subject to appropriate sampling and testing, risk assessment and compliance with the requirements of the DoWCoP;
- All site works will need to be managed to prevent contamination or pollution of the Taplow Gravel Member Principal Aquifer. Measures include containment of fuels, oils and other hazardous substances in suitably bunded facilities, monitoring of these facilities, control of refuelling activities, spill response procedures, control of all discharges, management of run off from work areas and compounds;
- A Foundation Works Risk Assessment (FWRA) may be required by London Borough of Hounslow/ Environment Agency to demonstrate mitigation measures to protect underlying groundwater from any residual contamination in soils and groundwater from piling activities;
- Potential risks to construction workers and ground workers can be mitigated by the use of standard health and safety measures including PPE and if necessary RPE and conformance with the Confined Space Regulations 1997, Construction, Design and Management (CDM) Regulations 2015, Control of Substances Hazardous to Health (COSHH) Regulations 2002 and Control of Asbestos Regulations 2012;
- The potential for UXO at the Site cannot be discounted. A detailed UXO desk study should be undertaken and its findings and recommendations considered during subsequent intrusive Site works;
- Fuel and hazardous substance storage should be in accordance with the Control of Pollution (Oil Storage Regulations (England) 2001 and COSHH Regulations 2002 respectively. Bulk storage of fuel should only be permitted in double skinned tanks (integrally bunded).

13.2.1 Asbestos Containing Materials

Asbestos in Made Ground is not unexpected for post-industrial sites. The source of asbestos in Made Ground is typically historical demolition of buildings constructed before 1999 when the Asbestos (Prohibitions) (Amendment) Regulations 1999 came into force.

Asbestos was reported in soils at four exploratory hole locations. Reported concentrations ranged from <0.001% (below the laboratory limit of detection) to 0.027%. Asbestos visible to the naked eye was not observed in soils. However, the potential for some waste soils to be classified as hazardous waste for disposal purposes should be considered.

The hazardous waste threshold for the presence of asbestos in soils (where asbestos is not visible to the naked eye) is 0.1%. Whilst none of the screened samples exceeded this threshold, the presence of degraded ACMs at the microscopic level can be indicative of larger ACMs visible to the naked eye elsewhere in soils².

² As per Environment Agency Technical Guidance WM3 "Guidance on the classification and assessment of waste" (1st Edition v1.1 2018): If the waste contains any pieces of asbestos containing material that can be identified as potentially being asbestos containing materials by a competent person (if examined by the naked eye), then the pieces must be assessed separately. The waste is hazardous if the concentration of asbestos in the piece of asbestos containing material is 0.1% or more. The waste is regarded as a mixed waste and classified accordingly. The following codes should be assigned to the asbestos element of the waste as appropriate:

- 17 06 05* Construction material containing asbestos
- 17 06 01* Insulation material containing asbestos.

17 06 05* would normally be used in preference to 17 06 01* for the asbestos in asbestos contaminated soils and stones.

Visible ACM debris in waste soils, if present in discreet pockets, could be managed by hand picking to potentially reduce disposal costs by separating asbestos from the soil matrix. This will allow waste soil to have its own waste classification. This task could be non-licensed or licensed depending on the type of asbestos and its condition.

Construction workers should be asbestos awareness trained and an asbestos management plan, in accordance with Control of Asbestos Regulations 2012, prepared. This should include detailed risk assessments, provision of appropriate PPE and RPE, mitigation measures for dust generation and asbestos air monitoring.

13.3 Geotechnical

- As this development comprises multi-storey buildings and lower ground floor, it is recommended that a pile foundation solution be considered with the loads being transmitted to the London Clay. Indicative resistances of a single bored pile at varying depths and diameters in London Clay, based on previous sites in similar conditions, is presented in **Error! Reference source not found. but should not be relied upon for design.**

Table 17: Indicative pile capacities

Estimated Pile Resistance (bored pile) kN				
Pile Length (m below cut-off level)	750mm	900mm	1050mm	1200mm
5	425	550	700	850
10	825	1000	1250	1500
20	1850	2300	2800	3300
30	3250	4000	4800	5600
40	3850	5550	7200	8400

- These estimates should be confirmed upon completion of a detailed ground investigation and suitable suite of geotechnical laboratory testing including BRE SD1 testing as London Clay is well known to contain pyrite.
- The final design of the piles will be the responsibility of the piling contractor. The carrying capacity of the actual pile groups will in part depend on the number, type and size of pile chosen by the contractor and the quality of workmanship. The piles should be designed based on the requirements of Eurocode 7.
- The type of pile selected, and method of installation, requires careful consideration in relation to the potential to create a contamination pathway between shallow and deep aquifers, and may need agreement with the Environment Agency;
- Due to the anticipated depth of the lower ground floor (circa 3m to 6.5m bgl) it is likely that ground bearing floor slabs can be adopted in the design as they will be founded on a blinding layer on the London Clay. This should be considered in conjunction with the wider foundation design strategy, accounting for the likelihood of piled foundations. The design of the slabs should only be finalised on completion of a gas monitoring assessment in order to allow for the incorporation of gas protection measures (if any);

- Groundwater has been recorded at a minimum depth of 0.90m bgl in WS1. Until additional monitoring data is received, it is suggested that groundwater level for design purposes is considered to be 0.90m bgl. However, this level is subject to revision on receipt of further data.
- Given the lower ground floor excavation depths groundwater control may be required during construction and permanent design works to maintain a dry and stable environment. Appropriate dewatering measures employed should be in accordance with relevant guidance such as CIRIA Report C750, Groundwater control: design and practice, second edition (2016);
- Groundwater inflow to excavations may promote instability and temporary works measures should include an allowance for groundwater control. In addition, pockets of perched groundwater and unstable materials in other areas of the Site which have not been investigated cannot be entirely discounted. In line with BS:6031 (2009), all excavations should be examined daily by a competent person to ensure that they remain safe and stable;
- Where the sides cannot be graded back to a safe angle, as approved by a competent and experienced person, their continued stability should not be taken for granted. All excavations of greater than 1.2m depth requiring man entry must be provided with a suitably designed shoring support system. For excavations of over 1.20m depth, groundwater control in the form of excavation of sumps and pumping to agreed discharge points may be required.

13.4 Recommendations

13.4.1 Environmental

- The presence of asbestos in soils should be included in the Site's asbestos register;
- Consideration should be given to inaccessible areas of the Site during the ground investigation and uncertainties pertaining to the contamination status in these areas;
- Consideration should be given to potentially widespread buried obstructions across the Site, likely to consist of relic footings and foundations of previous Site uses (including Isleworth Winery and unspecified industrial structures and works) and the existing foundations of the Homebase store;
- A watching brief for buried tanks and associated infrastructure should be undertaken during earthworks. Any buried tanks and associated infrastructure encountered should be appropriately decommissioned and removed from Site. Any impacted soils and groundwater should be subject to risk assessment and, if found to pose an unacceptable risk to receptors, subject to remediation and/or removal;
- The potential for some soils to be classified as hazardous for waste disposal purposes should be considered. Additional exploratory holes and laboratory testing of soils around WS1 and WS2 are recommended to delineate the extent of hydrocarbon impacted soils and groundwater.
- Retention of groundwater and ground gas monitoring wells installed as part of this ground investigation to enable future monitoring of ground gas and groundwater;
- Detailed environmental and geotechnical ground investigation should be undertaken once the design of proposed development has been finalised. This should target areas of the Site not accessible during this ground investigation, including the footprint of the Homebase store. The presence of buried obstructions should also be investigated;
- Waste classification assessment of likely waste soil arisings should be undertaken as part of the detailed environmental and geotechnical ground investigation. Exploratory holes should target proposed lower ground floor excavation areas and where Site levels are to be reduced;
- Further environmental and geotechnical ground investigation should also include ground gas, vapour and groundwater monitoring and sampling of monitoring wells;
- Monitoring and assessment of the Site's ground gas and vapour regime should be in accordance with guidance CIRIA C665, CIRIA C682, BS8485: 2015 and BS8576: 2013. Monitoring would likely comprise six visits over a period of 12 weeks, including monitoring during periods of low and falling pressure;
- A Geo-Environmental Assessment report suitable for submission for planning should be prepared using all data obtained from the ground investigations;
- A detailed UXO desk study should be undertaken and its findings and recommendations considered during subsequent intrusive Site works;
- Preparation of a Remediation Strategy, based on the findings of the Geo-Environmental Assessment report, detailing how potentially unacceptable risks to identified receptors will be mitigated at part of the development and a Verification Report confirming the implementation of the mitigation measures. Both documents should be suitable for submission for planning;

- Imported topsoil/subsoil should be assessed for its suitability for use. In order to assess the suitability of imported soil the full range of analysis specified in BS3882: 2015 and BS8601:2013 should be undertaken by an appropriately qualified specialist. Imported topsoil should also be protective of human health.

13.4.2 Geotechnical

As this preliminary ground investigation provided limited geotechnical information, and the proposed development involves multi-storey buildings, additional ground condition information such as shear strength, groundwater level and porewater pressure is required.

To establish this information, a further ground investigation is required comprising boreholes to depths in the region of 40m bgl with associated in-situ testing, standpipe and piezometer installation; and geotechnical laboratory testing of recovered samples. Geotechnical interpretative reporting should include:

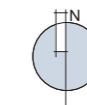
- Identification of suitable piling depths and founding stratum for shallow foundations;
- Geotechnical parameters for foundation and pavement design;
- Indicative bored pile estimates must be confirmed upon completion of final ground investigation;
- Establish aggressivity of the soils/bedrock in relation to buried concrete; and
- Establish groundwater levels and potential impact on foundations design and temporary works.



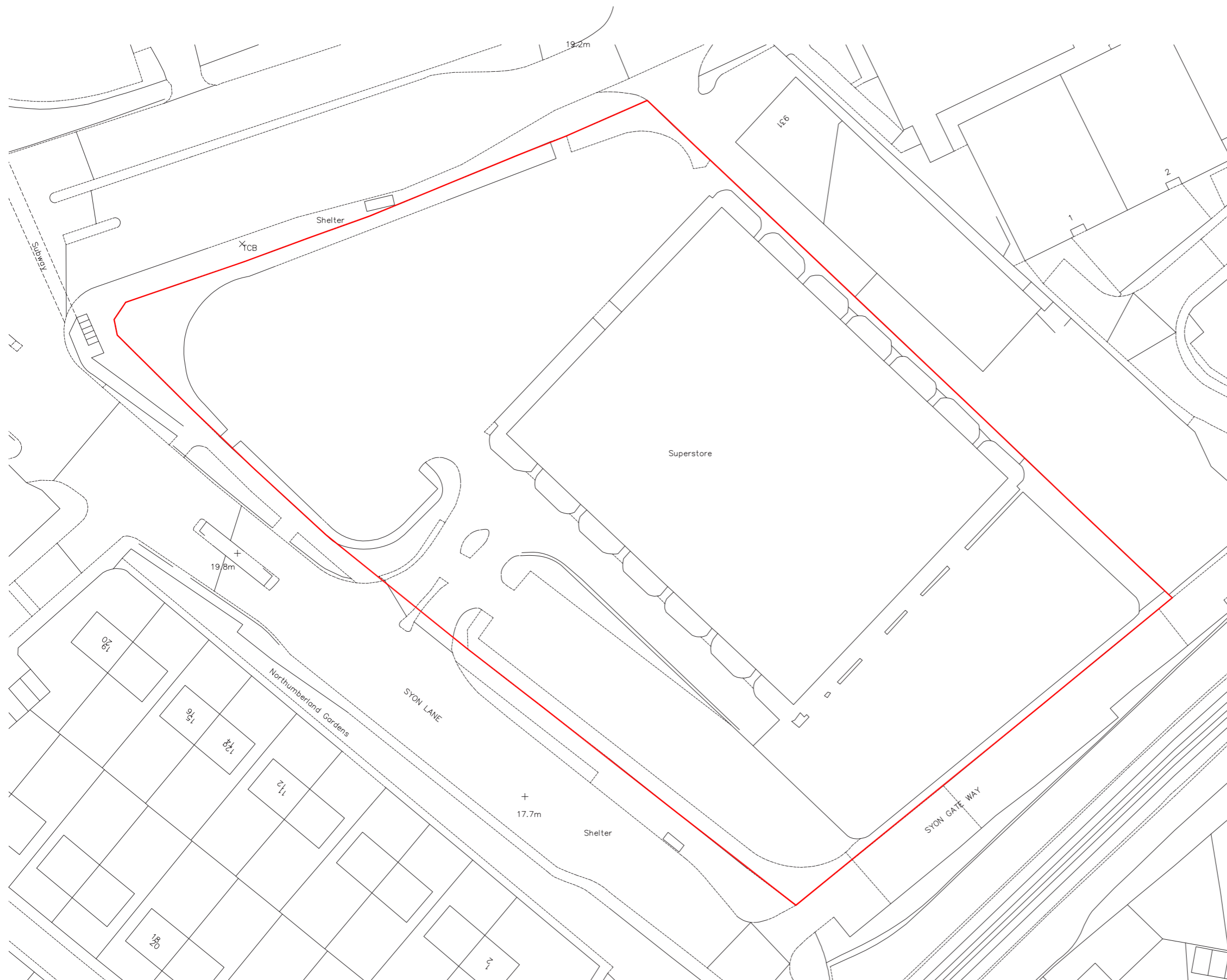
APPENDICES

Appendix A Site Plans

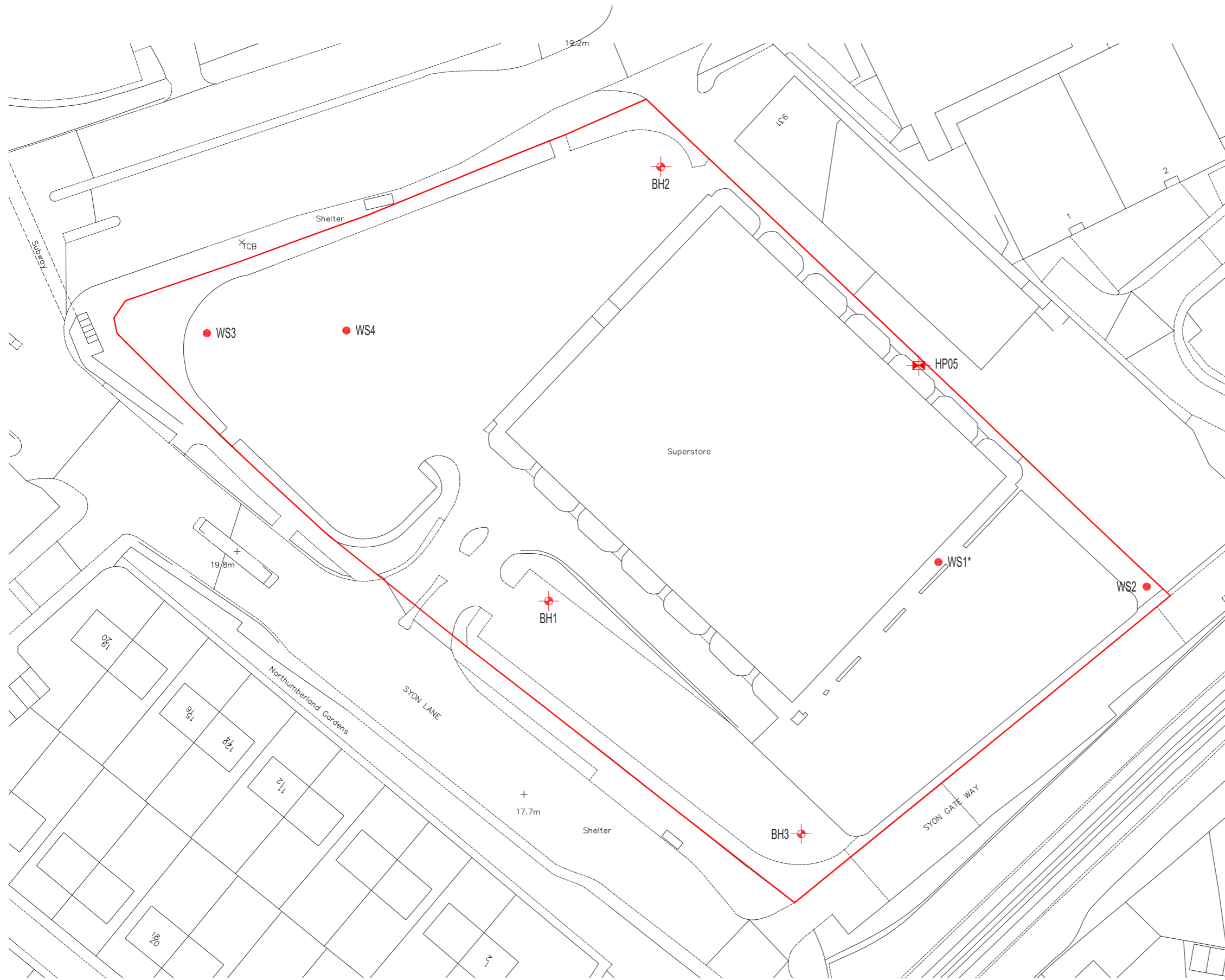
- **Site Location Plan**
- **Site Plan**
- **Ground Investigation Plan**
- **Conceptual Site Model**
- **Proposed Development Plans**





Project Details	WIE15238-100: Homebase, 67 Syon Lane
Figure Title	Figure A1: Site Location Plan
Figure Ref	WIE15238-100_GR_4GQRA_A1A
Date	November 2018
File Location	\\s-inc\wiel\projects\wie15238\100\graphics\4.gqra\issued figures

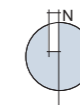


Project Details	WIE15238-100: Homebase, 67 Syon Lane
Figure Title	Figure A2: Site Boundary
Figure Ref	WIE15238-100_GR_4GQRA_A2A
Date	November 2018
File Location	\\s-inc\wiel\projects\wie15238\100\graphics\4.gqr\issued figures
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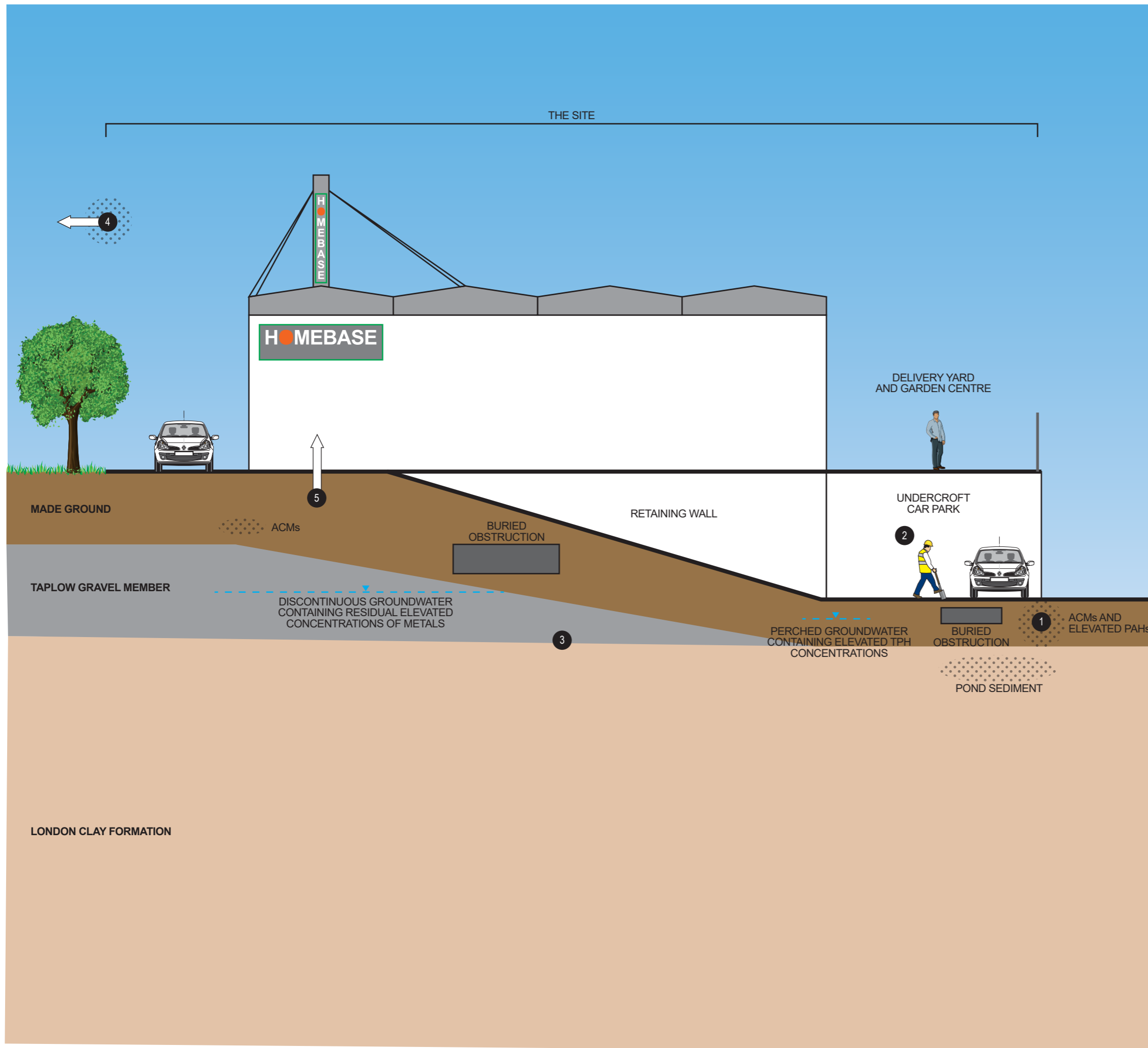


-  Site Boundary
-  Borehole Location
-  Window Sample Location
-  Hand Pit Location

* Position unable to be surveyed due to overhead obstructions

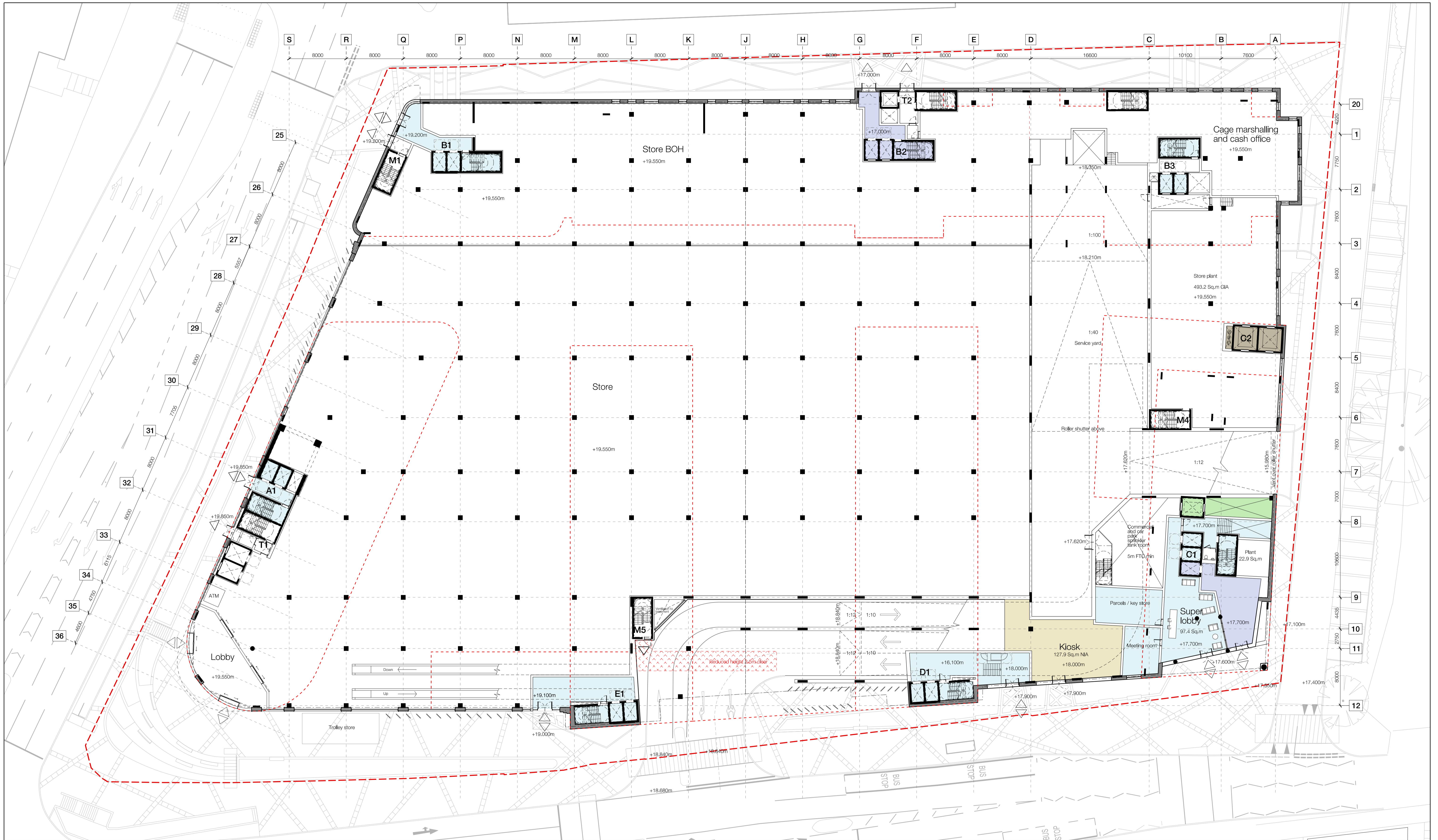


Project Details	WIE15238-100: Homebase, 67 Syon Lane
Figure Title	Figure A3: Ground Investigation Plan
Figure Ref	WIE15238-100_GR_4GQRA_A3A
Date	November 2018
File Location	\\s-incs\wie\projects\wie15238\100\graphics\4.gqr\issued figures



- 1 Risks to future site users: Disturbance and inhalation of asbestos in Made Ground. Direct contact, ingestion and inhalation of residual elevated concentrations of speciated PAHs.
- 2 Risk to construction workers: Direct contact, inhalation and ingestion of contaminants in shallow soils and groundwater. Inhalation of ground gases and vapours, risk of asphyxiation from depleted oxygen levels. Risk of explosion.
- 3 Risks to on-Site structures: Direct contact and chemical attack on buried services and structures from contamination in soils and groundwater. Contamination of drinking water supply.
- 4 Risks to off-site users: Dust generation during ground works and inhalation of contaminated dusts.
- 5 A significant ground gas and vapour regime at the Site has not been identified. However, this assessment is preliminary and further ground gas and vapour monitoring would be required to confirm these findings.

Project Details	WIE15238-100: Homebase, 67 Syon Lane
Figure Title	Figure A4: Conceptual Site Model
Figure Ref	WIE15238-100_GR_4GQRA_A4A
Date	November 2018
File Location	\\s-Incs\wiel\projects\wie15238\100\graphics\4.gqra\issued figures



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Title
General arrangement plan
Ground floor

Project
Syon Lane
Scale
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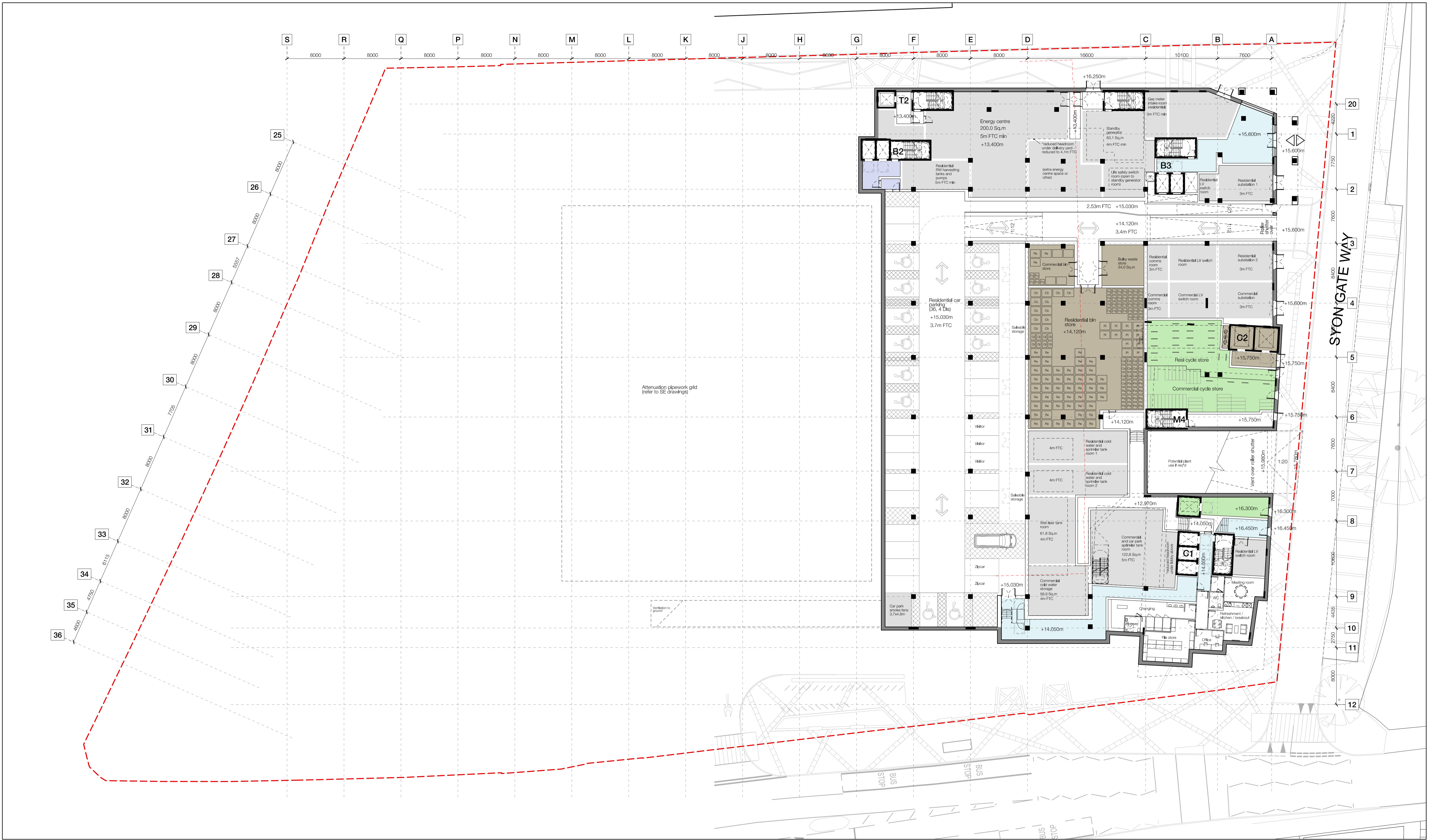
Issue Record	By	Chk	Date
P34 Planning Issue	MA	AC	27.08.2020
P33 For Information	TG	AC	24.08.2020
P32 Planning Issue	TG	AC	29.07.2020
P31 Planning Issue	TG	AC	28.07.2020
P30 Planning Issue	MA	AC	28.07.2020
P29 Planning Draft	TG	AC	17.07.2020

Drawing Number
579-PTA-ZZ-00-DR-A-1001
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Title
General arrangement plan
Lower ground floor

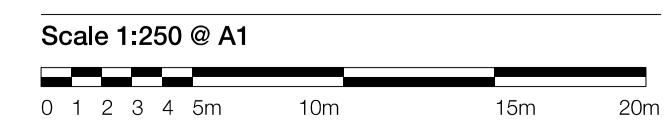
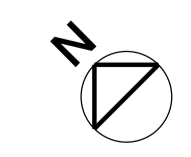
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Issue Record	By	Chk	Date
P25 Planning Issue	MA	AC	27.08.2020
P24 Updated block plans & B3 layouts	MP	AC	21.08.2020
P23 Planning Issue	MA	AC	28.07.2020
P22 Planning Draft	TG	AC	17.07.2020
P21 Design freeze 3	TG	AC	10.07.2020
P20 Design update Issue	TG	AC	01.07.2020

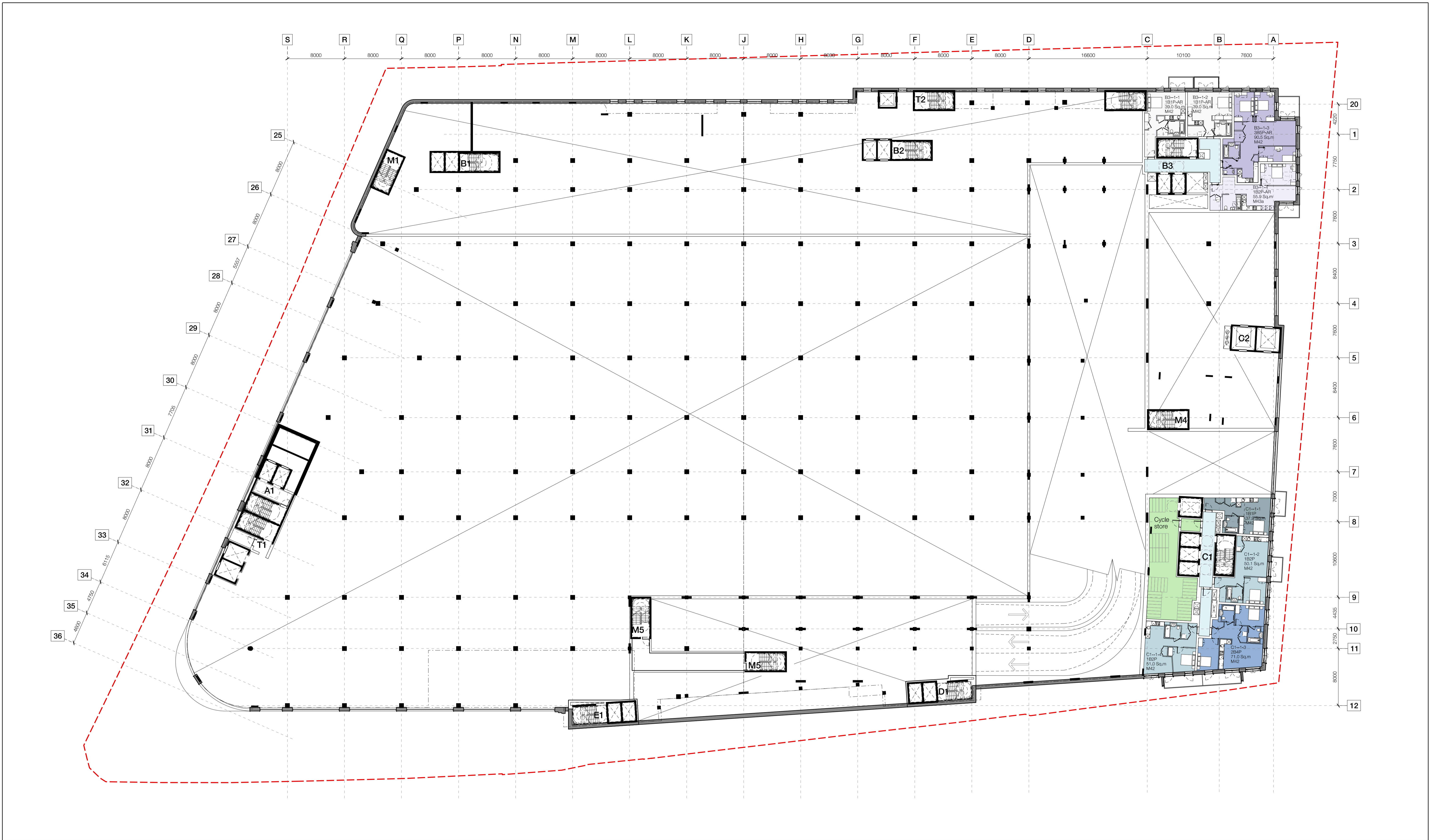
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P25

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Title
General arrangement plan
Upper ground floor

Project
Syon Lane

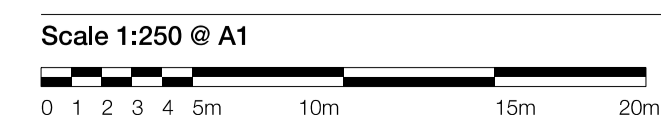
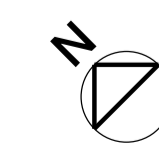
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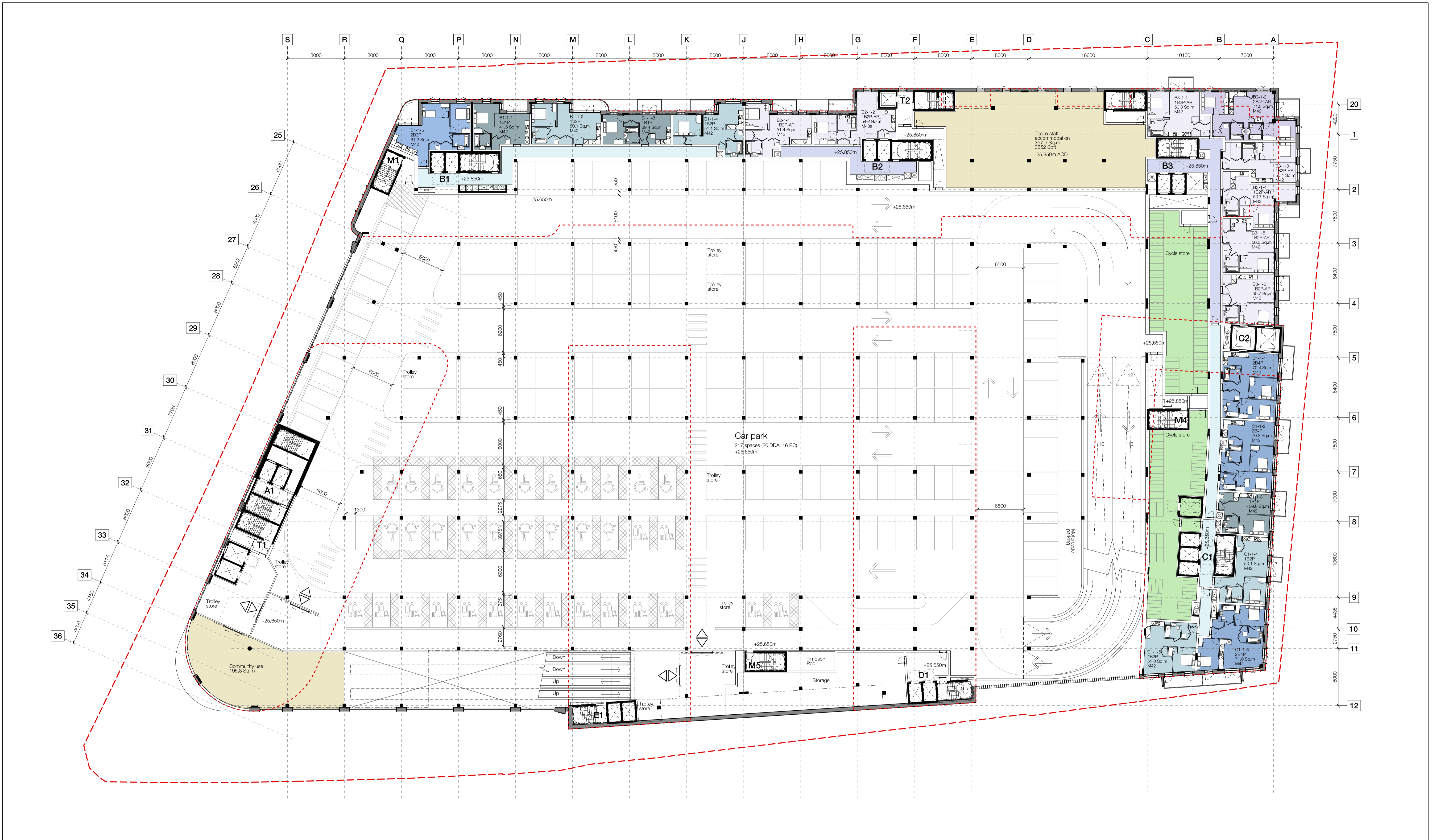
Issue Record	By	Chk	Date
P17 Planning Issue	MA	AC	27.08.2020
P16 Updated block plans & B3 layouts	MA	AC	21.08.2020
P15 Planning Issue	MA	AC	28.07.2020
P14 Planning Draft	TG	AC	17.07.2020
P13 Residential structure off	TG	AC	10.07.2020
P12 Design freeze 3	TG	AC	10.07.2020

Drawing Number
579-PTA-ZZ-01-DR-A-1001 Revision
P17

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Title
General arrangement plan
Level 01

Project
Syon Lane

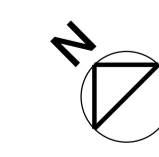
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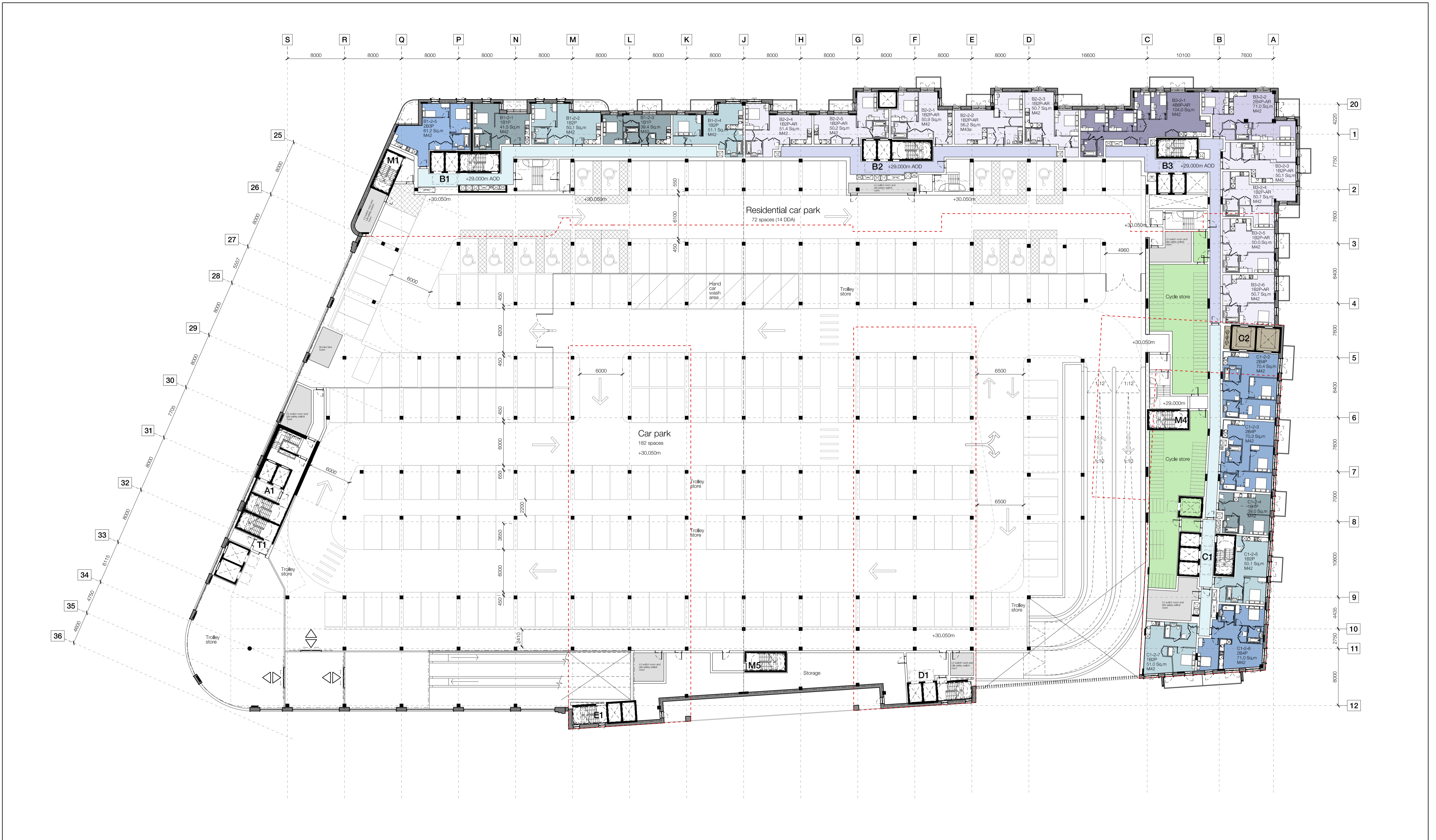
Issue Record	By	Chk	Date
P33 Planning Issue	MA	AC	27.08.2020
P32 Updated staff accommodation area	MA	AC	24.08.2020
P31 Updated block plans & B3 layouts	MA	AC	21.08.2020
P30 Planning Issue	MA	AC	28.07.2020
P29 Planning Draft	TG	AC	17.07.2020
P28 Residential structure off	TG	AC	10.07.2020

Drawing Number
579-PTA-ZZ-01-DR-A-1001 Revision
P33

Status
For Planning

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Title
General arrangement plan
Level 02

Project
Syon Lane

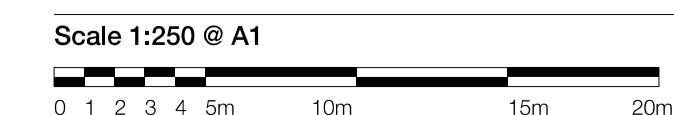
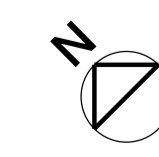
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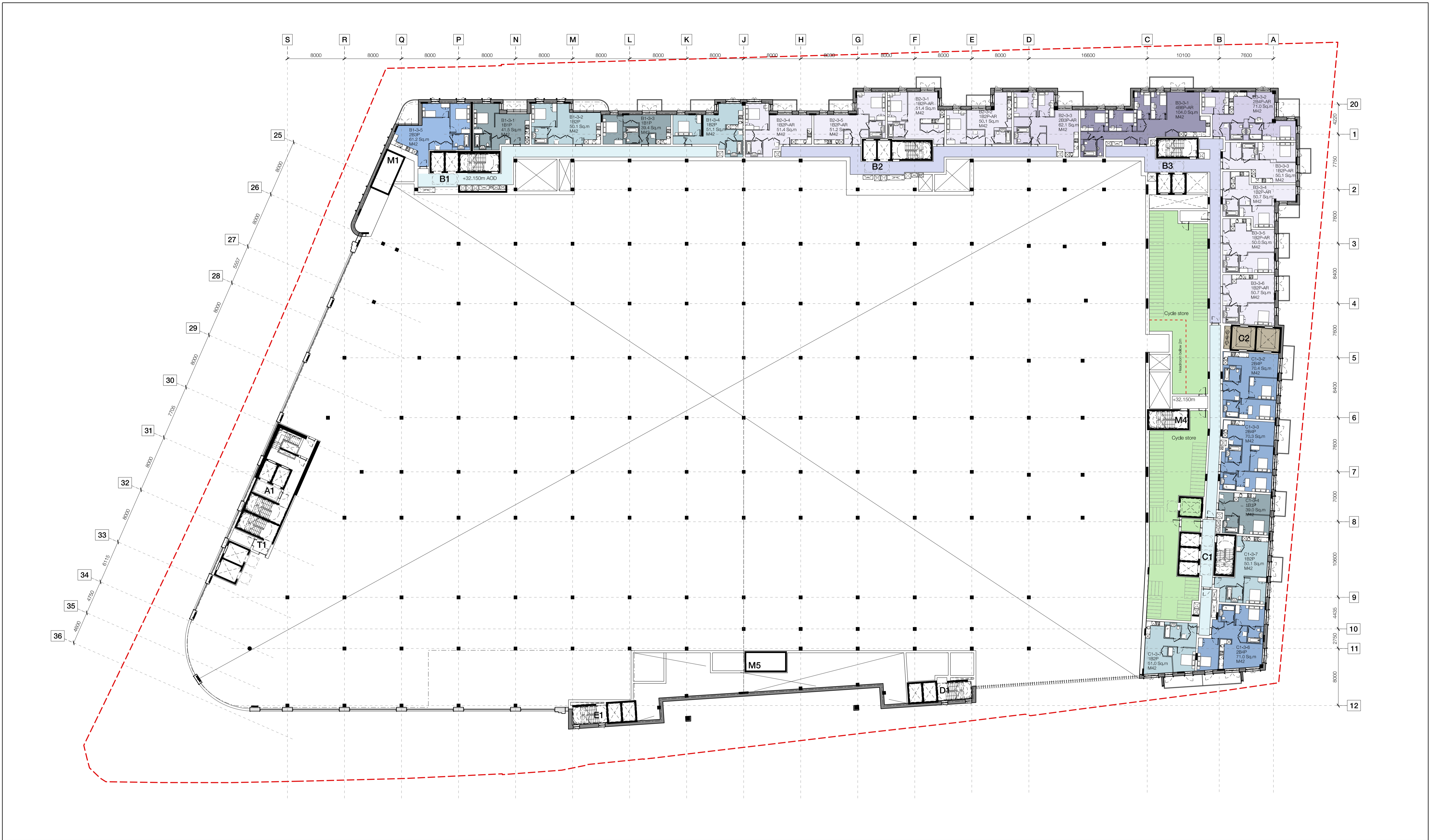
Issue Record	By	Chk	Date
P21 Planning Issue	MA	AC	04.09.2020
P40 Planning Issue	MA	AC	02.09.2020
P39 Planning Issue	MA	AC	27.08.2020
P38 Updated carpark	MA	AC	26.08.2020
P37 Updated carpark hatched area	MA	AC	24.08.2020
P36 Updated block plans & BG layouts	MA	AC	21.08.2020

Drawing Number
579-PTA-ZZ-02-DR-A-1001 Revision
P41

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Title
General arrangement plan
Level 03

Project
Syon Lane

Scale
1:250 @ A1 1:500 @ A3

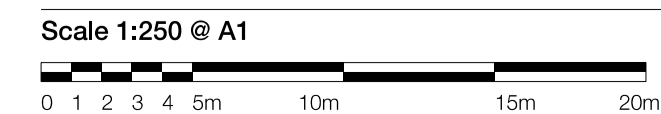
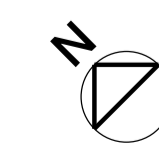
Issue Record	By	Chk	Date
P01 Planning Issue	MA	AC	27.08.2020
P00 Updated block plans & B3 layouts	AP	AC	21.08.2020
P29 Planning Issue	MA	AC	29.07.2020
P28 Planning Issue	MA	AC	28.07.2020
P27 Planning Draft	TG	AC	17.07.2020
P26 Residential structure off	TG	AC	10.07.2020

Drawing Number
579-PTA-ZZ-03-DR-A-1001

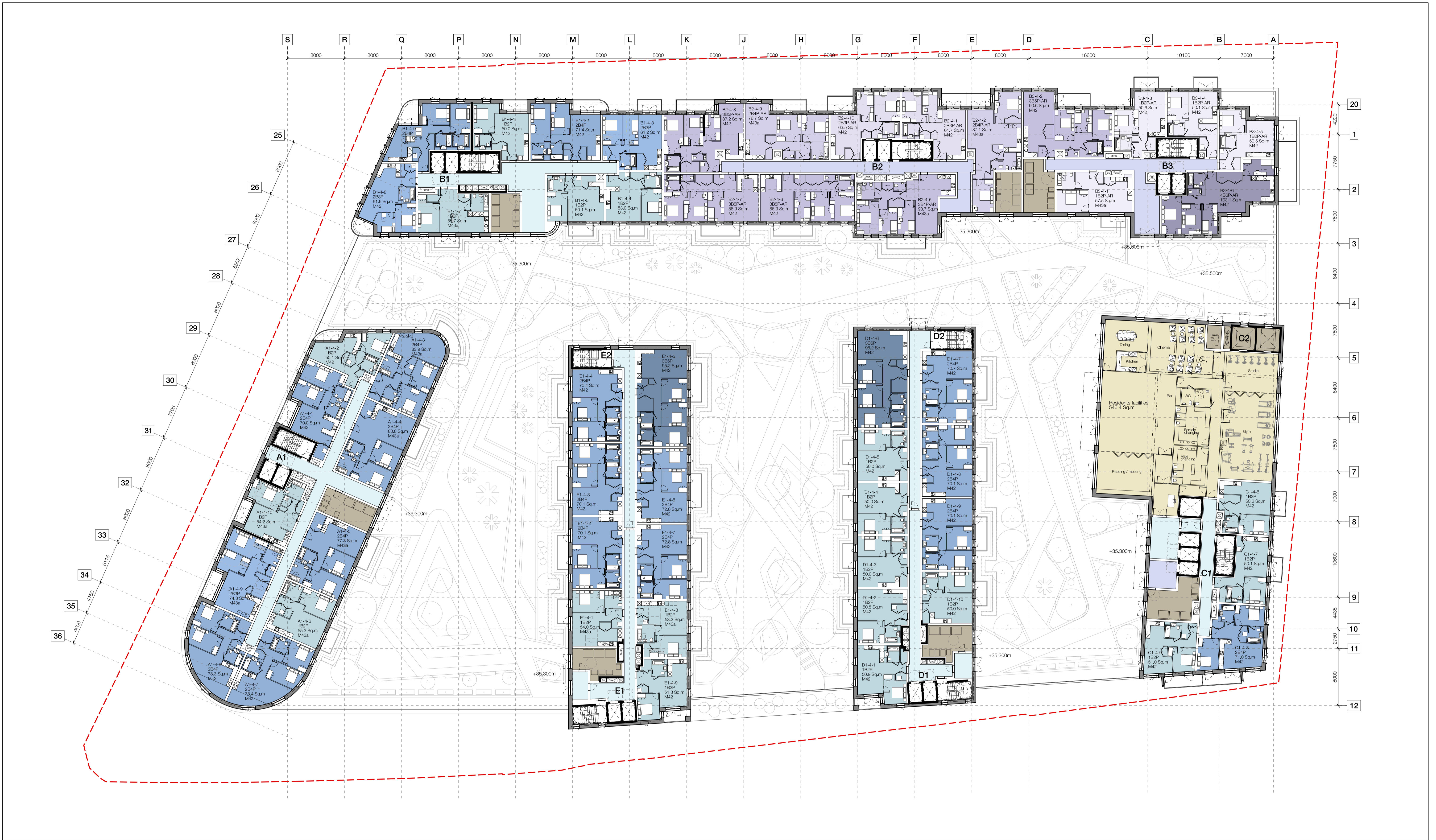
Revision
P31

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Title
General arrangement plan
Level 04 - Podium

Project
Syon Lane

Scale
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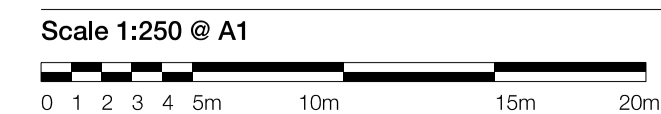
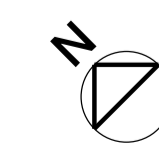
Issue Record	By	Chk	Date
P28 - Planning Issue	MA	AC	27.08.2020
P27 - Updated block plans & B3 layouts	MA	AC	21.08.2020
P26 - Planning Issue	JA	AC	07.08.2020
P25 - Planning Issue	MA	AC	28.07.2020
P24 - Planning Draft	TG	AC	17.07.2020
P23 - Residential structure off	TG	AC	10.07.2020

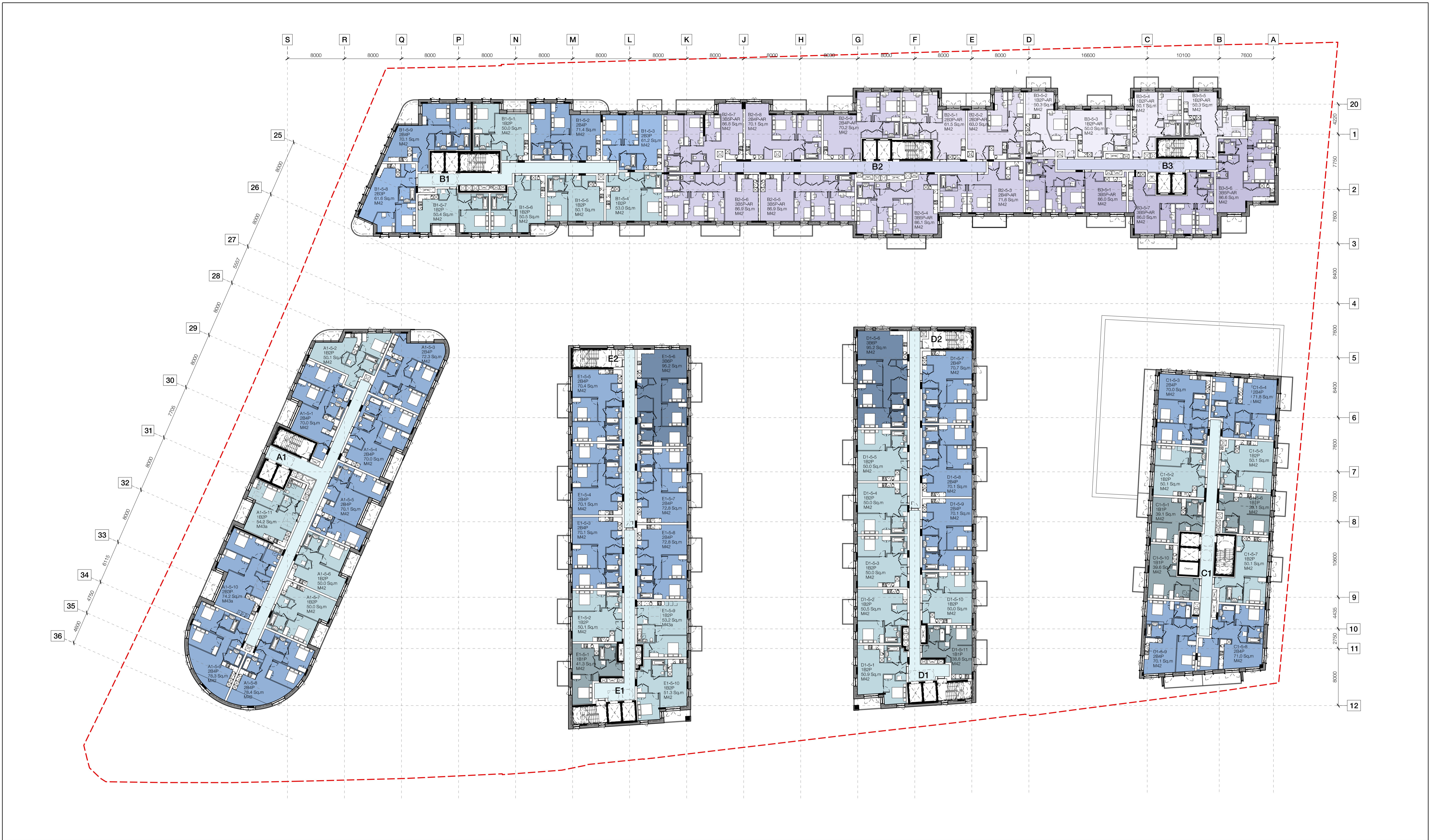
Drawing Number
579-PTA-ZZ-04-DR-A-1001

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P28

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Title
General arrangement plan
Level 05

Project
Syon Lane

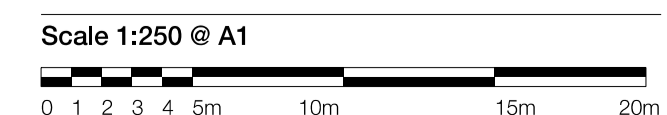
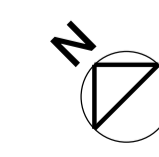
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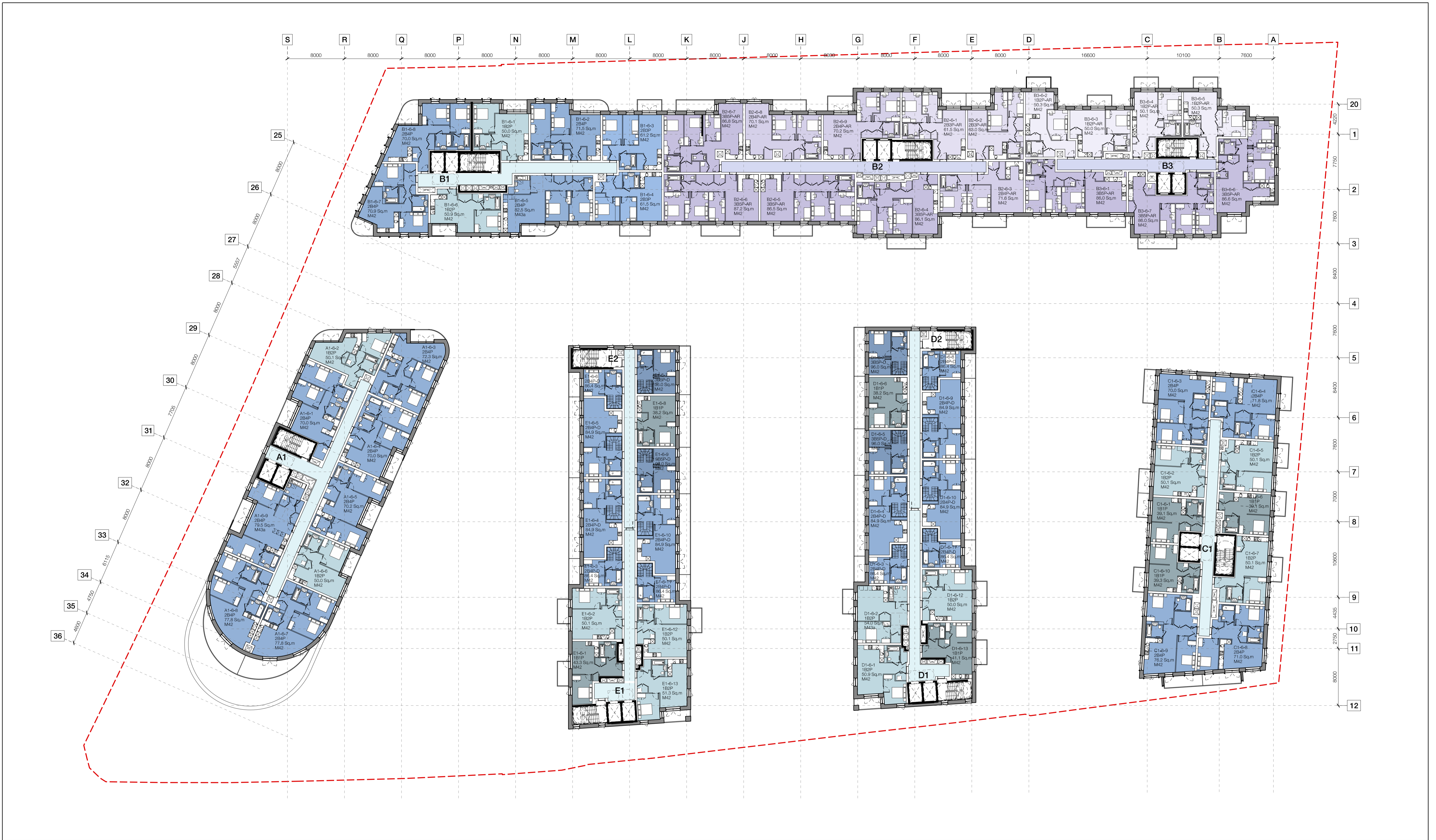
Issue Record	By	Chk	Date
P04 Planning Issue	MA	AC	27.08.2020
P03 Updated block plans & B3 layouts	AP	AC	21.08.2020
P02 Planning Issue	MA	AC	28.07.2020
P01 Planning Draft	TG	AC	17.07.2020
P00 Residential structure off	TG	AC	10.07.2020
P29 Design freeze 3	TG	AC	10.07.2020

Drawing Number
579-PTA-ZZ-05-DR-A-1001 Revision
P34

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Title
General arrangement plan
Level 06

Project
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Scale
1:250 @ A1 1:500 @ A3

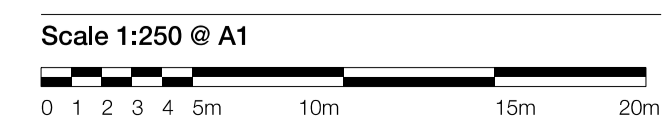
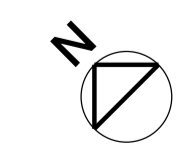
Issue Record	By	Chk	Date
P30 Planning Issue	MA	AC	27.08.2020
P29 Updated block plans & B3 layouts	AP	AC	21.08.2020
P28 Planning Issue	JA	AC	07.08.2020
P27 Planning Issue	MA	AC	28.07.2020
P26 Planning Draft	TG	AC	17.07.2020
P25 Design Freeze 3	TG	AC	10.07.2020

Drawing Number
579-PTA-ZZ-06-DR-A-1001

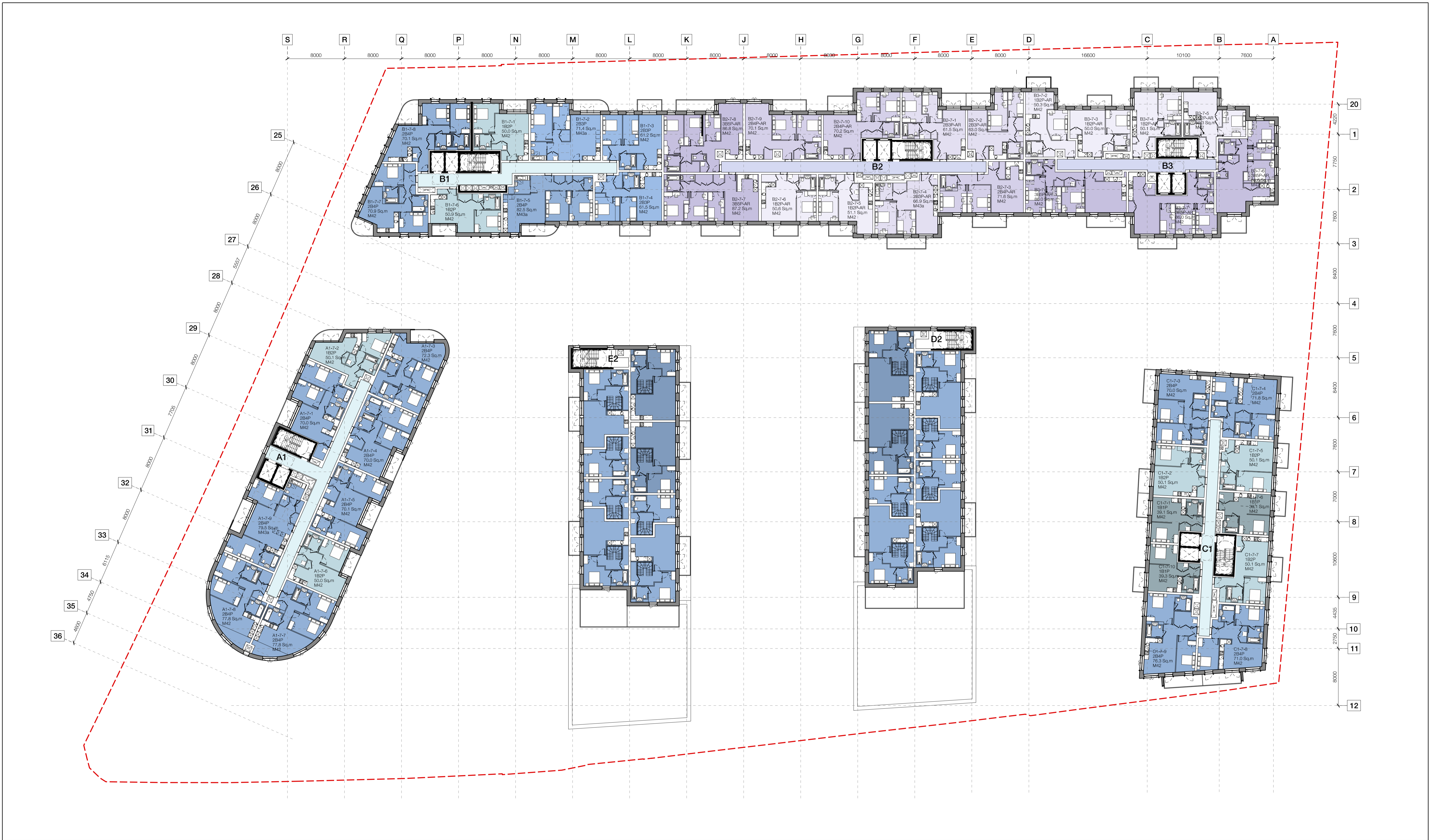
Revision
P30

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Title
General arrangement plan
Level 07

Project
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Scale
1:250 @ A1 1:500 @ A3

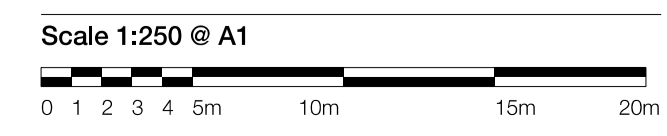
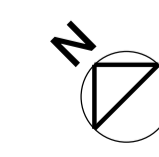
Issue Record	By	Chk	Date
P29 Planning Issue	MA	AC	27.08.2020
P28 Updated block plans & B3 layouts	AP	AC	21.08.2020
P27 Planning Issue	JA	AC	07.08.2020
P26 Planning Issue	MA	AC	29.07.2020
P25 Planning Issue	MA	AC	29.07.2020
P24 Planning Issue	MA	AC	28.07.2020

Drawing Number
579-PTA-ZZ-07-DR-A-1001

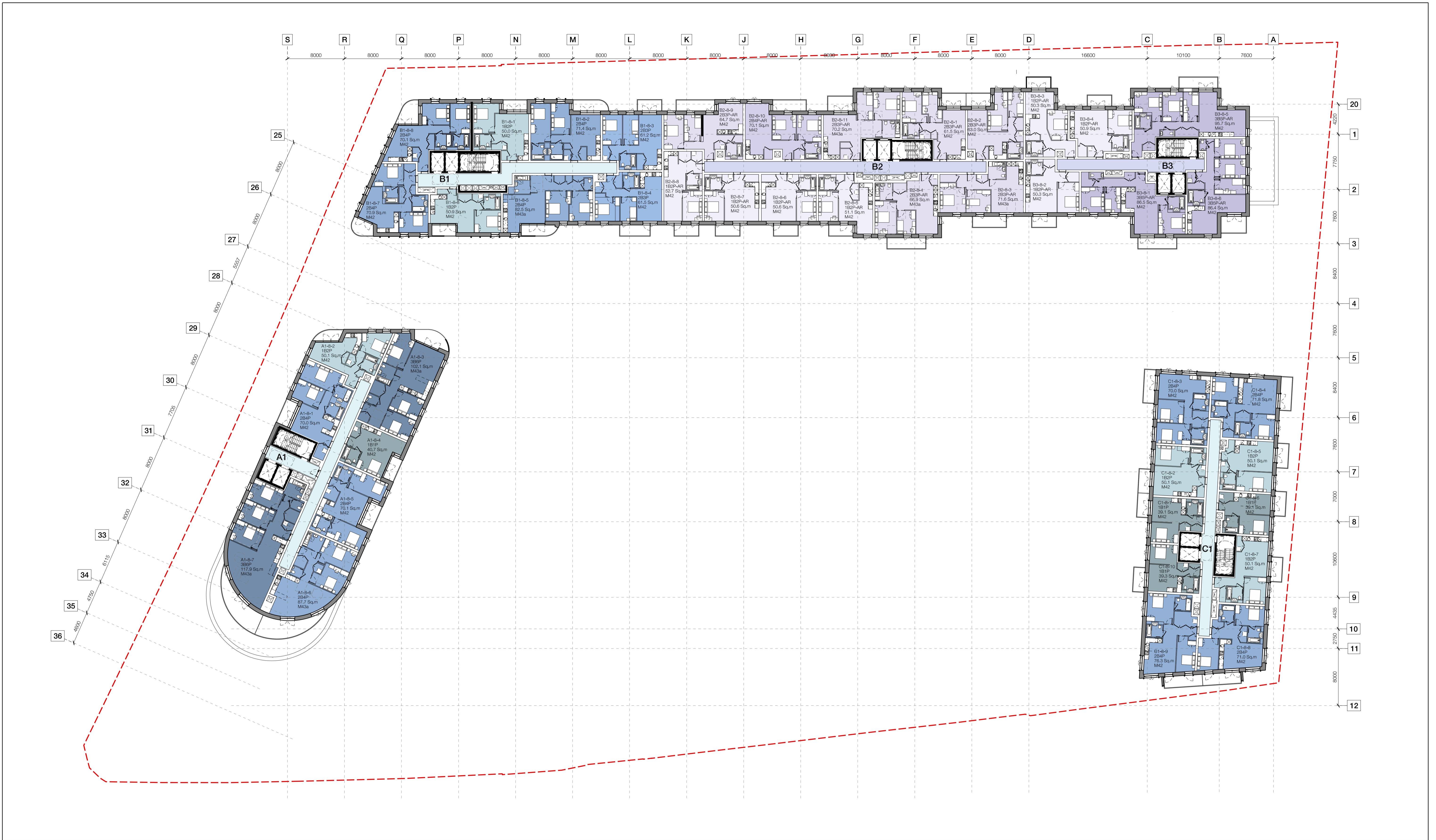
Revision
P29

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Title
General arrangement plan
Level 08

Project
Syon Lane

Scale
1:250 @ A1 1:500 @ A3

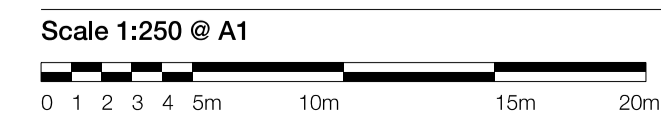
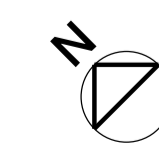
Issue Record	By	Chk	Date
P26 Planning Issue	MA	AC	27.08.2020
P25 Updated block plans & B3 layouts	MA	AC	21.08.2020
P24 Planning Issue	JA	AC	07.08.2020
P23 Planning Issue	MA	AC	28.07.2020
P22 Planning Draft	TG	AC	17.07.2020

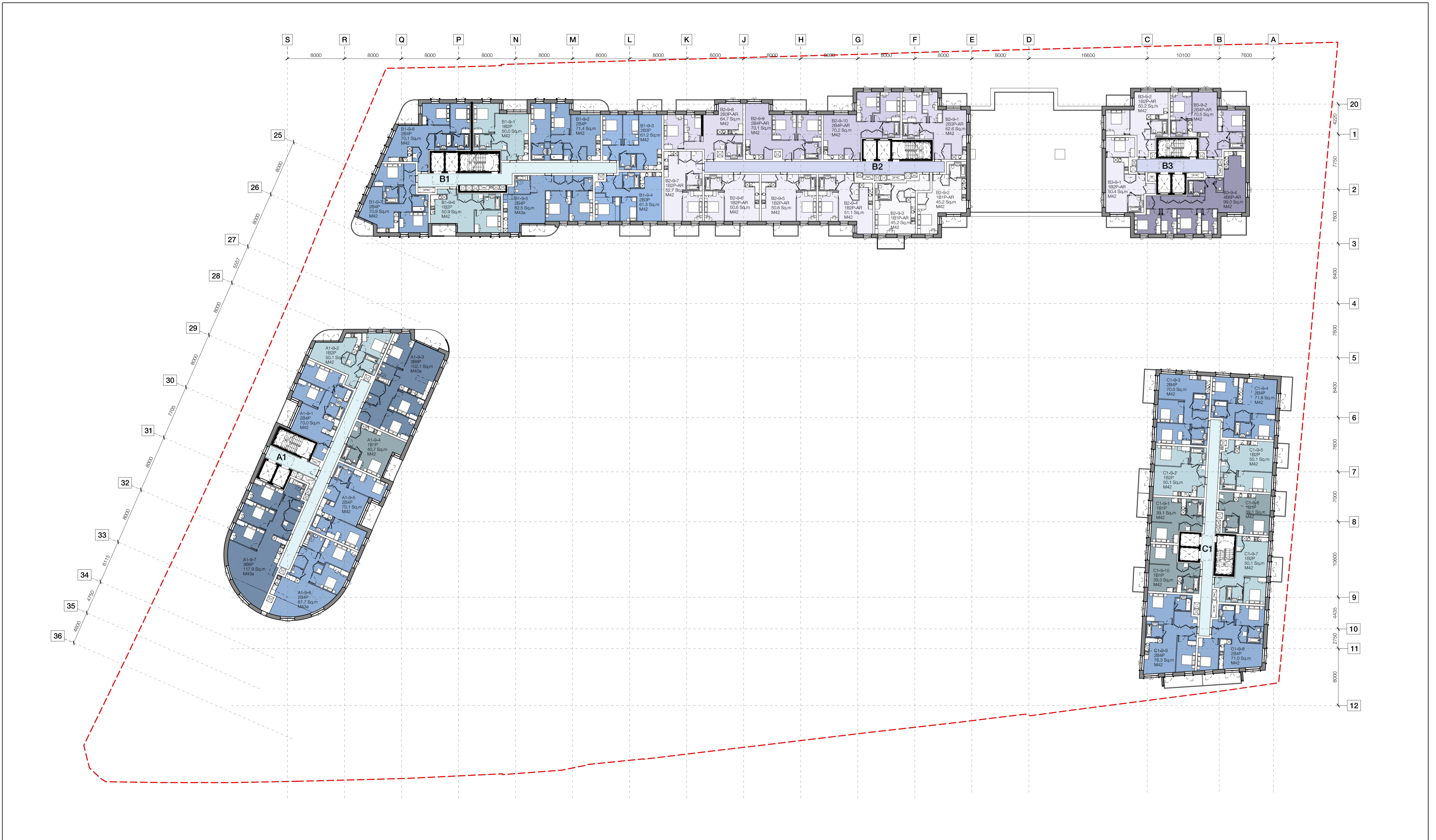
Drawing Number
579-PTA-ZZ-08-DR-A-1001

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P26

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Title
General arrangement plan
Level 09

Project
Syon Lane

Scale
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Issue Record	By	CHK	Date
P25 Planning Issue	MA	AC	28.08.2020
P24 Planning Issue	MA	AC	27.08.2020
P23 Updated block plans & B3 layouts	MA	AC	21.08.2020
P22 Planning Issue	MA	AC	28.07.2020
P21 Planning Draft	TG	AC	17.07.2020
P20 Design freeze 3	TG	AC	10.07.2020

Drawing Number
579-PTA-ZZ-09-DR-A-1001

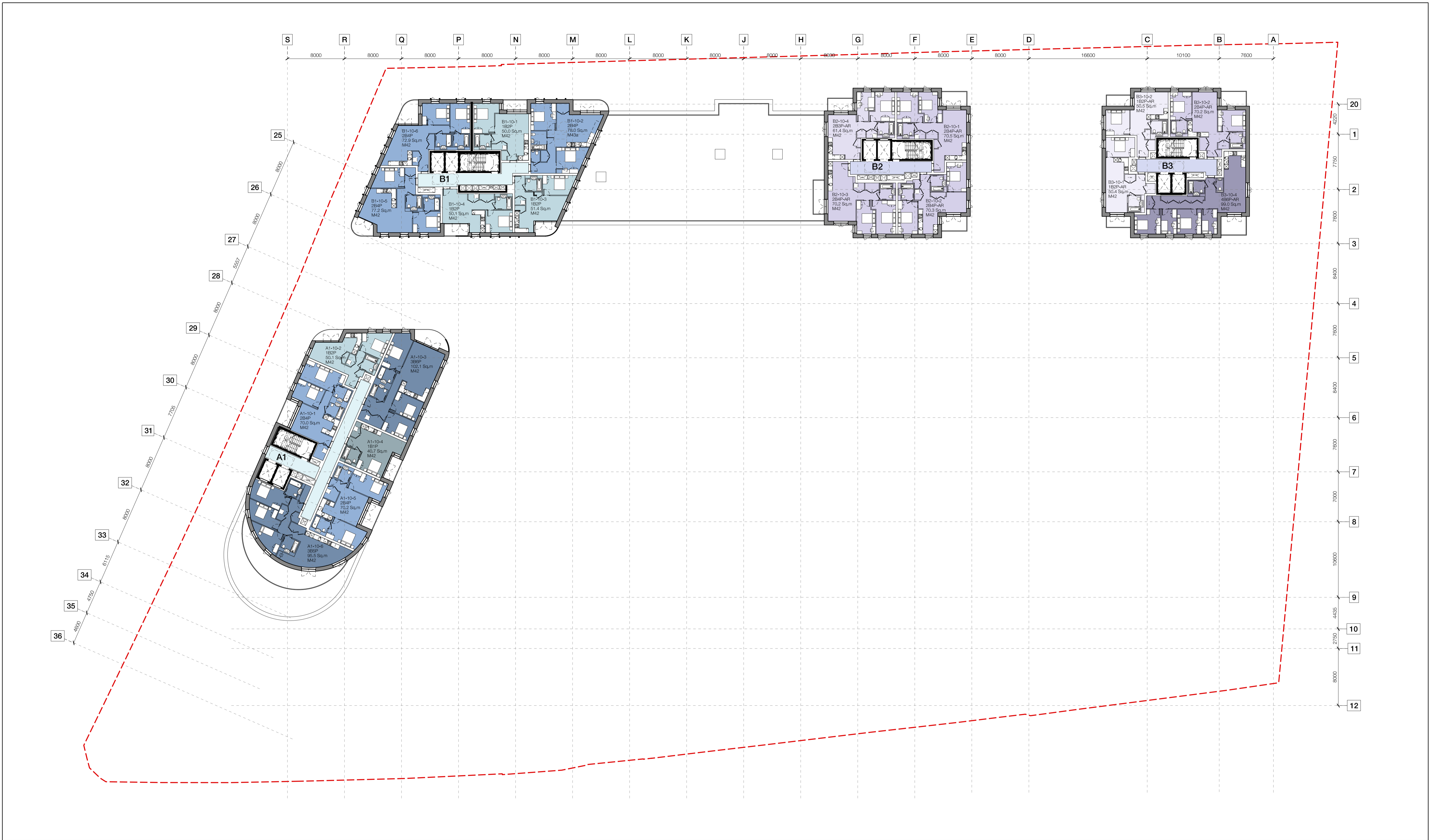
Revision
P25

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Scale 1:250 @ A1
0 1 2 3 4 5m 10m 15m 20m

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Title
General arrangement plan
Level 10

Project
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Scale
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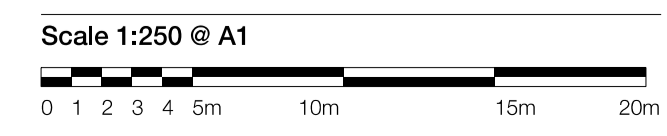
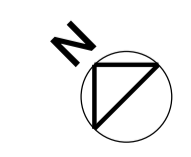
Issue Record	By	Chk	Date
P24 Planning Issue	MA	AC	27.08.2020
P23 Updated block plans & B3 layouts	MA	AC	21.08.2020
P22 Planning Issue	MA	AC	28.07.2020
P21 Planning Draft	TG	AC	17.07.2020
P20 Design Freeze 3	TG	AC	10.07.2020

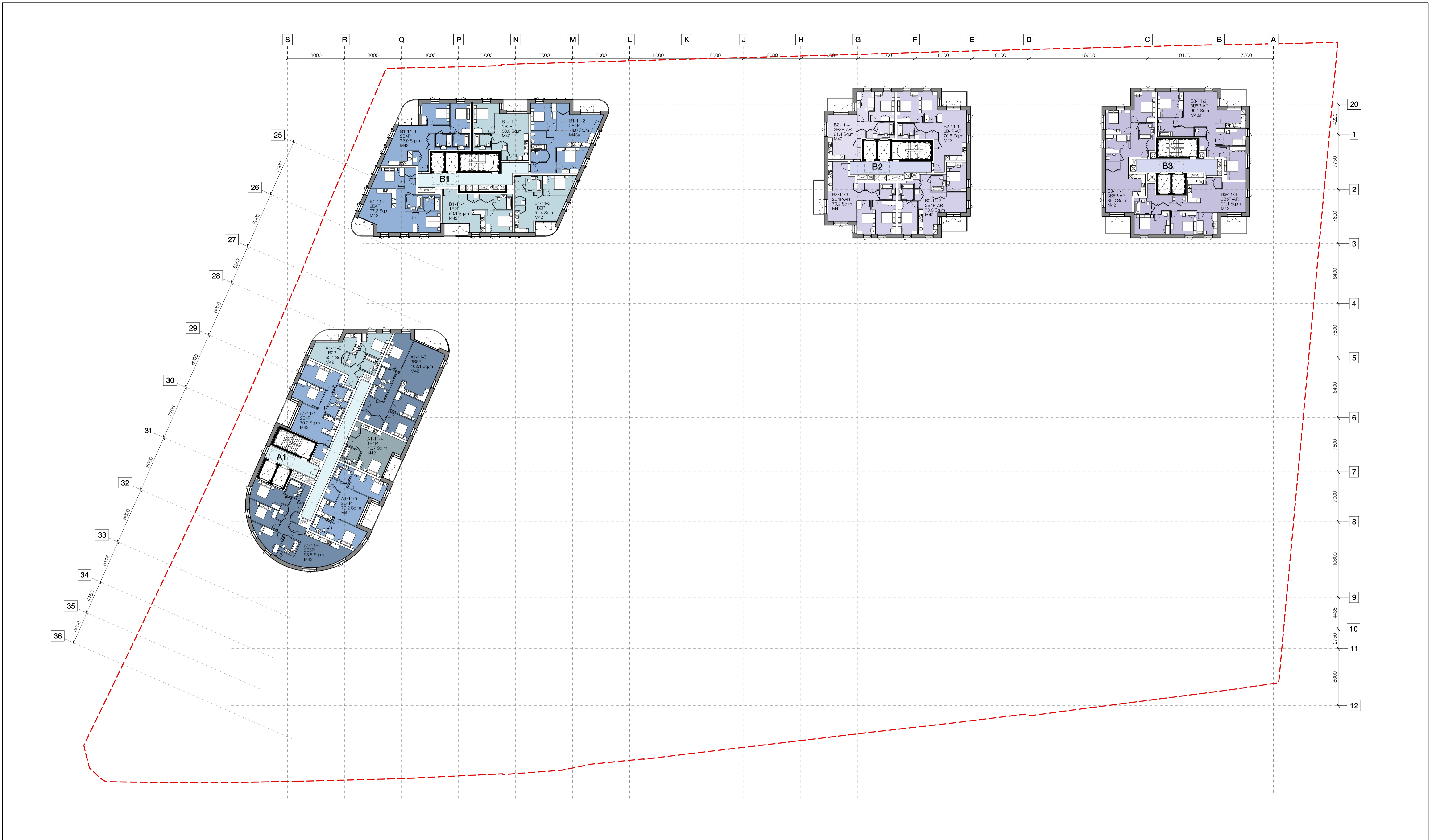
Drawing Number
579-PTA-ZZ-10-DR-A-1001

Revision
P24

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Title
General arrangement plan
Level 11

Project
Syon Lane

Scale
1:250 @ A1 1:500 @ A3

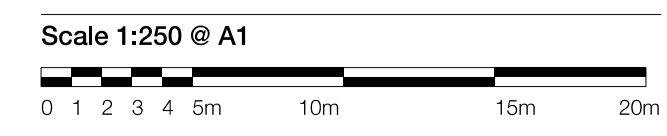
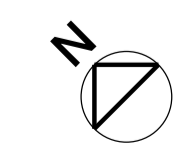
Issue Record	By	Chk	Date
P25 - Planning Issue	MA	AC	27.08.2020
P24 - Updated block plans & B3 layouts	MA	AC	21.08.2020
P23 - Planning Issue	MA	AC	29.07.2020
P22 - Planning Issue	MA	AC	28.07.2020
P21 - Planning Draft	TG	AC	17.07.2020
P20 - Design Freeze 3	TG	AC	10.07.2020

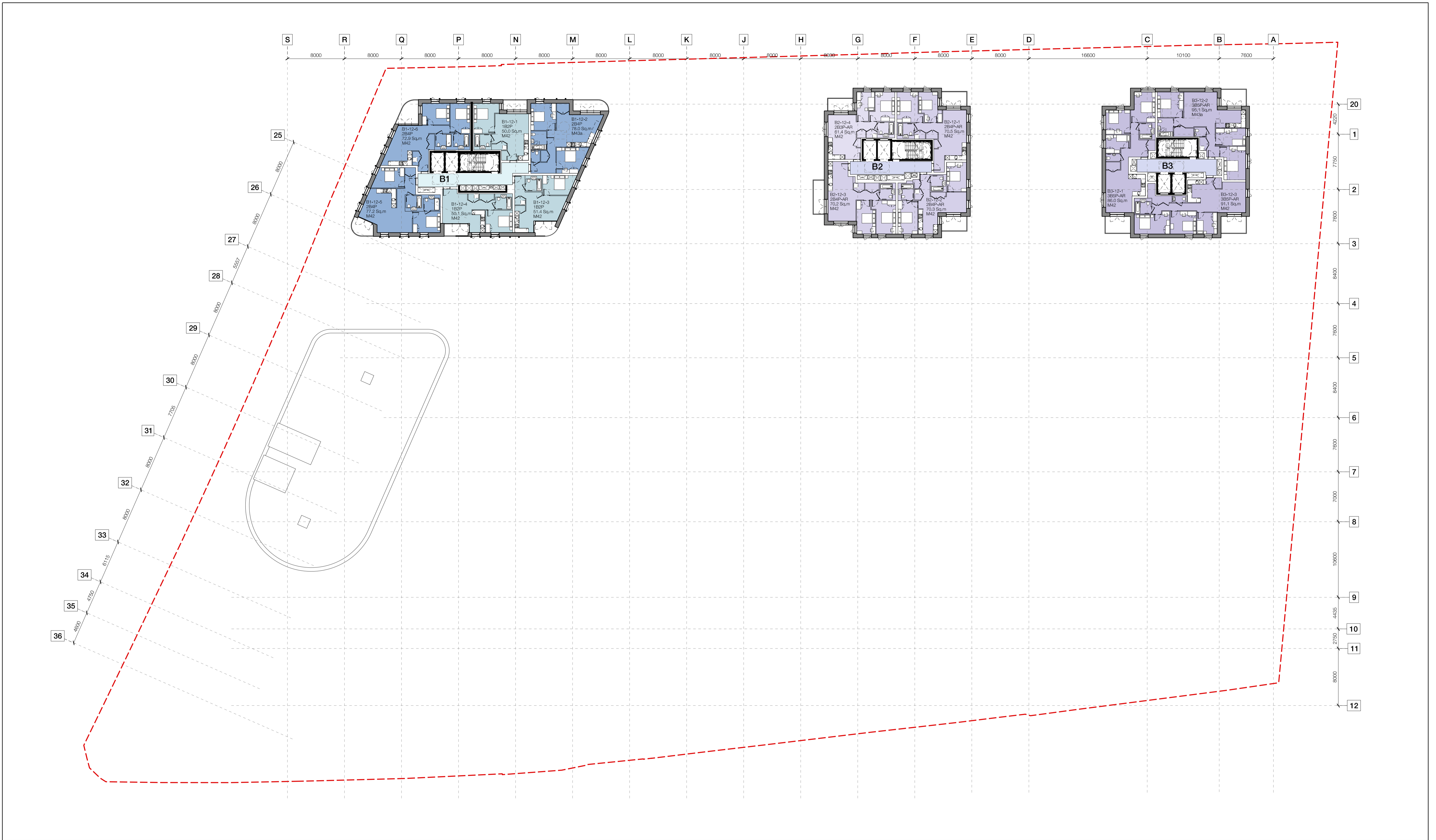
Drawing Number
579-PTA-ZZ-11-DR-A-1001

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Title
General arrangement plan
Level 12

Project
Syon Lane

Scale
1:250 @ A1 1:500 @ A3

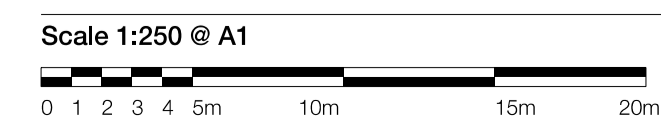
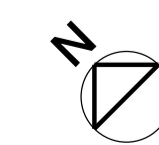
Issue Record	By	Chk	Date
P25 Planning Issue	MA	AC	27.08.2020
P24 Updated block plans & B3 layouts	MA	AC	21.08.2020
P23 Planning Issue	MA	AC	28.07.2020
P22 Planning Draft	TG	AC	17.07.2020
P21 Design freeze 3	TG	AC	10.07.2020
P20 Design update Issue	TG	AC	01.07.2020

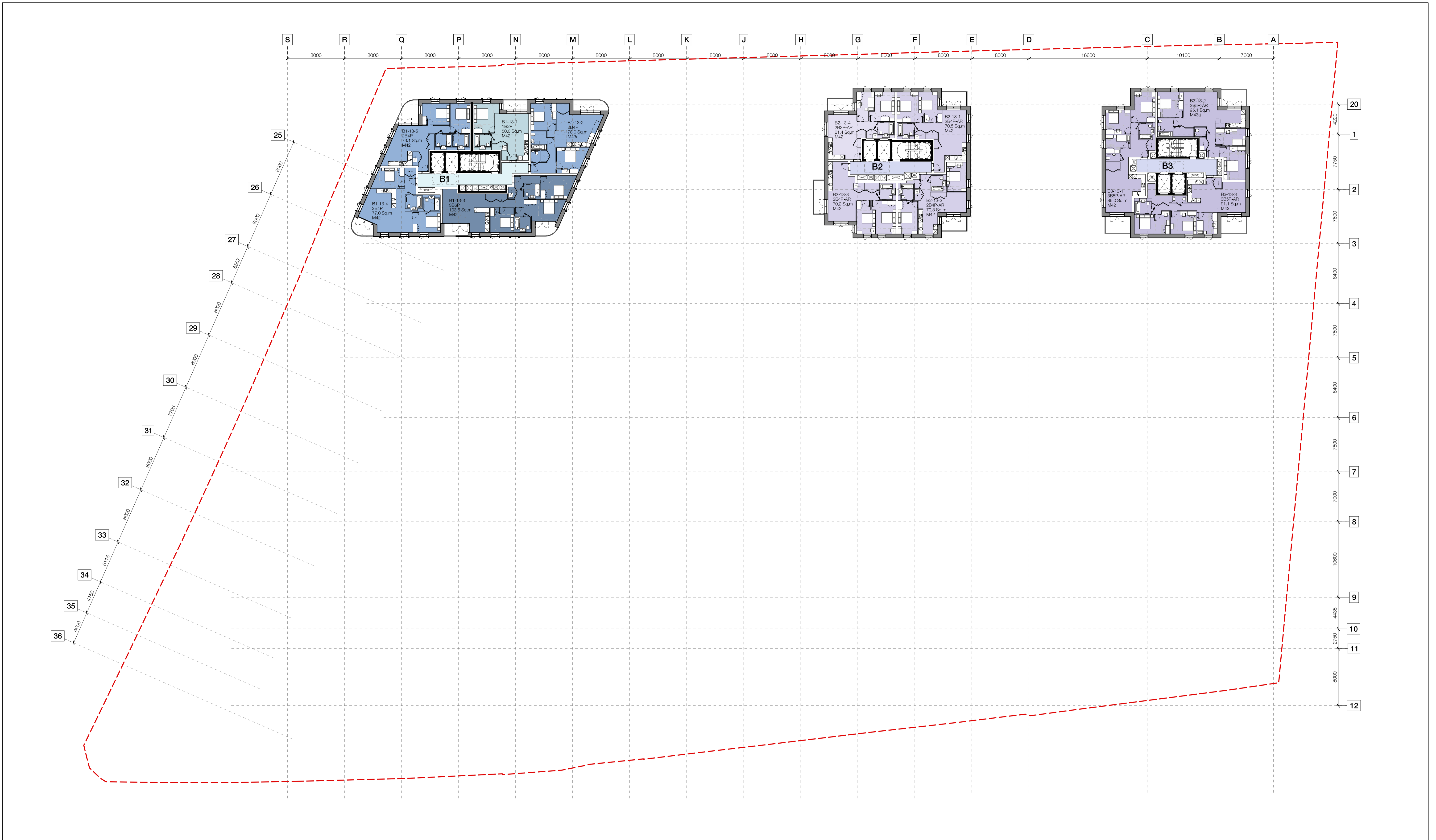
Drawing Number
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Title
General arrangement plan
Level 13

Project
Syon Lane

Scale
1:250 @ A1 1:500 @ A3

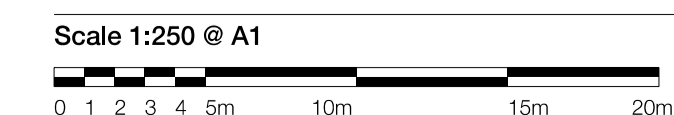
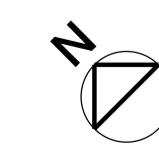
Issue Record	By	Chk	Date
P24 Planning Issue	MA	AC	27.08.2020
P23 Updated block plans & B3 layouts	MA	AC	21.08.2020
P22 Planning Issue	MA	AC	28.07.2020
P21 Planning Draft	TG	AC	17.07.2020
P20 Design freeze 3	TG	AC	10.07.2020
P19 Design update Issue	TG	AC	01.07.2020

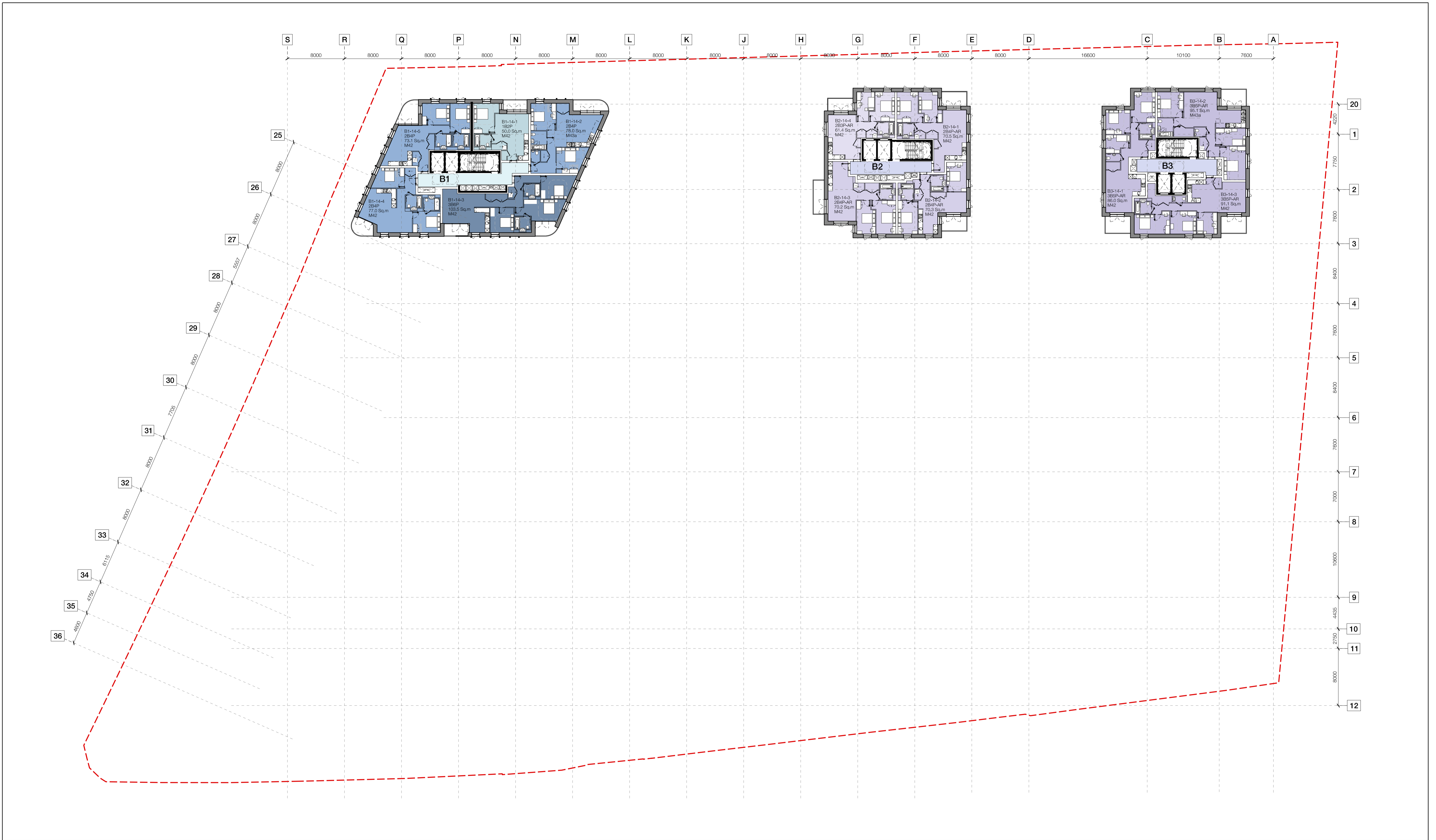
Drawing Number
579-PTA-ZZ-13-DR-A-1001

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Title
General arrangement plan
Level 14

Project
Syon Lane

Scale
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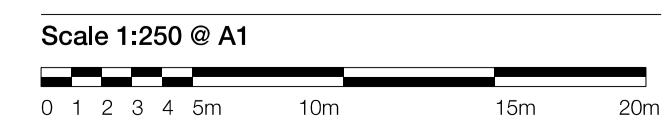
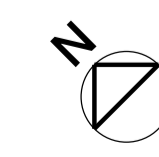
Issue Record	By	Chk	Date
P24 Planning Issue	MA	AC	27.08.2020
P23 Updated block plans & B3 layouts	MA	AC	21.08.2020
P22 Planning Issue	MA	AC	28.07.2020
P21 Planning Draft	TG	AC	17.07.2020
P20 Design freeze 3	TG	AC	10.07.2020
P19 Design update Issue	TG	AC	01.07.2020

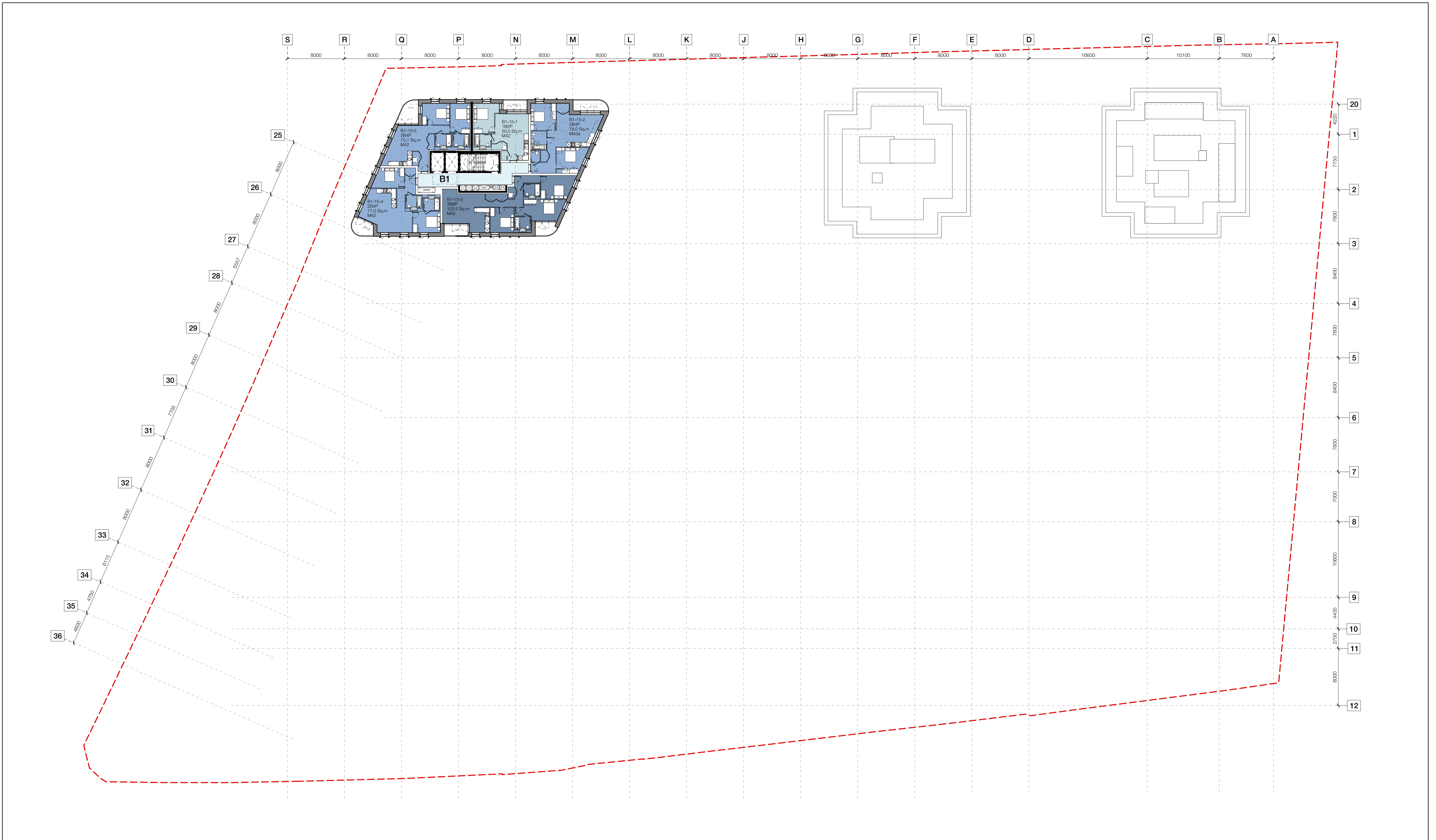
Drawing Number
579-PTA-ZZ-14-DR-A-1001

Revision
P24

Status
For Planning

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Title
General arrangement plan
Level 15

Project
Syon Lane

Scale
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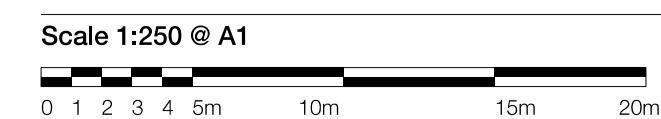
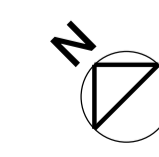
Issue Record	By	Chk	Date
P21 Planning Issue	MA	AC	27.08.2020
P20 Planning Issue	MA	AC	26.07.2020
P19 Planning Draft	TG	AC	17.07.2020
P18 Design freeze 3	TG	AC	10.07.2020
P17 Design update issue	TG	AC	01.07.2020
P16 Design update issue	TG	AC	29.06.2020

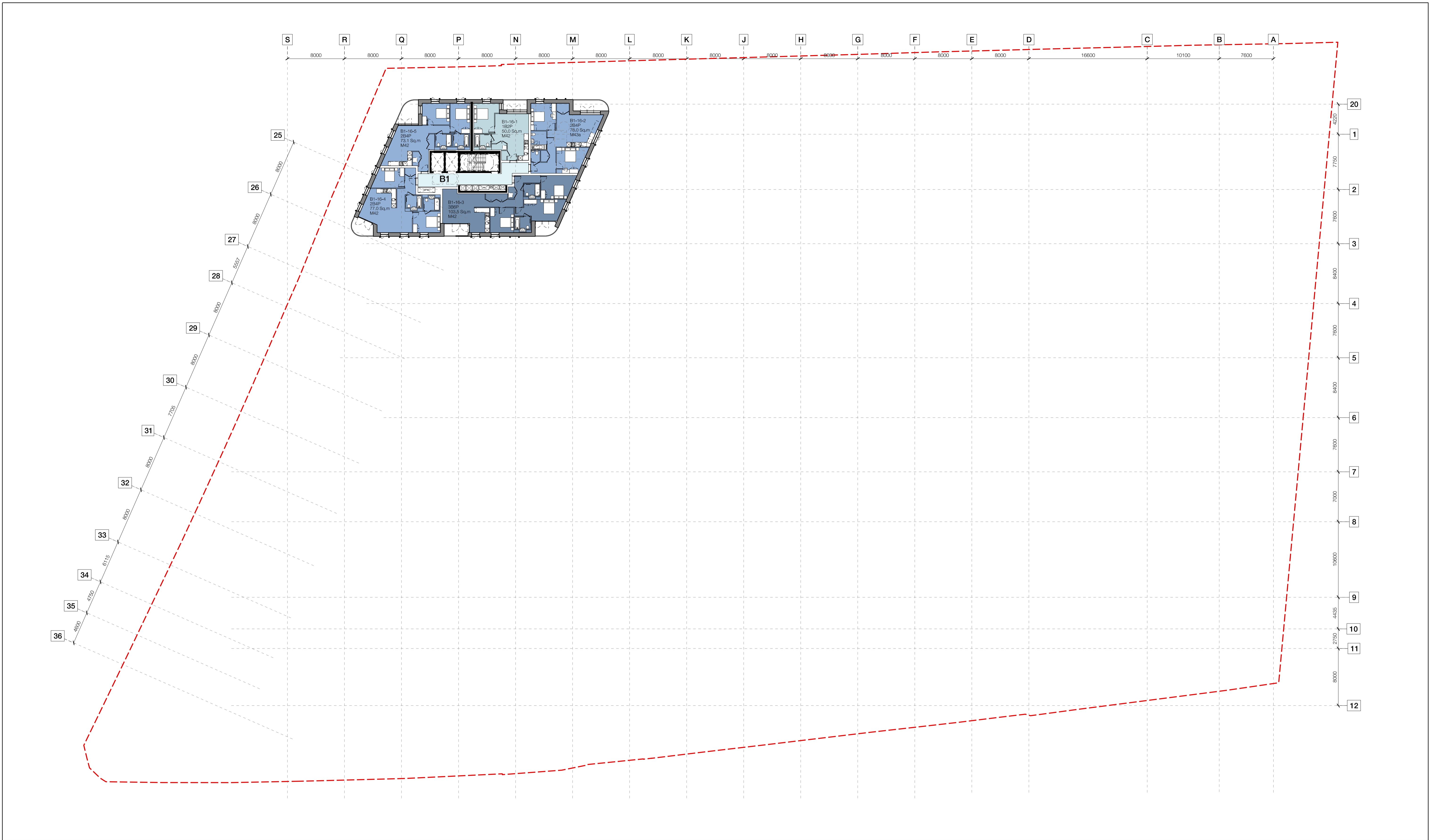
Drawing Number
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Revision
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Title
General arrangement plan
Level 16

Project
Syon Lane

Scale
1:250 @ A1 1:500 @ A3

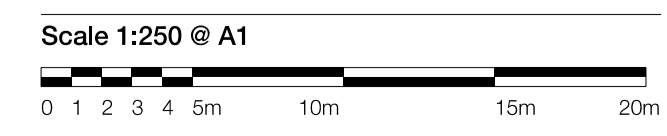
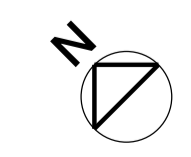
Issue Record	By	Chk	Date
P21 Planning Issue	MA	AC	27.08.2020
P20 Planning Issue	MA	AC	26.07.2020
P19 Planning Draft	TG	AC	17.07.2020
P18 Design freeze 3	TG	AC	10.07.2020
P17 Design update issue	TG	AC	01.07.2020
P16 Design update issue	TG	AC	29.06.2020

Drawing Number
579-PTA-ZZ-16-DR-A-1001

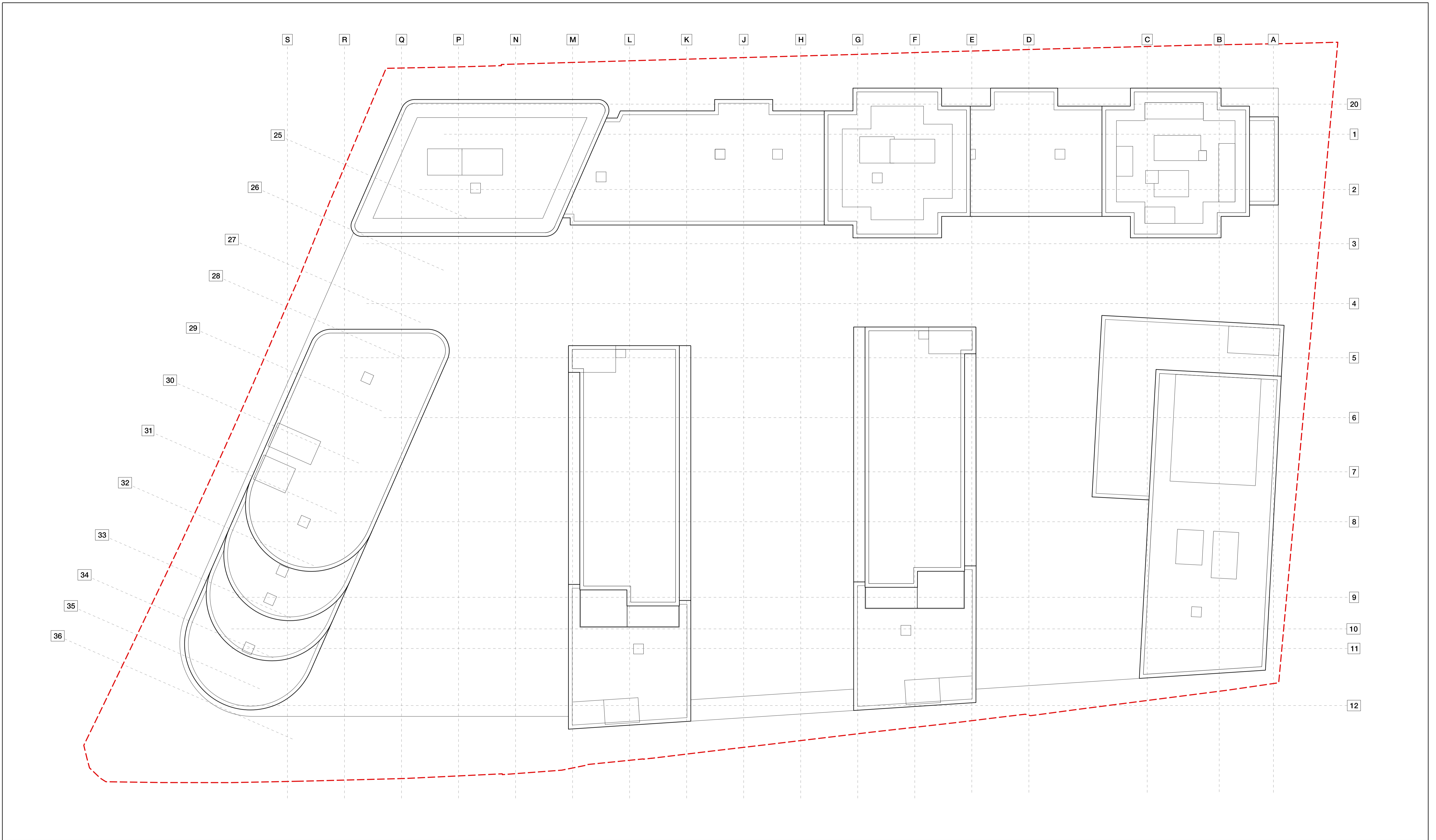
Revision
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Title
General arrangement plan
Roof plan

Project
Syon Lane

Scale
1:250 @ A1 1:500 @ A3

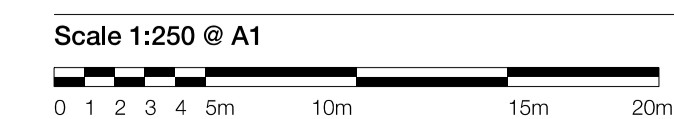
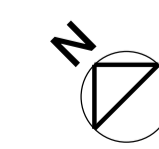
Issue Record	By	Chk	Date
P10 Planning Issue	MA	AC	29.07.2020
P09 Planning Issue	MA	AC	28.07.2020
P08 Planning Draft	TG	AC	17.07.2020
P07 Design freeze 3	TG	AC	10.07.2020
P06 Buildings' outlines updated	IT	AC	22.06.2020
P05 Buildings' outlines updated	MA	AC	22.06.2020

Drawing Number
579-PTA-ZZ-RF-DR-A-1001

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Appendix B

Site Photographs



Homebase Car Park in the North of the Site



Site Boundary along the East



Undercroft Car Parking in the South with Garden Centre Above



Access Road to the Delivery Yard



Access Road to Secured Car Park in the South. Retaining Wall on the Left



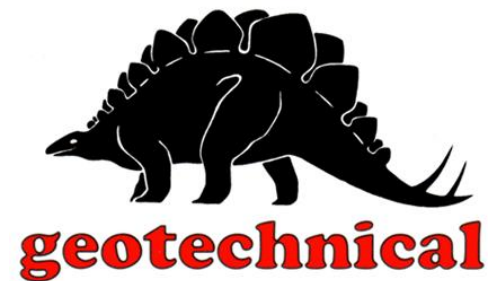
Undercroft Car Park

Project Details	WIE15238-100: Homebase, 67 Syon Lane
Figure Title	Figure B1: Site Photographs
Figure Ref	WIE15238-100_GR_4GQRA_B1A
Date	November 2018
File Location	\\s-incs\wie\projects\wie15238\100\graphics\4.gqra\issued figures
	www.watermangroup.com

Appendix C

Ground Investigation Factual Report

- **Geotechnical Engineering Ltd – Factual Report on Ground Investigation. Report Ref. 34740**



WIE15238- HOMEBASE, ISLEWORTH

FACTUAL REPORT ON
GROUND INVESTIGATION

Prepared for WATERMAN INFRASTRUCTURE AND
ENVIRONMENT LTD

Report Ref: 34740

Geotechnical Engineering Ltd

Centurion House, Olympus Park
Quedgeley, Gloucester. GL2 4NF

01452 527743

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WIE15238- HOMEBASE, ISLEWORTH

FACTUAL REPORT ON GROUND INVESTIGATION

Prepared for WATERMAN INFRASTRUCTURE AND
ENVIRONMENT LTD

Report Ref: 34740

PROJECT: Environmental assessment.

VOLUME - VERSION	STATUS	ORIGINATOR	CHECKER	APPROVED	DATE
1 of 1 – A	DRAFT	BC	CT	-	22/11/2018
1 of 1 – B	FINAL	BC	CT	CT	28/11/2018
ORIGINATOR			APPROVER		
					
B CORRIGAN Senior Engineering Geologist			C THOMAS Geotechnical Consultant		

The report is not to be used for contractual or engineering purposes unless this sheet is signed and the report designated "Final".

The report has been prepared for the sole use and reliance by Waterman Infrastructure and Environment Ltd. GEL accepts no liability as a result of the use or reliance of this report by any other parties.



CONTENTS

REPORT	PAGE
1. INTRODUCTION	1
2. SITE LOCATION AND GEOLOGY	1
3. GROUND INVESTIGATION	1
3.1 Fieldwork	1
3.2 Logging.....	4
3.3 Laboratory Testing	5
4. REFERENCES	6

FIGURES	Nos.
EXPLORATORY HOLE LOCATION PLAN	1

APPENDICES

APPENDIX A	FIELDWORK DATA
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1. INTRODUCTION

It is proposed to undertake an environmental assessment at the existing Homebase store in Isleworth, West London. Geotechnical Engineering Limited (GEL) was instructed by Watermans Infrastructure and Environment Ltd (the Client) to carry out an investigation to determine the ground conditions.

The scope of works and terms and conditions of appointment were specified by the Client and GEL correspondence reference T29024 dated 17th October 2018. The investigation was carried out under direction and part time supervision of the Client.

This report describes the investigation and presents the findings.

2. SITE LOCATION AND GEOLOGY

The site is situated within the existing car park the Homebase store, 67 Syon Lane, Isleworth and may be located by its National Grid co-ordinates TQ 164 773.

British Geological Survey (BGS) England and Wales (Sheet No. 270, 1:50,000, 1998) and the BGS online geology (1:50,000) indicate the site is underlain by superficial deposits of the Taplow Gravel underlain by the London Clay Formation. Made ground is expected on site due to current land use.

3. GROUND INVESTIGATION

3.1 Fieldwork

The fieldwork was carried out in general accordance with BS5930:2015 during the period 1st to 14th November 2018 and comprised seven boreholes and one hand dug pit.



The exploratory hole locations were selected by the Client and set out by this Company and are shown on Figure 1. The ground level and co-ordinates at each exploratory hole was established by this Company using GPS techniques, except for WS01 which was unable to be surveyed directly due to overhead obstructions.

The site is considered to be in an area at risk of Unexploded Ordnance (UXO) and therefore required an Unexploded Ordnance Survey. The survey, carried out by others, comprised on site monitoring by a UXO specialist from First Line Defence Limited. Down hole magnetometer testing was also undertaken at regular intervals as the boreholes were advanced.

The boreholes, referenced BH01 to BH03 (Appendix A), were formed using a track-mounted Geotechnical Pioneer Rig. Initially, rotary core drilling (300mm) techniques were used to penetrate the tarmac surface. An inspection pit was then hand excavated at each borehole location to a depth of 1.20m to check for buried services. Disturbed samples were taken and retained in a combination of plastic tubs, bags and glass jars. Heavy duty dynamic sampling techniques were then employed to produce a continuous disturbed sample of 112mm nominal diameter reducing to 97 and 83mm (BH02 and BH03) as the borehole was advanced. The samples were recovered in semi-rigid plastic liner.

On refusal to dynamic sampling the boreholes BH01 and BH03 were continued by rotary core drilling techniques utilising a water flush. A double-tube swivel core barrel with semi-rigid plastic liner was utilised to recover a continuous sample of 120mm diameter. Where appropriate, dynamic sampling techniques were carried out to recover dropped core or where rotary core drilling was not suitable.

The dynamic samples and rotary core were extracted horizontally from the sampler and core barrel respectively, the semi-rigid liner was cut to length and caps placed at each end



to retain moisture content. All samples and core were retained in sequence in labelled, wooden coreboxes.

The boreholes, referenced WS01 to WS04 (Appendix A), were formed using a Terrier 2000 rig. Initially, a hydraulic breaker was used in boreholes WS01, WS02 and WS04 or rotary core drilled (300mm) to penetrate tarmacadam surface. An inspection pit was then hand excavated at each borehole location and from surface at WS03 to a depth of 1.20m to check for buried services. Disturbed samples were taken and retained in a combination of plastic tubs, bags and glass jars. Dynamic sampling techniques were then employed in boreholes WS01 and WS02 to produce a continuous disturbed sample of 83mm diameter. The samples were recovered in semi-rigid plastic liner.

The samples were extracted horizontally from the sampler, labelled and caps placed each end to retain moisture.

Standard penetration tests (SPT) were carried out in general accordance with BS EN ISO 22476-3:2005+A1:2011. A split barrel was used and the samples retained in airtight tubs. The SPT N value was taken as the number of blows to penetrate the 300mm test drive following a 150mm seating drive. Where low penetration was recorded the seating drive was terminated at 25 blows and the test drive completed after a further 50 blows. Detailed SPT results, together with the energy ratio (E_r), are presented in Appendix A and summarised as uncorrected N values on the borehole logs.

Boreholes were monitored for groundwater ingress as dynamic sampling proceeded. Water levels were recorded at the start and finish of each day's work, on completion of the borehole and are presented on the relevant log.

On completion gas/water monitoring standpipes were installed in BH01 to BH03, WS01, WS02 and WS03. Each installation consisted of a 50mm ID HDPE slotted tube set in a filter response



zone of non-calcareous pea gravel. The installation was sealed above and below in BH01 to BH03 (above only in WS01, WS02 and WS03) with a bentonite plug and accessed via a valve assembly. The installations were protected at the surface by a lockable stopcock cover set in concrete. Installation details are given on the relevant borehole log.

On completion, WS04 was backfilled with soils arisings and bentonite pellets and the surface reinstated.

Trial pit, referenced HP05 (Appendix A), was hand excavated to obtain samples. On completion the trial pit was backfilled with arisings compacted in suitable layers by hand and the ground surface was reinstated.

Samples for chemical analyses were dispatched from site directly to i2 Analytical under a Chain of Custody. The remaining samples were brought to this Company's laboratory for testing and storage.

3.2 Logging

The logging of soils and rocks was carried out by an Engineering Geologist in general accordance with BS5930:2015. A key to the exploratory hole logs is presented in Appendix A.

Detailed descriptions of the core and samples are given in the borehole logs, Appendix A, along with details of sampling, in situ testing, groundwater ingress, installations and relevant comments on drilling techniques.

Prior to logging, photographs of the core were taken and are presented separately.



The trial pit was logged in situ. Detailed descriptions are given in the trial pit logs, Appendix A, along with details of sampling and in situ testing, groundwater ingress and relevant comments on stability and excavatability.

3.3 Laboratory Testing

No geotechnical laboratory testing was required as part of this contract.

Selected samples were dispatched to i2 Analytical Laboratories, where chemical analyses were carried out to in-house methods for a suite of contaminants. All analyses were arranged directly by the Client and do not form part of this report.

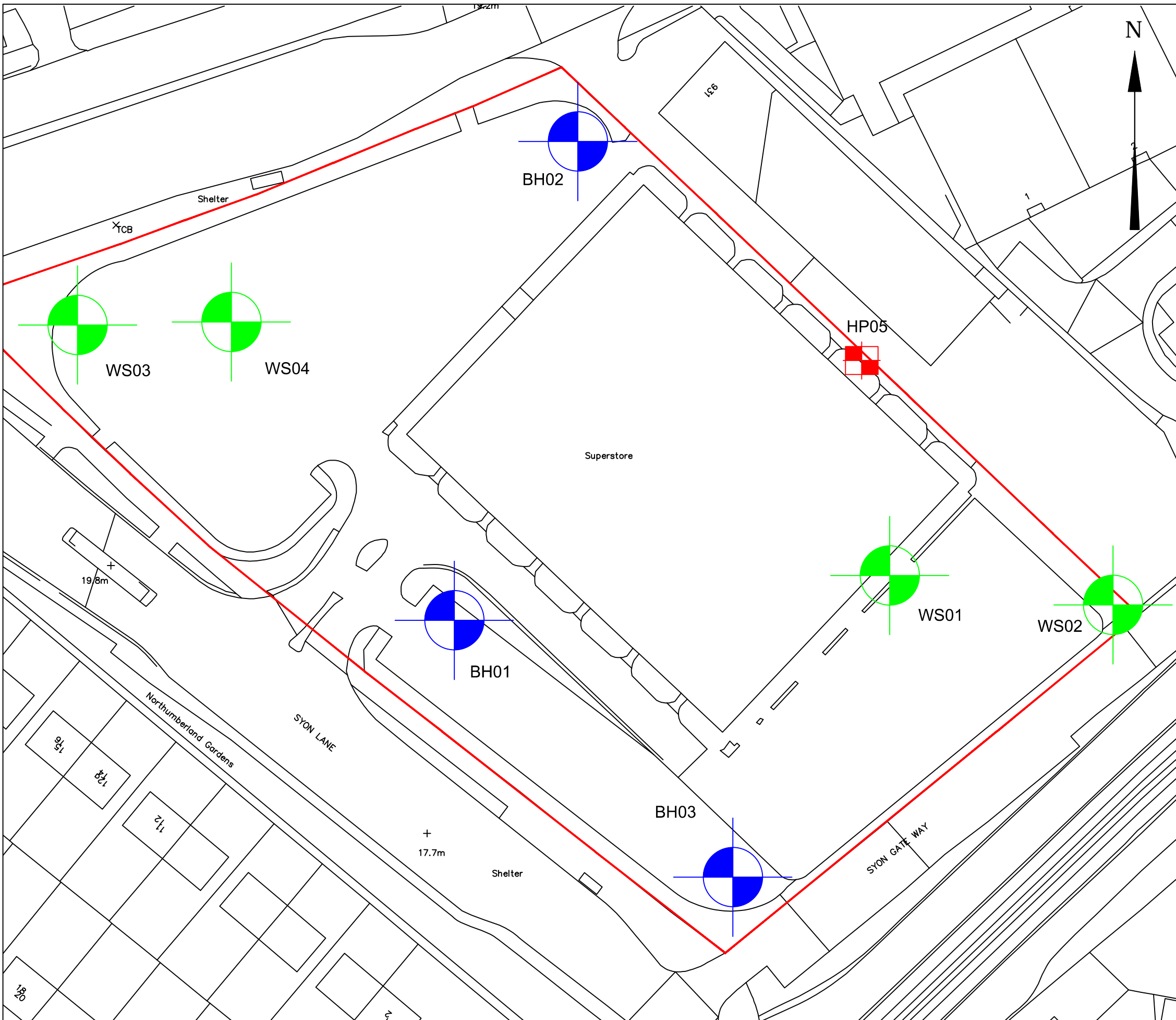
GEOTECHNICAL ENGINEERING LIMITED






4. REFERENCES

British Standards Institution (2015): Code of practice for ground investigations. BS 5930:2015.

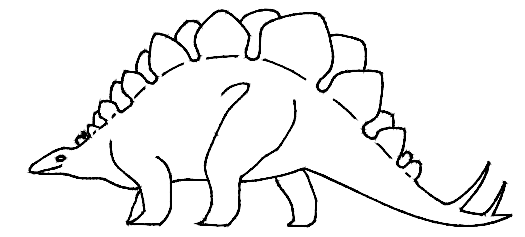
British Standards Institution (2012): Geotechnical investigation and testing. Field testing. Standard penetration test. BS EN ISO 22476-3:2005+A1:2011.



Key:

	Borehole Location
	Trial Pit Location
	Dynamic Sampler Borehole Location

Notes:
 Drawing supplied by Client.



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 Centurion House, Olympus Park, Quedgeley, Gloucester GL2 4NF
 Telephone: (01452) 527743 Facsimile: (01452) 729314
 E-mail: geotech@geoeng.co.uk Web: www.geoeng.co.uk

Client:
 WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

Consultant:
 WATERMANS

Site:
 WIE15328, HOMEBASE, ISLEWORTH

Title:
 Exploratory Hole Location Plan

Drawn By:	BC	Checked By:	EC	Paper Size:	A3
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Scale:	1:750	Date:	Nov 2018
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Contract:	34740	Figure:	01
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APPENDIX A

FIELDWORK DATA

**Sample type**

D Small disturbed	U Undisturbed	L Dynamic	ES Environmental - soil	Cs Core subsample (prepared)
B Bulk disturbed	UT Undisturbed thin wall	C Core	EW Environmental - water	Ls Dynamic subsample (prepared)
LB Large bulk disturbed	P Piston	W Water		

Test type

S SPT - Split spoon sampler followed by uncorrected SPT 'N' Value

C SPT - Solid cone followed by uncorrected SPT 'N' Value

(*250 - Where full test drive not completed, linearly extrapolated 'N' value reported, ** - Denotes no effective penetration)

H Hand vane - direct reading in kPa - not corrected for BS1377 (1990). Re* denotes refusal

M Mackintosh probe - number of blows to achieve 100mm penetration

Mx Mexe cone - average reading of equivalent CBR value in %

PP Pocket penetrometer - direct reading in kg/sq.cm

Vo Headspace vapour reading, uncorrected peak values in ppm, using a PID (calibrated with Isobutylene, using a 10.6eV bulb)

Sample/core range/l_r

| Dynamic sample

|

█ Undisturbed sample - open drive including thin wall. Symbol length reflects recovery

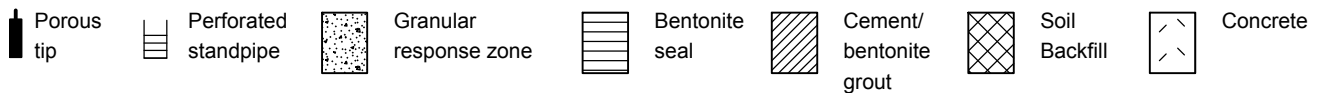
x x = Total Core Recovery (TCR) as percentage of core run

y y = Solid Core Recovery (SCR) as percentage of core run. Assessment of core is based on full diameter.

z z = Rock Quality Designation (RQD). The amount of solid core greater than 100mm expressed as percentage of core run.

Where SPT has been carried out at beginning of core run, disturbed section of core excluded from SCR and RQD assessment.

l_r - fracture spacing - the modal fracture spacing (mm) over the indicated length of core. Where spacing varies significantly, the minimum, mode and maximum values are given. NI = non-intact core NA = not applicable

Instrumentation**Stratum boundaries****Logging**

The logging of soils and rocks has been carried out in general accordance with BS 5930:2015.

Chalk is logged in general accordance with Lord et al (2002) CIRIA C574. Where possible, dynamic samples in chalk have been logged in accordance with CIRIA C574; descriptions and gradings (if presented) should be treated with caution given the potential for sample disturbance.

For rocks the term fracture has been used to identify a mechanical break within the core. Where possible incipient and drilling induced fractures have been excluded from the assessment of fracture state. Where doubt exists, a note has been made in the descriptions. All fractures are considered to be continuous unless otherwise reported.

Made Ground is readily identifiable when, within the material make up, man made constituents are evident. Where Made Ground appears to be reworked natural material the differentiation between in situ natural deposits and Made Ground is much more difficult to ascertain. The interpretation of Made Ground within the logs should therefore be treated with caution.

The descriptors "topsoil" and "tarmacadam" are used as generic terms and do not imply conformation to any particular standard or composition.

Rootlets are defined as being less than 2mm in diameter, roots are defined as in excess of 2mm diameter.

General Comments

The process of drilling and sampling will inevitably lead to disturbance, mixing or loss of material in some soil and rocks.

Indicated water levels are those recorded during the process of drilling or excavating exploratory holes and may not represent standing water levels.

All depths are measured along the axis of the borehole and are related to ground level at the point of entry. All inclinations are measured normal to the axis of the core.

Where provided, the stratigraphic names/geological rock units are for guidance only and may not be wholly accurate.

BOREHOLE LOG



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

BH01

SITE WIE15238- HOMEBASE, ISLEWORTH

Sheet 1 of 2

Start Date 6 November 2018 Easting 516384

Scale 1 : 50

End Date 13 November 2018 Northing 177304 Ground level 18.70mOD

Depth 15.45 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	lf	instru -ment	description	depth (m)	reduced level (m)	legend
06/11/18 1525hrs Dry	C	0.00 - 0.05			100			MADE GROUND comprising black TARMACADAM.	0.06	18.64	
	1B	0.05 - 0.20							0.20	18.50	
	C	0.20 - 0.60			100			Pinkish brown slightly silty sandy GRAVEL. Gravel is angular to subrounded fine to coarse flint, quartzite, brick, charcoal and tarmacadam. (MADE GROUND)	0.60	18.10	
	2B	0.50 - 0.70							0.80	17.90	
	1ES	0.50 - 0.70									
	2ES	0.75 - 1.00						MADE GROUND comprising dark grey and grey reinforced CONCRETE with steel reinforcement rods (2mm diam).	1.10	17.60	
06/11/18 1735hrs 1.00m	3B	0.75 - 1.00									
	3ES	1.00 - 1.20						Dark brown slightly silty slightly sandy GRAVEL with frequent wood fragments (up to 30mm). Gravel is angular to subrounded fine to coarse concrete, flint and brick. (MADE GROUND)	2.20	16.50	
07/11/18 1220hrs 1.00m	4B	1.00 - 1.20									
	5D	1.20 - 1.65	2.20	S*115				0.60m: 10mm plywood board.	2.60	16.10	
07/11/18 1735hrs 1.00m	6L	1.20 - 2.20							2.75	15.95	
	7D	2.20 - 2.48						Brown slightly silty gravelly medium and coarse SAND with a low subrounded and subangular brick and cobble content and rare wood fragments (up to 50mm). Gravel is angular to subrounded fine to coarse concrete, flint, brick, quartzite and crystalline. (MADE GROUND)			
08/11/18 0800hrs 1.00m	8L	2.20 - 2.60						1.00 - 1.10m: Grey concrete with steel rebar (5mm diam).			
	9C	2.60 - 3.90			15	NA		Medium dense brown silty sandy GRAVEL with a rare concrete and brick cobble content. Gravel is angular to rounded fine to coarse concrete, brick and flint. (MADE GROUND)	3.90	14.80	
08/11/18 1710hrs 1.00m	4ES	3.90 - 4.10		Vo 0.0					4.20	14.50	
	10L	3.90 - 4.50	2.50					Very dense black and dark blue silty sandy GRAVEL. Gravel is subangular and angular fine to coarse concrete, flint, plywood, nails (3mm diam) and probable sulphurous slag. Sulphurous odour. (MADE GROUND)	4.50	14.20	
08/11/18 1710hrs 1.00m	11D	4.50 - 4.95	4.00	S 11				MADE GROUND comprising grey CONCRETE with steel reinforcement rods (8mm diam). (MADE GROUND)			
	C	4.50 - 5.50	4.50		0	NA		NO RECOVERY. Assessed zone of core loss due to concrete scrubbing the remainder of the run.			
09/11/18 1020hrs 1.00m								Brown slightly silty gravelly coarse SAND with a low subrounded flint cobble content. Gravel is angular to subrounded fine to coarse flint.			
	C	5.50 - 6.50	5.50		0			Firm indistinctly structured dark brownish grey silty CLAY.			
09/11/18 1020hrs 1.00m	5ES	6.00 - 6.20		Vo 0.0				NO RECOVERY.			
	12D	6.50 - 6.95	5.50	S 13					6.50	12.20	
	13C	6.50 - 7.50			85			Firm becoming stiff indistinctly structured dark brownish grey silty CLAY with rare pyritic silt partings and rare dark bluish grey silty fine sand pockets (up to 30mm). Rare shell fragments (up to 3mm).			
	14D	7.50 - 7.95	5.70	S 16							
	15C	7.50 - 9.00			100						
Continued Next Page									{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.
 METHOD: Rotary core drilled (300mm) 0.00-0.05m and 0.20-0.60m. Hand dug inspection pit 0.05-0.20m and 0.60-1.20m. Dynamic sampled (128mm) 1.20-2.60m and (113mm) 3.90-4.50m. Waterflush rotary core drilled (146mm) 2.60-3.90m and 4.50-15.00m.
 CASING: 168mm diam to 5.70m.
 BACKFILL: On completion, borehole backfilled with bentonite pellets 15.45-5.00m. A slotted standpipe (50mm) was installed at 5.00m, granular response zone 5.00-3.00m, bentonite seal 3.00-0.50m, gravel drainage 0.50-0.30m, concrete 0.30-0.10m, tarmacadam and stopcock cover 0.10-0.00m.
 REMARKS: Downhole magnetometry for UXO risk mitigation carried out 0.00-6.45m. No anomalies encountered.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks	AGS	CONTRACT 34740	CHECKED CT
				Groundwater not encountered prior to use of water flush.			

BOREHOLE LOG



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

BH01

SITE WIE15238- HOMEBASE, ISLEWORTH

Sheet 2 of 2

Start Date 6 November 2018 Easting 516384

Scale 1 : 50

End Date 13 November 2018 Northing 177304 Ground level 18.70mOD

Depth 15.45 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	lf	instru -ment	description	depth (m)	reduced level (m)	legend
09/11/18 1500hrs 2.00m	6ES	8.00 - 8.20		Vo 0.0							
	7ES	8.70 - 8.90		Vo 0.0							
12/11/18 0920hrs 2.00m	16D	9.00 - 9.45	5.70	S 19		66					
	17C	9.00 - 10.50									
	8ES	9.70 - 9.90		Vo 0.0							
	18C	10.50 - 12.00	5.70			93					
	19D	12.00 - 12.45	5.70	S 21		80 100 NA		Medium strong dark grey stained reddish and yellowish brown calcareous MUDSTONE with subvertical and subhorizontal calcite veins (up to 10mm diam). 11.80m: Subhorizontal stepped smooth fracture.	11.70 11.90	7.00 6.80	
	20C	12.00 - 13.50				97		Stiff indistinctly structured dark brownish grey silty CLAY with rare pyritic silt partings and rare dark bluish grey silty fine sand pockets (up to 30mm). Rare shell fragments (up to 3mm).			
	21C	13.50 - 15.00	5.70			100					
12/11/18 1700hrs 3.00m	22D	15.00 - 15.45	5.70	S 26					15.45	3.25	
Borehole completed at 15.45m.									{18.00}		

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water strike (m) casing (m) rose to (m) time to rise (m) remarks
Groundwater not encountered prior to use of water flush.



CONTRACT
34740

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CT

BOREHOLE LOG



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

BH03

SITE WIE15238- HOMEBASE, ISLEWORTH

Sheet 1 of 1

Start Date 13 November 2018 Easting 516431

Scale 1 : 50

End Date 13 November 2018 Northing 177261 Ground level 16.70mOD

Depth 5.65 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	instru -ment	description	depth (m)	reduced level (m)	legend	
13/11/18 1130hrs	C	0.00 - 0.05			100		MADE GROUND comprising black TARMACADAM.	0.05	16.65		
	1B	0.05 - 0.20						0.20	16.50		
	1ES	0.05 - 0.20		Vo 0.0			Pinkish brown slightly silty sandy GRAVEL. Gravel is angular to subrounded fine to coarse flint, quartzite, brick, charcoal and tarmacadam. (MADE GROUND)	0.50	16.20		
	2B	0.30 - 0.50									
	2ES	0.30 - 0.50		Vo 1.9							
	3B	0.70 - 0.90									
	3ES	0.70 - 0.90		Vo 0.0			Greyish brown slightly silty sandy GRAVEL. Gravel is subangular and subrounded fine to coarse concrete, flint, brick and tarmacadam. (MADE GROUND)	0.90	15.80		
	4B	1.00 - 1.20									
	4ES	1.00 - 1.20		Vo 0.0							
	5D	1.20 - 1.65		Nil	S 2		Reddish brown and dark grey silty gravelly medium SAND with frequent dark grey silty clay pockets (up to 20mm). Gravel is angular to subrounded fine to coarse concrete, flint, brick and tarmacadam. (MADE GROUND)	1.70	15.00		
	6L	1.20 - 1.70									
	5ES	1.50 - 1.70		Vo 0.0		40			1.90	14.80	
	7C	1.70 - 2.20		Nil							
13/11/18 1525hrs 1.00m	8D	2.20 - 2.65		Nil	S 7		Very loose brown and yellowish brown slightly silty sandy GRAVEL with a rare angular and subangular brick and concrete cobble content. Gravel is angular and subangular fine to coarse concrete, flint and brick. (MADE GROUND)	2.20	14.50		
	9L	2.20 - 3.20									
	6ES	2.20 - 2.40		Vo 0.0			1.50 - 1.70m: Reddish brown porcelain piping and red pocelain tiles.				
	7ES	2.70 - 2.90		Vo 0.0							
	10D	3.20 - 3.65	3.10	H 85							
	11L	3.20 - 4.20		S 30			MADE GROUND comprising grey CONCRETE.				
	8ES	3.50 - 3.70		Vo 0.0			Assessed zone of core loss due to concrete scrubbing the sample.				
	9ES	3.90		H 110							
	12D	4.20 - 4.65	3.10	Vo 0.0			Soft locally stiff orangish brown and brown mottled bluish grey slightly sandy silty CLAY with frequent pockets of white calcareous silt (up to 30mm) and orangish brown silt (up to 70mm). 2.70m: Becoming brown and brownish grey.	3.90	12.80		
	13L	4.20 - 5.20		S 10			Firm locally stiff dark grey silty CLAY with frequent pockets of dark bluish grey silt (up to 30mm).				
		4.80		H*Re							
	14D	5.20 - 5.65	3.10	S 10				5.65	11.05		
							Borehole completed at 5.65m.				

EQUIPMENT: Geotechnical Pioneer rig.
 METHOD: Rotary core drilled (300mm) 0.00-0.05m. Hand dug inspection pit 0.05-1.20m. Dynamic sampled (128mm) 1.20-1.70m. Waterflush rotary core drilled (146mm) 1.70-2.20m. Dynamic sampled (128mm) 2.20-3.20m, (113mm) 3.20-4.20m and (98mm) 4.20-5.20m.
 CASING: 168mm diam to 3.10m.
 BACKFILL: On completion, borehole backfilled with bentonite pellets 5.65-1.70m. A slotted standpipe (50mm) was installed at 1.70m, granular response zone 1.70-0.50m, bentonite seal 0.50-0.30m, concrete 0.30-0.10m, tarmacadam and stopcock cover 0.10-0.00m.
 REMARKS: Downhole magnetometry for UXO risk mitigation carried out 0.00-5.65m. No anomalies encountered.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks		CONTRACT 34740	CHECKED CT
				Groundwater not encountered prior to use of water flush.			

BOREHOLE LOG



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

WS01

SITE WIE15238- HOMEBASE, ISLEWORTH

Sheet 1 of 1

Start Date 1 November 2018

Scale 1 : 50

End Date 1 November 2018

Depth 2.05 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	instru -ment	description	depth (m)	reduced level (m)	legend
01/11/18 0830hrs	1B 1ES	0.10 - 0.30 0.10 - 0.30		Vo 0.0		/ /	MADE GROUND comprising black and grey TARMACADAM.	0.05		
	2B 2ES	0.70 - 0.90 0.70 - 0.90		Vo 0.0			Reddish brown slightly clayey gravelly fine to coarse SAND with a medium angular and subangular concrete cobble content. Gravel is subangular to rounded fine to coarse flint, concrete and brick. Rare wood fragments (up to 100mm). (MADE GROUND)	0.70		
	3B 3ES	1.00 - 1.20 1.00 - 1.20		Vo 0.0						
	4D 5L	1.20 - 1.58 1.20 - 1.60	Nil	S*65			Very dense brown slightly sandy gravelly SILT. Gravel is subrounded and rounded fine and medium flint. 1.45 - 1.60m: Very dense light grey slightly gravelly sandy silt. Gravel is subangular and subrounded fine flint.			
01/11/18 1130hrs Dry	4ES 6D	1.50 - 1.60 1.60 - 2.05	Nil	Vo 0.0 S 71				2.05		
							Borehole completed at 2.05m.			
								{8.00}		

EQUIPMENT: Geotechnical Terrier 2000 rig.
 METHOD: Hydraulic breaker 0.00-0.05m. Hand dug inspection pit 0.05-1.20m. Dynamic sampled (98mm) 1.20-1.60m.
 CASING: None used.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 1.60m, granular response zone 2.05-0.50m, bentonite seal 0.50-0.20m, concrete and stopcock cover 0.20-0.00m.
 REMARKS: Position unable to be surveyed due to overhead obstructions.
 Borehole terminated at 2.05m due to SPT refusal.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks		CONTRACT 34740	CHECKED CT
1.20		1.20	20	Groundwater in base of pit.			

BOREHOLE LOG



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

WS02

SITE WIE15238- HOMEBASE, ISLEWORTH

Sheet 1 of 1

Start Date 1 November 2018 Easting 516495

Scale 1 : 50

End Date 2 November 2018 Northing 177307 Ground level 15.00mOD

Depth 5.00 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	instru -ment	description	depth (m)	reduced level (m)	legend	
01/11/18 1330hrs	1B	0.10 - 0.30				/	MADE GROUND comprising black locally grey TARMACADAM.	0.05	14.95		
	1ES	0.10 - 0.30		Vo 0.0							
	2B	0.60 - 0.80					Reddish brown slightly clayey sandy subangular to rounded fine to coarse flint, brick and concrete GRAVEL. (MADE GROUND)	0.60	14.40		
	2ES	0.60 - 0.80		Vo 0.0							
	3B	1.00 - 1.20					Soft dark grey slightly gravelly clayey SILT. Gravel is subangular and subrounded fine and medium flint. (MADE GROUND)	1.00	14.00		
	3ES	1.00 - 1.20		Vo 28.8							
	4D	1.20 - 1.65		Nil	S 69						
	5L	1.20 - 2.00		1.20							
	4ES	1.80 - 2.00					Very dense dark greenish grey slightly gravelly SILT with frequent pockets (up to 60mm) of partially decomposed organic material and thin black silt laminae. Gravel is subangular to rounded fine and medium flint, concrete and brick. (MADE GROUND)	2.10	12.90		
	6D	2.00 - 2.45		2.00	Vo 3.3	S 31		1.00 - 2.10m: Hydrocarbon (diesel) odour.			
	7L	2.00 - 3.00									
01/11/18 1730hrs Dry	5ES	2.60 - 2.90					Dense dark greenish grey slightly gravelly SILT with frequent fragments (up to 40mm) of partially decomposed organic material and pockets (up to 70mm) of black silt. Strong organic odour.	2.90	12.10		
	8D	3.00 - 3.45									
	9L	3.00 - 4.00		3.00	Vo 22.8	S 29					
	6ES	3.80 - 4.00					Stiff to very stiff light brown locally light grey and orangish brown silty CLAY with rare fragments (up to 1mm) of pyrite. Frequent relict rootlets.				
	10D	4.00 - 4.45		4.00	Vo 0.4	S 27		4.30 - 4.40m: Soft dark grey clay. Strong organic odour.			
	11L	4.00 - 5.00									
	7ES	4.80 - 5.00					4.90 - 5.00m: Frequent shell fragments (up to 5mm).	5.00	10.00		
		5.00 - 5.45	5.00	Vo 0.0	S 33		Borehole completed at 5.00m.				

EQUIPMENT: Geotechnical Terrier 2000 rig.
 METHOD: Hydraulic breaker 0.00-0.05m. Hand dug inspection pit 0.05-1.20m. Dynamic sampled (98mm) 1.20-5.00m.
 CASING: 113mm diam to 5.00m
 BACKFILL: On 2/11/18, a slotted standpipe (50mm) was installed to 5.00m, granular response zone 5.00-0.50m, bentonite seal 0.50-0.20m, concrete and stopcock cover 0.20-0.00m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks		CONTRACT 34740	CHECKED CT
				Groundwater not encountered.			

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BOREHOLE LOG



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

WS03

SITE WIE15238- HOMEBASE, ISLEWORTH

Sheet 1 of 1

Start Date 5 November 2018 Easting 516320

Scale 1 : 50

End Date 5 November 2018 Northing 177354 Ground level 19.95mOD

Depth 1.57 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	instru-ment	description	depth (m)	reduced level (m)	legend
05/11/18 1520hrs	C	0.00 - 0.05			100	/ /	MADE GROUND comprising black and light grey TARMACADAM.	0.05	19.90	
	1B	0.15 - 0.30		Vo 0.1				0.30	19.65	
	1ES	0.15 - 0.20								
	2B	0.30 - 0.60		Vo 0.1			Dark brown and reddish brown gravelly medium and coarse SAND with a medium angular and subangular cobble content. Gravel is angular to subrounded fine to coarse flint, concrete and tarmacadam. (MADE GROUND)	0.80	19.15	
	2ES	0.30 - 0.50								
05/11/18 1730hrs Dry	3ES	0.80 - 1.00								
	3D	1.20 - 1.57	Nil	S*70			Brown and light brown slightly silty gravelly medium and coarse SAND with a low angular and subangular concrete cobble content. Gravel is angular to subrounded fine to coarse flint, sandstone and brick. Frequent (30x30mm) dark grey clay pockets. (MADE GROUND)	1.57	18.38	
							Very dense brown slightly clayey slightly gravelly fine and medium SAND. Gravel is angular to subrounded fine to coarse flint.			
							Borehole completed at 1.57m.			
								{8.00}		

EQUIPMENT: Geotechnical Terrier 2000 rig.
 METHOD: Rotary core drilled (300mm) 0.00-0.05m. Hand dug inspection pit 0.05-1.20m.
 CASING: None used.
 BACKFILL: On completion, a slotted standpipe (50mm) was installed to 1.20m, granular response zone 1.20-0.50m, bentonite seal 0.50-0.20m, concrete and stopcock cover 0.20-0.00m.
 REMARKS: Borehole terminated at 1.57m due to SPT refusal.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m) casing (m) rose to (m) time to rise (min) remarks
 Groundwater not encountered.



CONTRACT
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BOREHOLE LOG



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

WS04

SITE WIE15238- HOMEBASE, ISLEWORTH

Sheet 1 of 1

Start Date 5 November 2018 Easting 516346

Scale 1 : 50

End Date 5 November 2018 Northing 177355 Ground level 20.15mOD

Depth 1.47 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	instru -ment	description	depth (m)	reduced level (m)	legend
05/11/18 0920hrs	1B 1ES	0.10 - 0.30 0.20 - 0.30		Vo 0.0			MADE GROUND comprising black and light grey TARMACADAM.	0.10	20.05	
	2B 2ES	0.50 - 0.70 0.55 - 0.65		Vo 0.0			Reddish brown becoming brown slightly silty sandy GRAVEL with a medium angular and subangular concrete cobble content. Gravel is angular to rounded fine to coarse flint, crystalline and tarmacadam. (MADE GROUND)	0.50 0.80	19.65 19.35	
05/11/18 1020hrs Dry	3ES 3D	1.10 - 1.20 1.20 - 1.47	Nil	S*130			0.30 - 0.50m: Frequent brick fragments (up to 30x30mm). 0.45m: Rare metal fragments (100x50mm). Yellowish brown and reddish brown slightly silty gravelly fine to coarse SAND with a medium angular and subangular concrete cobble content. Gravel is rounded to angular fine to coarse flint, concrete, brick and tarmacadam. (MADE GROUND) Very dense dark brown locally black slightly clayey gravelly coarse SAND. Gravel is subrounded to angular fine and medium flint and quartzite. Borehole completed at 1.47m.	1.47	18.68	
								{8.00}		

EQUIPMENT: Geotechnical Terrier 2000 rig.
 METHOD: Hydraulic breaker 0.00-0.05m. Hand dug inspection pit 0.05-1.20m.
 CASING: None used.
 BACKFILL: On completion, hole backfilled bentonite pellets and local materials.
 REMARKS: Borehole terminated at 1.47m due to SPT refusal.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m) casing (m) rose to (m) time to rise (min) remarks



CONTRACT
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STANDARD PENETRATION TEST



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

SITE WIE15238- HOMEBASE, ISLEWORTH

borehole no.	borehole depth (m)	s.w.p (m)	bottom depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio (%)						
						blows	pen (mm)	blows		pen (mm)										
BH01	1.20		1.65	Nil	Dry	4	7	75	75	8	7	6	8	75	75	75	75	S	29	78
BH01	2.20		2.48	2.20	1.50	5	7	75	75	8	42			75	55			S	115	78
BH01	4.50		4.95	4.00	0.50	2	2	75	75	2	3	3	3	75	75	75	75	S	11	78
BH01	6.50		6.95	5.50	1.50	2	2	75	75	3	3	3	4	75	75	75	75	S	13	78
BH01	7.50		7.95	5.70	1.50	2	2	75	75	4	3	4	5	75	75	75	75	S	16	78
BH01	9.00		9.45	5.70	1.60	3	3	75	75	3	3	5	8	75	75	75	75	S	19	78
BH01	12.00		12.45	5.70	3.00	3	4	75	75	4	5	5	7	75	75	75	75	S	21	78
BH01	15.00		15.45	5.70	3.00	4	4	75	75	5	7	7	7	75	75	75	75	S	26	78
BH02	1.20		1.63	Nil	Dry	5	14	75	75	13	17	17	3	75	75	75	50	S	55	78
BH02	2.20		2.65	2.20	0.50	2	7	75	75	9	11	13	12	75	75	75	75	S	45	78
BH02	3.20		3.65	3.20	1.00	1	2	75	75	2	6	14	14	75	75	75	75	S	36	78
BH02	4.20		4.65	4.20	1.00	1	1	75	75	2	3	3	3	75	75	75	75	S	11	78
BH02	5.00		5.45	4.20	1.00	2	1	75	75	2	3	3	3	75	75	75	75	S	11	78
BH03	1.20		1.65	Nil	Dry	2	2	75	75	1	1	0	0	75	75	75	75	S	2	78
BH03	2.20		2.65	Nil	1.00	1	1	75	75	1	2	1	3	75	75	75	75	S	7	78
BH03	3.20		3.65	3.10	0.40	5	7	75	75	9	7	7	7	75	75	75	75	S	30	78
BH03	4.20		4.65	3.10	1.00	1	1	75	75	1	3	2	4	75	75	75	75	S	10	78
BH03	5.20		5.65	3.10	1.00	1	1	75	75	1	2	3	4	75	75	75	75	S	10	78
WS01	1.20		1.58	Nil	Dry	1	2	75	75	4	20	18	8	75	75	75	5	S	65	70
WS01	1.60		2.05	Nil	Dry	3	7	75	75	16	20	20	15	75	75	75	75	S	71	70
WS02	1.20		1.65	Nil	Dry	1	5	75	75	14	15	20	20	75	75	75	75	S	69	70
WS02	2.00		2.45	2.00	Dry	5	6	75	75	7	7	8	9	75	75	75	75	S	31	70
WS02	3.00		3.45	3.00	Dry	5	6	75	75	8	8	7	6	75	75	75	75	S	29	70
WS02	4.00		4.45	4.00	Dry	2	4	75	75	5	7	7	8	75	75	75	75	S	27	70

notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

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STANDARD PENETRATION TEST



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

SITE WIE15238- HOMEBASE, ISLEWORTH

borehole no.	borehole depth (m)	s.w.p (m)	bottom depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio (%)
						blows	pen (mm)	blows		pen (mm)				
WS02	5.00		5.45	5.00	Dry	7 8	75 75	7 9 8 9	75 75 75 75	S	33	70		
WS03	1.20		1.57	Nil	Dry	13 15	75 75	16 19 15	75 75 65	S	70	70		
WS04	1.20		1.47	Nil	Dry	11 27	75 75	34 16	75 40	S	130	70		

notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT 34740	CHECKED CT
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TRIAL PIT LOG



CLIENT WATERMAN INFRASTRUCTURE AND ENVIRONMENT LTD

HP05

SITE WIE15238- HOMEBASE, ISLEWORTH

Sheet 1 of 1

Start Date 6 November 2018 Easting 516453

Scale 1 : 25

End Date 6 November 2018 Northing 177348 Ground level 24.50mOD

Depth 1.20 m

water record	sample/test			description	depth (m)	level (m)	legend
	no/type	result	depth (m)				
Dry.				MADE GROUND comprising black and light grey TARMACADAM.	0.15	24.35	
	1B	Vo 0.0	0.15- 0.25	Reddish brown and light brown slightly silty slightly sandy angular and subrounded fine to coarse flint, concrete, tarmacadam and crystalline GRAVEL with a medium angular and subangular concrete cobble content. (MADE GROUND)	0.25	24.25	
	1ES		0.20- 0.25				
	2B	Vo 0.0	0.25- 0.40	Brown and light brown slightly silty gravelly medium and coarse SAND with a low angular and subangular concrete cobble content. Gravel is angular to subrounded fine to coarse flint, brick, concrete, tarmacadam and crystalline. Rare roots (up to 30mm diam) and rootlets. (MADE GROUND)			
	2ES		0.25- 0.30				
	3B		0.80- 1.00	0.25 - 0.35m: Frequent brick fragments (up to 100x30mm).			
3ES		0.80- 1.00	0.40m: Steel reinforcement bar (200x20mm).				
					1.20	23.30	
				Trial pit completed at 1.20m.			

Notes

Trial pit excavated using hand tools and hydraulic breaker.
 Groundwater was not encountered.
 Trial pit dimensions 0.30x0.30x1.20m.
 Trial pit sides remained stable.
 On completion, the trial pit was backfilled and the surface reinstated.

Sketch of Foundation - Not to scale. All dimensions in metres.

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EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS



CONTRACT	CHECKED
34740	CT

Appendix D

Third Party Correspondence

- **Groundsure Enviro Insight Report (Report Ref. ref: WTM1-5522777)**
- **Groundsure Geo Insight Report (Report Ref. WTM1-5522778)**
- **Groundsure Historical Map Pack**
- **London Borough of Hounslow Land Quality Team records**
- **LFEPA Petroleum Section Records**



Waterman Infrastructure & Environment
Limited

PICKFORDS WHARF WATERMAN GROUP,
CLINK STREET,
LONDON, SE1 9DG

Groundsure Reference: WTM1-5522777

Your Reference: 93632

Report Date 11 Oct 2018

Report Delivery Method: Email - pdf

Enviro Insight

Address: HOMEBASE, 67, SYON LANE, ISLEWORTH, TW7 5QE

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159 000, queries: info@groundsure.com quoting the above report reference number

Yours faithfully,

Waterman

Enc.
Groundsure Enviroinsight

Address: HOMEBASE, 67, SYON LANE, ISLEWORTH, TW7 5QE
Date: 11 Oct 2018
Reference: WTM1-5522777
Client: Waterman Infrastructure & Environment Limited

NW

N

NE



W

E

SW

S

SE

Aerial Photograph Capture date: 20-Apr-2015
Grid Reference: 516415,177325
Site Size: 1.46ha

Report Reference: WTM1-5522777
Client Reference: 93632

Contents Page

Contents Page	3
Overview of Findings	6
Using this report	10
1. Historical Land Use	11
1. Historical Industrial Sites	12
1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping	12
1.2 Additional Information – Historical Tank Database	16
1.3 Additional Information – Historical Energy Features Database	17
1.4 Additional Information – Historical Petrol and Fuel Site Database	19
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	19
1.6 Historical military sites	19
1.7 Potentially Infilled Land	19
2. Environmental Permits, Incidents and Registers Map	22
2. Environmental Permits, Incidents and Registers	23
2.1 Industrial Sites Holding Licences and/or Authorisations	23
2.1.1 Records of historic IPC Authorisations within 500m of the study site	23
2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site	23
2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site	24
2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site	24
2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site	24
2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site	24
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	25
2.1.8 Records of Licensed Discharge Consents within 500m of the study site	25
2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site	25
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	25
2.2 Dangerous or Hazardous Sites	26
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents	26
2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site	26
2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site	26
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	26
3. Landfill and Other Waste Sites Map	27
3. Landfill and Other Waste Sites	28
3.1 Landfill Sites	28
3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site	28
3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site	28
3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site	29
3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site	29
3.2 Other Waste Sites	29
3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site	29
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site	30
4. Current Land Use Map	33
4. Current Land Uses	34
4.1 Current Industrial Data	34
4.2 Petrol and Fuel Sites	35
4.3 National Grid High Voltage Underground Electricity Transmission Cables	36
4.4 National Grid High Pressure Gas Transmission Pipelines	36

5. Geology	37
5.1 Artificial Ground and Made Ground.....	37
5.2 Superficial Ground and Drift Geology	37
5.3 Bedrock and Solid Geology	37
6 Hydrogeology and Hydrology	38
6a. Aquifer Within Superficial Geology	38
6b. Aquifer Within Bedrock Geology and Abstraction Licences	39
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences	40
6d. Hydrogeology – Source Protection Zones within confined aquifer	41
6e. Hydrology – Watercourse Network and River Quality	42
6.Hydrogeology and Hydrology	43
6.1 Aquifer within Superficial Deposits.....	43
6.2 Aquifer within Bedrock Deposits.....	43
6.3 Groundwater Abstraction Licences.....	44
6.4 Surface Water Abstraction Licences.....	45
6.5 Potable Water Abstraction Licences.....	45
6.6 Source Protection Zones.....	46
6.7 Source Protection Zones within Confined Aquifer.....	46
6.8 Groundwater Vulnerability and Soil Leaching Potential.....	46
6.9 River Quality.....	46
6.9.1 Biological Quality:.....	47
6.9.2 Chemical Quality:.....	47
6.10 Ordnance Survey MasterMap Water Network.....	47
6.11 Surface Water Features.....	48
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)	49
7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS)	50
Map	50
7 Flooding	51
7.1 River and Coastal Zone 2 Flooding.....	51
7.2 River and Coastal Zone 3 Flooding.....	51
7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating.....	51
7.4 Flood Defences.....	51
7.5 Areas benefiting from Flood Defences.....	51
7.6 Areas benefiting from Flood Storage.....	52
7.7 Groundwater Flooding Susceptibility Areas.....	52
7.8 Groundwater Flooding Confidence Areas.....	52
8. Designated Environmentally Sensitive Sites Map	53
8. Designated Environmentally Sensitive Sites	54
8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:.....	54
8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:.....	54
8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:.....	54
8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:.....	54
8.5 Records of Ramsar sites within 2000m of the study site:.....	54
8.6 Records of Ancient Woodland within 2000m of the study site:	55
8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:.....	55
8.8 Records of World Heritage Sites within 2000m of the study site:.....	55
8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:	55
8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:	55
8.11 Records of National Parks (NP) within 2000m of the study site:	56
8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:.....	56
8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:.....	56

8.14 Records of Green Belt land within 2000m of the study site:.....	56
9. Natural Hazards Findings	57
9.1 Detailed BGS GeoSure Data.....	57
9.1.1 Shrink Swell.....	57
9.1.2 Landslides.....	57
9.1.3 Soluble Rocks.....	57
9.1.4 Compressible Ground.....	58
9.1.5 Collapsible Rocks.....	58
9.1.6 Running Sand.....	58
9.2 Radon.....	59
9.2.1 Radon Affected Areas.....	59
9.2.2 Radon Protection.....	59
10. Mining	60
10.1 Coal Mining.....	60
10.2 Non-Coal Mining.....	60
10.3 Brine Affected Areas	60
Contact Details	61
Standard Terms and Conditions	63

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	12	34	43	72
1.2 Additional Information – Historical Tank Database	2	0	10	19
1.3 Additional Information – Historical Energy Features Database	0	0	27	42
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	4	2	0
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	11	17	18	16
Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	2
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	1	0	3	1
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	0	2
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	1
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	2	2	3
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	1
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	4	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	6	6	0

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	3	24	Not searched
4.2 Records of Petrol and Fuel Sites	0	1	1	1
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Records of Artificial Ground and Made Ground present beneath the study site	Identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	Identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m					
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	Identified					
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified					
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	4	3
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	3	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	#250GWV #	#500GWV #	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

0-500m

	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	Yes	No
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	0	0	0	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	No	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Environment Agency Zone 2 floodplains within 250m of the study site	None identified					
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	None identified					
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Very Low					
7.4 Flood Defences within 250m of the study site	None identified					
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified					
7.6 Areas used for Flood Storage within 250m of the study site	None identified					
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Potential below Surface					
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	High					

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	1
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	3
8.8 Records of World Heritage Sites	0	0	0	1	0	1
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	0	0	0	0	0	0
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards

9.1 Maximum risk of natural ground subsidence	Moderate
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site	Moderate
9.1.2 Maximum Landslides hazard rating identified on the study site	Very Low
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site	Negligible
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	Negligible
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site	Very Low
9.1.6 Maximum Running Sand hazard rating identified on the study site	Very Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining

10.1 Coal mining areas within 75m of the study site	None identified
10.2 Non-Coal Mining areas within 50m of the study site boundary	None identified
10.3 Brine affected areas within 75m of the study site	None identified

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licences, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

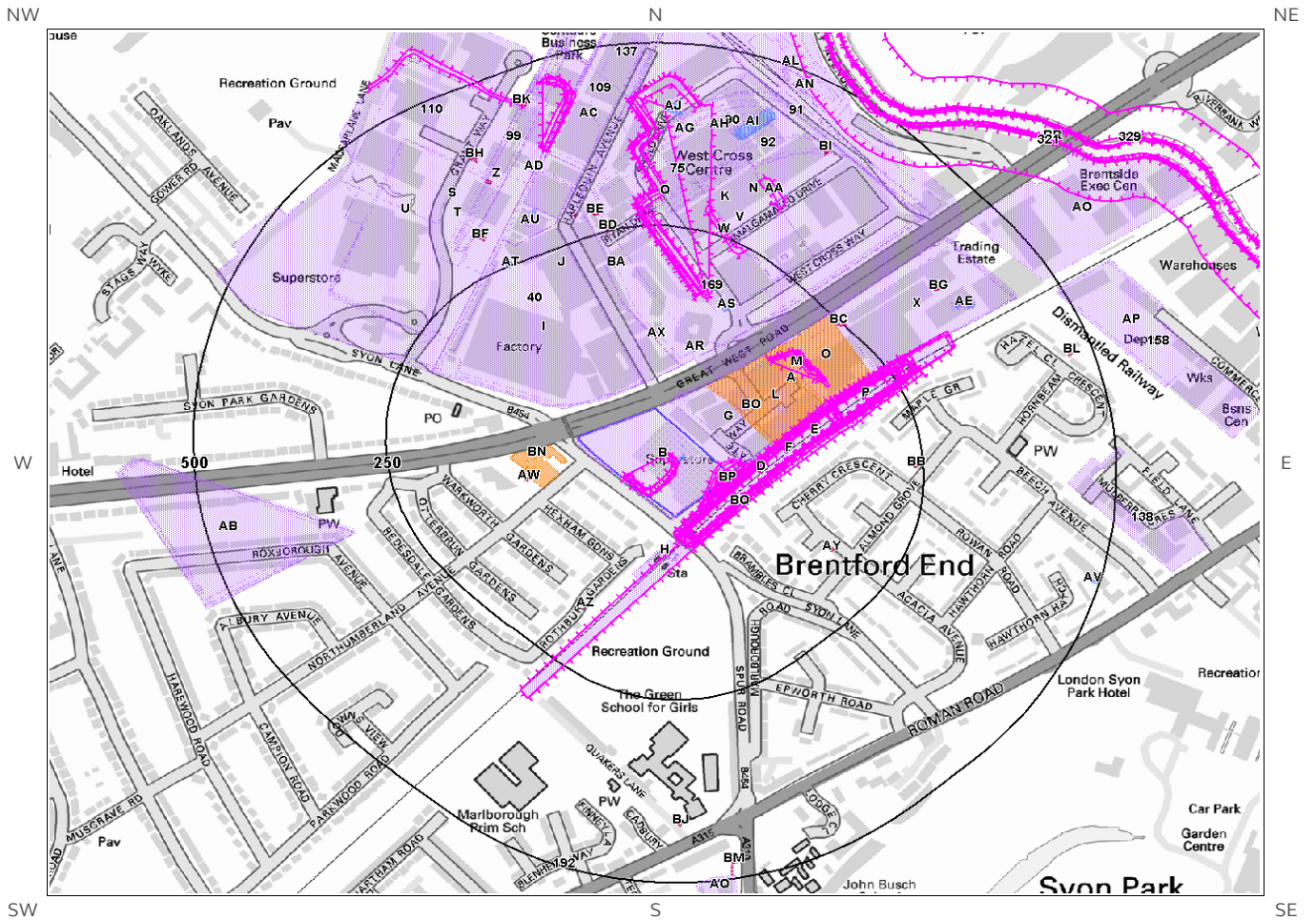
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

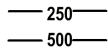
1. Historical Land Use



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Site Outline



Search Buffers (m)

Historical 1:10,000 and 1:10,560 scale mapping



Industrial Land Use



Potentially Infilled Land

Historical 1:2,500, 1:1,250 and 1:500 scale mapping



Energy Features



Petrol Stations



Tanks



Garages



Historical military sites

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 161

ID	Distance [m]	Direction	Use	Date
1A	0	On Site	Unspecified Commercial/Industrial	1948
2A	0	On Site	Unspecified Commercial/Industrial	1935
3G	0	On Site	Unspecified Commercial/Industrial	1961
4B	0	On Site	Unspecified Works	1966
5B	0	On Site	Unspecified Works	1974
6B	0	On Site	Unspecified Works	1987
7C	0	On Site	Unspecified Ground Workings	1948
8C	0	On Site	Unspecified Ground Workings	1948
9C	0	On Site	Unspecified Ground Workings	1935
10C	0	On Site	Unspecified Ground Workings	1935
11C	0	On Site	Unspecified Heap	1938
12A	0	On Site	Unspecified Commercial/Industrial	1948
13D	7	SE	Cuttings	1913
14D	7	SE	Cuttings	1933
15D	7	SE	Cuttings	1894
16E	8	SE	Cuttings	1974
17E	8	SE	Cuttings	1966
18E	8	SE	Cuttings	1987
19F	11	SE	Cuttings	1948
20F	11	SE	Cuttings	1948
21D	11	SE	Cuttings	1912
22D	11	SE	Cuttings	1938
23F	12	SE	Cuttings	1935
24D	12	SE	Cuttings	1961
25F	12	SE	Cuttings	1898
26F	15	SE	Cuttings	1896
27F	16	SE	Cuttings	1912
28F	17	SE	Cuttings	1894
29BQ	17	SE	Cuttings	1865

30BO	20	NE	Unspecified Commercial/Industrial	1987
31G	28	NE	Unspecified Factory	1974
32G	28	NE	Unspecified Factory	1966
33H	33	S	Railway Station	1948
34H	33	S	Railway Station	1948
35J	35	N	Unspecified Commercial/Industrial	1961
36I	36	N	Unspecified Factory	1974
37I	36	N	Unspecified Factory	1966
38J	37	N	Folding Boats Manufactory	1948
39J	37	N	Factory	1948
40	40	N	Unspecified Factory	1987
41H	46	S	Railway Station	1974
42H	46	S	Railway Station	1987
43H	46	S	Railway Building	1966
44H	50	S	Railway Station	1938
45H	50	S	Railway Building	1935
46H	50	S	Railway Station	1961
47H	54	SW	Railway Station	1935
48K	67	NE	Unspecified Factory	1961
49K	68	NE	Rubber Tyres Manufactory	1948
50K	68	NE	Factory	1948
51L	73	NE	Unspecified Works	1974
52L	73	NE	Unspecified Works	1966
53K	76	NE	Unspecified Factory	1966
54V	76	NE	Unspecified Factory	1974
55N	81	NE	Folding Boats Manufactory	1938
56M	148	NE	Unspecified Heap	1961
57M	150	NE	Unspecified Ground Workings	1948
58M	150	NE	Unspecified Ground Workings	1948
59N	151	NE	Rubber Tyres Manufactory	1935
60M	152	NE	Unspecified Ground Workings	1935
61M	152	NE	Unspecified Ground Workings	1935
62O	155	NE	Unspecified Works	1987
63O	155	NE	Unspecified Works	1974
64O	155	NE	Unspecified Works	1966
65P	159	NE	Cuttings	1894
66P	161	NE	Cuttings	1912
67Q	161	N	Unspecified Pit	1961
68P	163	NE	Cuttings	1913

69P	163	NE	Cuttings	1938
70Q	164	N	Unspecified Ground Workings	1948
71Q	164	N	Unspecified Ground Workings	1948
72R	165	N	Unspecified Ground Workings	1935
73R	165	N	Unspecified Ground Workings	1935
74P	165	NE	Cuttings	1933
75	168	N	Unspecified Ground Workings	1938
76S	199	NW	Unspecified Factory	1966
77S	199	NW	Unspecified Factory	1974
78T	209	NW	Biscuit Works	1935
79U	211	NW	Unspecified Works	1961
80T	212	NW	Biscuit Works	1938
81U	215	NW	Biscuit Works	1948
82U	215	NW	Works	1948
83X	228	NE	Unspecified Commercial/Industrial	1961
84V	231	NE	Unspecified Factory	1961
85V	232	NE	Rubber Tyres Manufactory	1938
86W	236	NE	Unspecified Ground Workings	1948
87W	236	NE	Unspecified Ground Workings	1948
88X	236	NE	Unspecified Factory	1966
89X	236	NE	Unspecified Factory	1974
90	253	N	Railway Sidings	1938
91	257	N	Railway Sidings	1935
92	258	N	Railway Sidings	1961
93Y	262	N	Railway Sidings	1948
94Y	262	N	Railway Sidings	1948
95Z	281	NW	Railway Sidings	1974
96Z	281	NW	Railway Sidings	1966
97AC	287	N	Unspecified Depot	1974
98AU	290	N	Unspecified Tank	1935
99	298	NW	Railway Sidings	1961
100AG	299	N	Railway Sidings	1966
101AH	307	N	Unspecified Commercial/Industrial	1938
102AA	316	NE	Unspecified Ground Workings	1948
103AA	316	NE	Unspecified Ground Workings	1948
104AB	317	SW	Nursery	1865
105AB	318	SW	Nursery	1894
106AB	320	SW	Nursery	1898

107AB	325	SW	Nursery	1896
108AB	328	W	Nursery	1894
109	340	N	Unspecified Depot	1966
110	343	NW	Unspecified Commercial/Industrial	1987
111AC	344	N	Unspecified Depot	1987
112AD	358	N	Chimney	1974
113AD	358	N	Chimney	1966
114AE	365	NE	Unspecified Tanks	1961
115AE	370	NE	Tanks	1948
116AE	370	NE	Tanks	1948
117AE	373	NE	Unspecified Tanks	1938
118AE	374	NE	Unspecified Tanks	1935
119AF	378	N	Unspecified Ground Workings	1935
120AF	378	N	Unspecified Ground Workings	1935
121AF	380	N	Unspecified Ground Workings	1938
122AG	382	N	Unspecified Tank	1966
123AH	382	N	Unspecified Tank	1974
124AI	382	N	Unspecified Tanks	1961
125AF	383	N	Unspecified Ground Workings	1948
126AF	383	N	Unspecified Ground Workings	1948
127AG	384	N	Unspecified Tank	1938
128AI	384	N	Unspecified Tanks	1966
129AI	384	N	Unspecified Tanks	1974
130AI	384	N	Unspecified Tanks	1935
131AI	385	N	Tanks	1948
132AI	385	N	Tanks	1948
133AI	386	N	Unspecified Tanks	1938
134AE	387	NE	Unspecified Tanks	1938
135AJ	403	N	Unspecified Tank	1974
136AJ	403	N	Unspecified Tank	1966
137	423	N	Folding Boat Manufactory	1935
138	436	E	Unspecified Commercial/Industrial	1974
139AK	451	N	Unspecified Ground Workings	1948
140AK	451	N	Unspecified Ground Workings	1948
141AL	451	NE	Railway Sidings	1974
142AL	451	NE	Railway Sidings	1961
143AL	451	NE	Railway Sidings	1966
144AL	451	NE	Coal Yard	1966
145AM	460	NE	Railway Sidings	1948
146AM	460	NE	Railway Sidings	1948

147AN	462	NE	Goods Station	1966
148AN	462	NE	Railway Building	1974
149AN	462	NE	Railway Buildings	1935
150AO	464	NE	Unspecified Works	1966
151AO	464	NE	Unspecified Works	1974
152AN	471	NE	Railway Building	1948
153AN	471	NE	Railway Building	1948
154AN	471	NE	Railway Building	1938
155AN	472	NE	Railway Building	1961
156AP	490	NE	Unspecified Depot	1966
157AP	490	NE	Unspecified Depot	1974
158	493	NE	Unspecified Works	1987
159AQ	494	S	Telephone Exchange	1974
160AQ	494	S	Telephone Exchange	1987
161AQ	494	S	Telephone Exchange	1966

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary:

31

ID	Distance (m)	Direction	Use	Date
162B	0	On Site	Unspecified Tank	1984
163B	0	On Site	Tanks	1984
164AR	93	NE	Unspecified Tank	1995
165AR	93	NE	Unspecified Tank	1992
166AR	93	NE	Unspecified Tank	1995
167AS	161	NE	Unspecified Tank	1995
168AS	161	NE	Unspecified Tank	1991
169	177	NE	Unspecified Tank	1995
170AT	247	N	Unspecified Tank	1988
171AT	248	N	Unspecified Tank	1991
172AT	248	N	Unspecified Tank	1987
173AT	248	N	Unspecified Tank	1995
174AU	304	N	Unspecified Tank	1935
175AE	371	NE	Tanks	1935
176AI	383	N	Tanks	1935
177AE	384	NE	Tanks	1935
178AI	387	N	Tanks	1960
179AI	388	N	Tanks	1960
180AI	388	N	Tanks	1960
181AJ	402	N	Tanks	1974

182AJ	402	N	Unspecified Tank	1960
183AJ	402	N	Unspecified Tank	1960
184AJ	402	N	Unspecified Tank	1960
185AJ	405	N	Unspecified Tank	1960
186AJ	405	N	Unspecified Tank	1960
187AJ	405	N	Unspecified Tank	1960
188AV	488	E	Unspecified Tank	1935
189AV	488	E	Unspecified Tank	1915
190AV	488	E	Unspecified Tank	1865
191AV	491	E	Unspecified Tank	1896
192	499	S	Unspecified Tank	1896

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary:

69

ID	Distance (m)	Direction	Use	Date
193AW	82	SW	Electricity Substation	1995
194AW	82	SW	Electricity Substation	1995
195AW	82	SW	Electricity Substation	1992
196AW	83	SW	Electricity Substation	1984
197AX	96	N	Electricity Substation	1995
198AX	96	N	Electricity Substation	1995
199AX	96	N	Electricity Substation	1992
200A	150	NE	Electricity Substation	1984
201A	151	NE	Electricity Substation	1991
202A	151	NE	Electricity Substation	1984
203A	151	NE	Electricity Substation	1991
204AY	163	SE	Electricity Substation	1991
205AY	163	SE	Electricity Substation	1991
206AZ	166	SW	Electricity Substation	1995
207AZ	166	SW	Electricity Substation	1995
208AZ	166	SW	Electricity Substation	1992
209BA	200	N	Electricity Substation	1991
210BA	200	N	Electricity Substation	1995
211BB	236	E	Electricity Substation	1991
212BB	236	E	Electricity Substation	1991
213BC	245	NE	Electricity Substation	1988
214BC	245	NE	Electricity Substation	1994
215BC	246	NE	Electricity Substation	1991
216BC	250	NE	Electricity Substation	1988

217BC	250	NE	Electricity Substation	1994
218BC	250	NE	Electricity Substation	1991
219BC	250	NE	Electricity Substation	1983
220BD	251	N	Electricity Substation	1991
221BD	252	N	Electricity Substation	1995
222BE	274	N	Electricity Substation	1991
223BE	274	N	Electricity Substation	1987
224BE	275	N	Electricity Substation	1988
225BE	276	N	Electricity Substation	1995
226BE	281	N	Electricity Substation	1988
227BE	282	N	Electricity Substation	1991
228BE	282	N	Electricity Substation	1987
229BE	282	N	Electricity Substation	1995
230BF	295	NW	Electricity Substation	1987
231BF	295	NW	Electricity Substation	1988
232Z	363	N	Electricity Substation	1991
233Z	363	N	Electricity Substation	1995
234BG	366	NE	Electricity Substation	1988
235BG	366	NE	Electricity Substation	1991
236BG	366	NE	Electricity Substation	1983
237BG	367	NE	Electricity Substation	1994
238BH	397	N	Electricity Substation	1995
239BH	401	N	Electricity Substation	1991
240BH	401	N	Electricity Substation	1987
241BH	402	N	Electricity Substation	1988
242BI	409	NE	Electricity Substation	1988
243BI	412	NE	Electricity Substation	1983
244BI	412	NE	Electricity Substation	1991
245BI	413	NE	Electricity Substation	1994
246BJ	415	S	Electricity Substation	1996
247BJ	415	S	Electricity Substation	1995
248BJ	415	S	Electricity Substation	1996
249BJ	416	S	Electricity Substation	1982
250BJ	416	S	Electricity Substation	1982
251Y	435	N	Electricity Substation	1988
252Y	436	N	Electricity Substation	1991
253Y	436	N	Electricity Substation	1987
254Y	436	N	Electricity Substation	1983
255Y	437	N	Electricity Substation	1995
256BK	446	N	Electricity Substation	1991
257BK	447	N	Electricity Substation	1995
258BL	467	E	Electricity Substation	1991
259BL	467	E	Electricity Substation	1991
260BM	475	S	Electricity Substation	1983
261BM	481	S	Electricity Substation	1991

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 6

ID	Distance (m)	Direction	Use	Date
262BN	31	SW	Garage	1960
263BN	31	SW	Garage	1960
264BN	31	SW	Garage	1960
265AW	50	SW	Garage	1935
266BO	67	NE	Motor Car Service Station	1935
267O	150	NE	Motor Car Service Station	1935

1.6 Historical military sites

Certain military installations were not noted on historic mapping for security reasons. Whilst not all military land is necessarily of concern, Groundsure has researched and digitised a number of Ordnance Factories and other military industrial features (e.g. Ordnance Depots, Munitions Testing Grounds) which may be of contaminative concern. This research was drawn from a number of different sources, and should not be regarded as a definitive or exhaustive database of potentially contaminative military installations. The boundaries of sites within this database have been estimated from the best evidence available to Groundsure at the time of compilation.

Records of historical military sites within 500m of the search boundary: 0

Database searched and no data found.

1.7 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 62

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
268BP	0	On Site	Pond	1894

269BP	0	On Site	Pond	1898
270BP	0	On Site	Pond	1865
271BP	0	On Site	Pond	1894
272BP	0	On Site	Pond	1938
273BP	0	On Site	Pond	1935
274C	0	On Site	Unspecified Ground Workings	1948
275C	0	On Site	Unspecified Ground Workings	1948
276C	0	On Site	Unspecified Heap	1938
277C	0	On Site	Unspecified Ground Workings	1935
278C	0	On Site	Unspecified Ground Workings	1935
279D	7	SE	Cuttings	1913
280D	7	SE	Cuttings	1933
281D	7	SE	Cuttings	1894
282E	8	SE	Cuttings	1974
283E	8	SE	Cuttings	1966
284E	8	SE	Cuttings	1987
285F	11	SE	Cuttings	1948
286F	11	SE	Cuttings	1948
287D	11	SE	Cuttings	1938
288D	11	SE	Cuttings	1912
289F	12	SE	Cuttings	1935
290D	12	SE	Cuttings	1961
291F	12	SE	Cuttings	1898
292F	15	SE	Cuttings	1896
293F	16	SE	Cuttings	1912
294F	17	SE	Cuttings	1894
295BQ	17	SE	Cuttings	1865
296M	148	NE	Unspecified Heap	1961
297M	150	NE	Unspecified Ground Workings	1948
298M	150	NE	Unspecified Ground Workings	1948
299M	152	NE	Unspecified Ground Workings	1935
300M	152	NE	Unspecified Ground Workings	1935
301P	159	NE	Cuttings	1894
302P	161	NE	Cuttings	1912
303Q	161	N	Unspecified Pit	1961
304P	163	NE	Cuttings	1913
305P	163	NE	Cuttings	1938
306Q	164	N	Unspecified Ground Workings	1948
307Q	164	N	Unspecified Ground Workings	1948

308R	165	N	Unspecified Ground Workings	1935
309R	165	N	Unspecified Ground Workings	1935
310P	165	NE	Cuttings	1933
311R	168	N	Unspecified Ground Workings	1938
312V	236	NE	Unspecified Ground Workings	1948
313V	236	NE	Unspecified Ground Workings	1948
314AA	316	NE	Unspecified Ground Workings	1948
315AA	316	NE	Unspecified Ground Workings	1948
316AF	378	N	Unspecified Ground Workings	1935
317AF	378	N	Unspecified Ground Workings	1935
318AF	380	N	Unspecified Ground Workings	1938
319AF	383	N	Unspecified Ground Workings	1948
320AF	383	N	Unspecified Ground Workings	1948
321	448	NE	Canal	1865
322AK	451	N	Unspecified Ground Workings	1948
323AK	451	N	Unspecified Ground Workings	1948
324	491	NE	Canal	1912
325	495	NE	Canal	1898
326	497	NE	Canal	1894
327BR	498	NE	Canal	1948
328BR	498	NE	Canal	1948
329	498	NE	Canal	1912

2. Environmental Permits, Incidents and Registers Map



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- | | | | | | |
|--|-------------------------------|--|---|--|--|
| | Site Outline | | Recorded Pollution Incident | | RAS 3 & 4 Authorisations |
| | Dangerous Substances (List 1) | | Dangerous Substances (List 2) | | Part A(1) Authorised Processes and Historic IPC Authorisations |
| | Water Industry Referrals | | Part A(2) and Part B Authorised Processes | | COMAH / NIHHS Sites |
| | Licenced Discharge Consents | | Sites Determined as Contaminated Land | | Hazardous Substance Consents and Enforcements |
| | Red List Discharge Consents | | | | |

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

2

The following Part A(1) and IPPC Authorised Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
11A	365	N	516360 177760	<p>Operator: Bskyb Ltd Installation Name: Bskyb Osterley Campus Process: COMBUSTION; WASTE DERIVED FUEL =>3MW BUT <50MW</p> <p>Permit Number: HP3331TA Original Permit Number: HP3331TA EPR Reference: - Issue Date: 14/3/2011 Effective Date: 14/3/2011 00:00:00 Last date noted as effective: 2018-03-01 Status: Superseded</p>
12A	365	N	516360 177760	<p>Operator: Bskyb Ltd Installation Name: Bskyb Osterley Campus Process: THE INCINERATION OF NON-HAZARDOUS WASTE IN AN INCINERATION OR CO-INCINERATION PLANT WITH A CAPACITY EXCEEDING 3 TONNES PER HOUR.</p> <p>Permit Number: QP3733VW Original Permit Number: HP3331TA EPR Reference: - Issue Date: 13/2/2014 Effective Date: 13/2/2014 00:00:00 Last date noted as effective: 2018-03-01 Status: Effective</p>

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

5

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
6	0	On Site	516400 177301	Address: Gillette UK, Gt West Rd, TW7 5ND Process: Other Metal Processes Status: Historical Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
7	117	SW	516200 177301	Address: Shell Syon Hill, Gt West Rd Process: Petrol Vapour Recovery Process Status: Historical Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
8	128	W	516176 177377	Address: Shell UK Ltd, 882 Great West Road, Isleworth, TW7 4DA Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
9	183	W	516126 177406	Address: Pressed Valet Dry Cleaners, 48 Syon Lane, Isleworth, TW7 5NQ Process: Dry Cleaning Status: Current Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
10B	299	NW	516043 177505	Address: Tesco, Syon Lane, Syon Lane, Isleworth, TW8 9BS Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

ID	Distance (m)	Direction	NGR	Details
Permit Type: Part B				

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

2

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
2	303	N	516400 177700	Address: OUTLET C, GREAT WEST ROAD, BRENTFOR, OUTLET C, GREAT WEST ROAD, BRENT, FORD, MIDDX Effluent Type: TRADE DISCHARGES - COOLING WATER Permit Number: CTMR.0332 Permit Version: 1 Receiving Water: - Status: REVOKED - UNSPECIFIED Issue date: 01/01/1977 Effective Date: 01-Jan-1977 Revocation Date: 10/12/1990
3	437	SE	516780 176970	Address: NEW LODGE, LION GATE, SYON PARK, BR, NEW LODGE, LION GATE, SYON PARK,, BRENTFORD, MIDDX Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: CTCU.1933 Permit Version: 1 Receiving Water: GRAVEL STRATA Status: TRANSFERRED FROM WRA 1963 Issue date: 25/01/1985 Effective Date: 25-Jan-1985 Revocation Date:

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

1

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
1B	298	NW	516043 177503	Incident Date: 31-Aug-2001 Incident Identification: 28169 Pollutant: Oils and Fuel Pollutant Description: Petrol	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

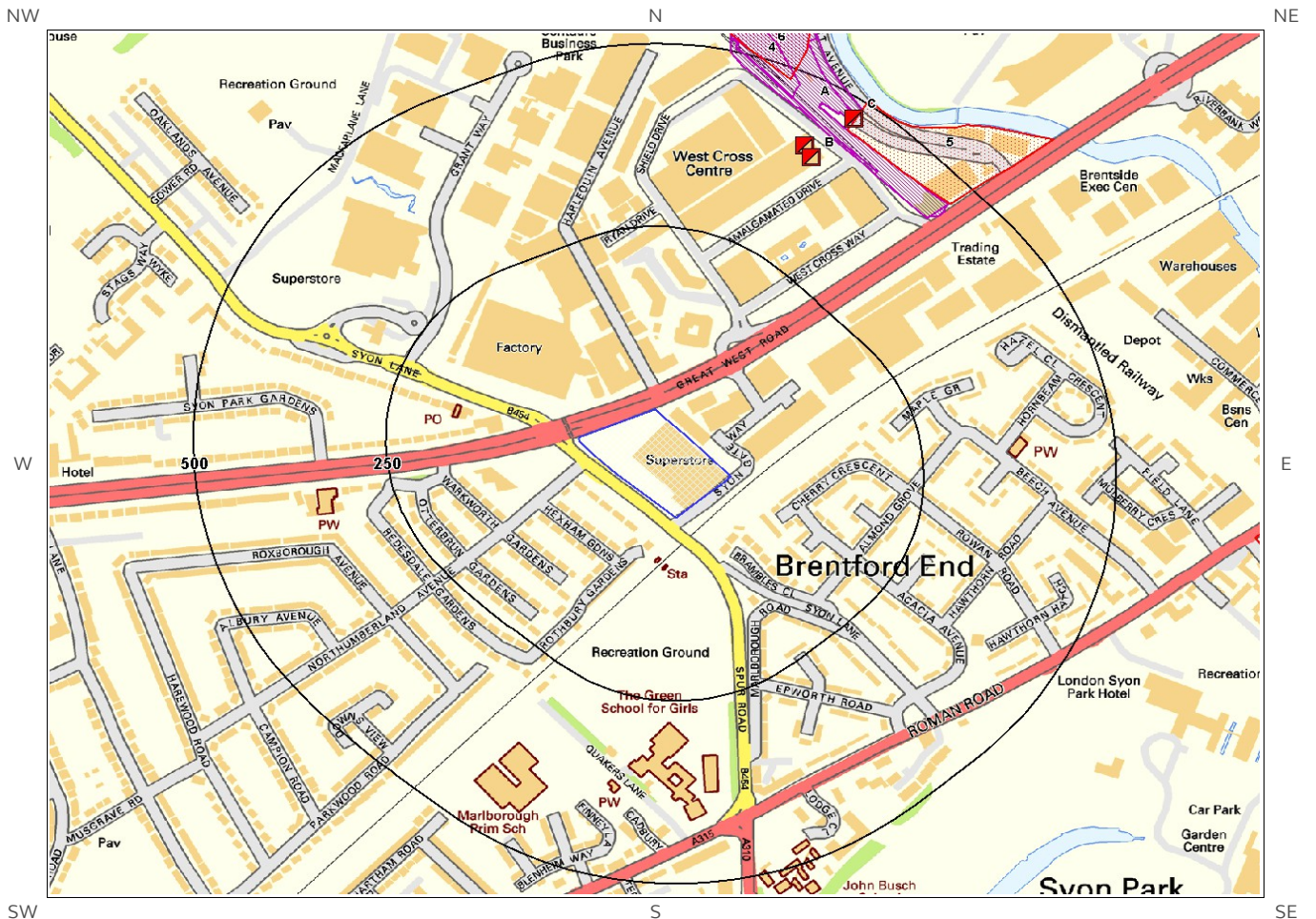
Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990










Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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- | | | | | | |
|---|------------------------|---|---------------------------|---|---|
|  | Site Outline |  | EA/NRW Active Landfill |  | Historic and Planned Waste Sites |
|  | 250 Search Buffers (m) |  | EA/NRW Historic Landfill |  | EA/NRW Licensed Waste Site |
|  | 500 Search Buffers (m) |  | BGS / DoE Survey Landfill |  | Local Authority/Historical Mapping Landfill Records |

3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

7

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
5	454	NE		Site Address: Transport Avenue, Brentford, Hounslow, London Waste Licence: - Site Reference: 8HO084, WES002 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: 31-Dec-1961
6	484	N		Site Address: Transport Avenue, Transfer Avenue Waste Licence: - Site Reference: 8HO060, HOUX13 Waste Type: Commercial, Household Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: 31-Dec-1900 Last Recorded: 31-Dec-1938
7	685	E		Site Address: Northumberland Wharf, Brentford End, Brentford, London Waste Licence: - Site Reference: 8HO067 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
Not shown	858	W		Site Address: Jersey Gardens, Osterley, Hounslow, London Waste Licence: - Site Reference: 8HO034 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: L B Hounslow First Recorded: 31-Dec-1895 Last Recorded: 31-Dec-1951
Not shown	1081	N		Site Address: Wyke Green, Brentford, Hounslow, London Waste Licence: - Licence Issue: Licence Surrendered: Licence Holder Address: -

ID	Distance (m)	Direction	NGR	Details	
				Site Reference: 8HO089 Waste Type: - Environmental Permitting Regulations (Waste) Reference: -	Operator: - Licence Holder: - First Recorded: 31-Dec-1949 Last Recorded: -
Not shown	1256	NE		Site Address: Layton Road, Brentford, Hounslow, London Waste Licence: - Site Reference: 8HO083 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: 31-Dec-1865
Not shown	1491	SW		Site Address: London Road Sports Ground, London Road Waste Licence: - Site Reference: 8HO035, HOU036 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: Greenhams sand and Gravel Licence Holder: - First Recorded: 31-Dec-1934 Last Recorded: 31-Dec-1951

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

1

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Site Address	Source	Data Type
Not shown	1487	SW	515057 176049	Thornbury Park	London Borough of Hounslow	Polygon

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

4

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details		
1A	429	NE	516598 177829	Type of Site: Refuse Transfer	Planning Application Reference: N/A	Further Details: N/A Data Source: Historic Mapping

ID	Distance (m)	Direction	NGR	Details		
				Station Site Address: N/A	Date: 1991	Data Type: Polygon
2A	429	NE	516598 177829	Type of Site: Refuse Transfer Station Site Address: N/A	Planning Application Reference: N/A Date: 1983	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon
3A	429	NE	516640 177829	Type of Site: Refuse Transfer Station Site Address: N/A	Planning Application Reference: N/A Date: 1994	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon
4	461	NE	516544 177896	Type of Site: Refuse Transfer Station Site Address: N/A	Planning Application Reference: N/A Date: 1988	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

12

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details		
12B	400	NE	516604 177743	Site Address: Unit 8, Amalgamated Drive, West Cross Ind Park, Brentford, Middlesex, TW8 9EZ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: REN041 EPR reference: EA/EPR/DB3800XR/T001 Operator: Rentokil Initial U K Limited Waste Management licence No: 100044 Annual Tonnage: 4999.0	Issue Date: 09/09/2007 Effective Date: 01/02/2016 Modified: 15/08/2014 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Brentford Service Centre Correspondence Address: -	
13B	400	NE	516604 177743	Site Address: Initial Washrooms (Brentford) Service Centre, Unit 8, Amalgamated Drive, West Cross Ind Park, Brentford, Middlesex, TW8 9EZ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: REN041 EPR reference: EA/EPR/DB3800XR/V003 Operator: Rentokil Initial U K Ltd Waste Management licence No: 100044 Annual Tonnage: 4999.0	Issue Date: 09/09/2007 Effective Date: 01/02/2016 Modified: 08/06/2018 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Initial Washrooms (Brentford) Service Centre Correspondence Address: -	
14B	409	NE	516595 177758	Site Address: Unit 8, Amalgamated Drive, West Cross Ind Park, Brentford, Middlesex, TW8 9EZ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes	Issue Date: 09/09/2007 Effective Date: - Modified: 15/08/2014 Surrendered Date: - Expiry Date: - Cancelled Date: -	

ID	Distance (m)	Direction	NGR	Details
				<p>Environmental Permitting Regulations (Waste) Licence Number: REN005 EPR reference: EA/EPR/FP3395EE/V003 Operator: Rentokil Initial Services Limited Waste Management licence No: 100044 Annual Tonnage: 4999.0</p> <p>Status: Modified Site Name: Brentford Service Centre Correspondence Address: -</p>
15B	409	NE	516595 177758	<p>Site Address: Unit 8, Amalgamated Drive, West Cross Ind Park, Brentford, Middlesex, TW8 9EZ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: REN005 EPR reference: EA/EPR/FP3395EE/V002 Operator: Rentokil Initial Services Ltd Waste Management licence No: 100044 Annual Tonnage: 4999.0</p> <p>Issue Date: 09/09/2007 Effective Date: - Modified: 31/03/2010 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Brentford Service Centre Correspondence Address: -</p>
16C	473	NE	516659 177795	<p>Site Address: Transport Avenue Transfer Station, Transport Avenue, Off Great West Road, Brentford, Middlesex, TW8 9HF Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WES002 EPR reference: EA/EPR/RP3496NV/A001 Operator: West London Waste Authority Waste Management licence No: 80077 Annual Tonnage: 552975.0</p> <p>Issue Date: 20/04/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Transport Avenue Transfer Station Correspondence Address: -</p>
17C	473	NE	516659 177795	<p>Site Address: Transport Avenue Transfer Station, Transport Avenue, Off Great West Road, Brentford, Middlesex, TW8 9HF Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SIT773 EPR reference: EA/EPR/AB3709CF/V002 Operator: Sita U K Ltd Waste Management licence No: 80077 Annual Tonnage: 432840.0</p> <p>Issue Date: 20/04/1993 Effective Date: 19/01/2014 Modified: 25/11/2014 Surrendered Date: 0 Expiry Date: - Cancelled Date: - Status: Modified Site Name: Transport Avenue Transfer Station Correspondence Address: -</p>
Not shown	621	N	516454 178016	<p>Site Address: Transport Avenue Transfer Station, Transport Avenue, Off Great West Road, Brentford, Middlesex, TW8 9HF Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SIT773 EPR reference: EA/EPR/AB3709CF/V003 Operator: Suez Recycling And Recovery U K Ltd Waste Management licence No: 80077 Annual Tonnage: 432840.0</p> <p>Issue Date: 20/04/1993 Effective Date: 19/01/2014 Modified: 30/06/2016 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Transport Avenue Transfer Station Correspondence Address: -</p>
Not shown	705	N	516496 178096	<p>Site Address: Transport Avenue, Brentford, Middlesex, TW8 9HF Type: Mobile plant treatment for soil <75,000 tpd Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: DAY057 EPR reference: EA/EPR/DB3639DV/A001 Operator: Day Group Limited Waste Management licence No: 105269 Annual Tonnage: 74999.0</p> <p>Issue Date: 16/12/2011 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: S R 2010 No 11 Correspondence Address: -</p>

ID	Distance (m)	Direction	NGR	Details
Not shown	747	N	516323 178140	<p>Site Address: Mayer Parry Brentford, Private Sidings, Transport Avenue, Brentford, Middlesex, TW8 9HA Type: Metal Recycling Site (mixed MRS's) Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MAY003 EPR reference: EA/EPR/YP3091NU/V002 Operator: Mayer Parry Recycling Ltd Waste Management licence No: 80370 Annual Tonnage: 74999.0</p> <p>Issue Date: 28/07/1998 Effective Date: - Modified: 11/12/2009 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Mayer Parry, Brentford Correspondence Address: -</p>
Not shown	760	N	516490 178152	<p>Site Address: Brentford Aggregate Materials Recycling Facility, Transport Avenue, Brentford, Middlesex, TW8 9HF Type: Material Recycling Treatment Facility Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: DAY051 EPR reference: EA/EPR/BB3232RX/A001 Operator: Day Group Ltd Waste Management licence No: 103193 Annual Tonnage: 775000.0</p> <p>Issue Date: 31/05/2012 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Brentford Aggregate Materials Recycling Facility Correspondence Address: -</p>
Not shown	809	N	516300 178200	<p>Site Address: Mayer Parry Brentford, Private Sidings, Transport Avenue, Brentford, Middx, TW8 9HA Type: Metal Recycling Site (mixed MRS's) Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MAY003 EPR reference: - Operator: Mayer Parry Recycling Ltd Waste Management licence No: 80370 Annual Tonnage: 0.0</p> <p>Issue Date: 28/07/1998 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: "Mayer Parry, Brentford" Correspondence Address: Mayer Parry Recycling Ltd, Manor Road, Erith, Kent, DA8 2AD</p>
Not shown	823	N	516294 178213	<p>Site Address: Brentford Aggregate Materials Recycling Facility, Transport Avenue, Brentford, Middlesex, TW8 9HF Type: Material Recycling Treatment Facility Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: DAY051 EPR reference: EA/EPR/BB3232RX/V004 Operator: Day Group Limited Waste Management licence No: 103193 Annual Tonnage: 500000.0</p> <p>Issue Date: 31/05/2012 Effective Date: - Modified: 15/03/2018 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Brentford Aggregate Materials Recycling Facility Correspondence Address: -</p>

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

27

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1A	14	NE	Lookers West London Skoda	516430 177390	931, Great West Road, Brentford, TW8 9DU	New Vehicles	Motoring
2A	14	NE	West London Skoda	516430 177390	931, Great West Road, Brentford, TW8 9DU	Vehicle Repair, Testing and Servicing	Repair and Servicing
3	48	NE	BMI Syon Clinic	516461 177407	941, Great West Road, Brentford, TW8 9DU	Hospitals	Health Practitioners and Establishments
4	58	N	Factory	516355 177442	TW8	Unspecified Works Or Factories	Industrial Features
5	69	S	Syon Lane Rail Station	516412 177182	TW7	Railway Stations, Junctions and Halts	Public Transport, Stations and Infrastructure
6	100	N	Electricity Sub Station	516396 177497	TW8	Electrical Features	Infrastructure and Facilities
7B	115	N	Works	516371 177508	TW8	Unspecified Works Or Factories	Industrial Features
8	127	SW	Works	516188 177302	TW7	Unspecified Works Or Factories	Industrial Features
9B	132	N	Works	516361 177523	TW8	Unspecified Works Or Factories	Industrial Features
10C	132	W	Shell Service Station	516171 177374	882, Great West Road, Isleworth, TW7 5NG	Petrol and Fuel Stations	Road and Rail
11C	133	W	Shell Gillette Corner	516170 177377	882, Great West Road, Isleworth, TW7 5NG	Petrol and Fuel Stations	Road and Rail
12	138	NW	Factory	516232 177477	TW7	Unspecified Works Or Factories	Industrial Features
13	145	NE	Big Yellow Self Storage Company Ltd	516554 177454	961, Great West Road, Brentford, TW8 9FX	Container and Storage	Transport, Storage and Delivery
14	148	SE	Electricity Sub Station	516528 177138	TW7	Electrical Features	Infrastructure and Facilities
15	149	NE	Electricity Sub Station	516580 177434	TW8	Electrical Features	Infrastructure and Facilities
16	149	NE	Mit Skills Centre	516605 177410	9, Syon Gate Way, Brentford, TW8 9DD	Vehicle Repair, Testing and Servicing	Repair and Servicing
17	165	SE	Electricity Sub Station	516630 177205	TW8	Electrical Features	Infrastructure and Facilities
18	170	SW	Man Power Rubbish Clearance	516230 177189	39, Warkworth Gardens, Isleworth, TW7 5JP	Waste Storage, Processing and Disposal	Infrastructure and Facilities
19	171	SW	Electricity	516312	TW7	Electrical Features	Infrastructure and

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
			Sub Station	177123			Facilities
20	175	W	Airzak Building Services	516133 177403	46, Syon Lane, Isleworth, TW7 5NQ	Construction Completion Services	Construction Services
21	180	N	Factory	516345 177568	TW8	Unspecified Works Or Factories	Industrial Features
22	202	N	Electricity Sub Station	516353 177594	TW8	Electrical Features	Infrastructure and Facilities
23	208	N	Works	516281 177574	TW8	Unspecified Works Or Factories	Industrial Features
24	227	E	Electricity Sub Station	516725 177329	TW8	Electrical Features	Infrastructure and Facilities
25D	246	N	Electricity Sub Station	516336 177634	TW8	Electrical Features	Infrastructure and Facilities
26	247	N	Electricity Sub Station	516424 177643	TW8	Electrical Features	Infrastructure and Facilities
27D	247	N	Factory	516314 177628	TW8	Unspecified Works Or Factories	Industrial Features

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

3

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
28	16	SW	516296 177338	TEXACO	Great West Road, Syon Lane, Brentford, Outer London, TW7 5NU	Not Applicable	Obsolete
29	95	W	516209 177375	SHELL	882, Great West Road, Syon Lane, Brentford, Outer London, TW7 5NG	No	Open
30	278	NW	516055 177484	TESCO EXTRA	Syon Lane, Osterley Park, Isleworth, Outer London, TW7 5NZ	No	Open

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
TPGR-XSV	TAPLOW GRAVEL MEMBER	SAND AND GRAVEL

5.3 Bedrock and Solid Geology

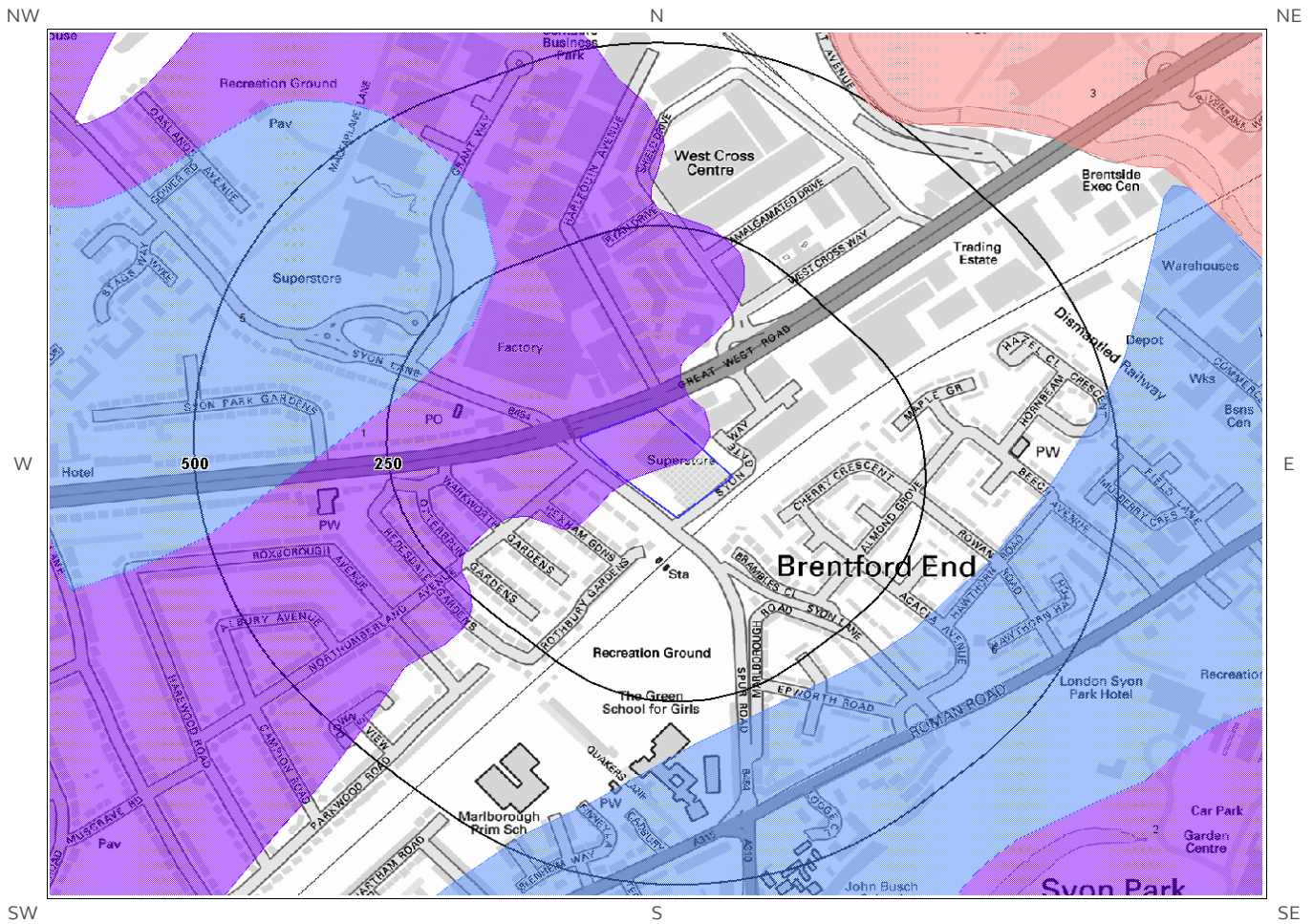
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
LC-XCZ	LONDON CLAY FORMATION	CLAY AND SILT

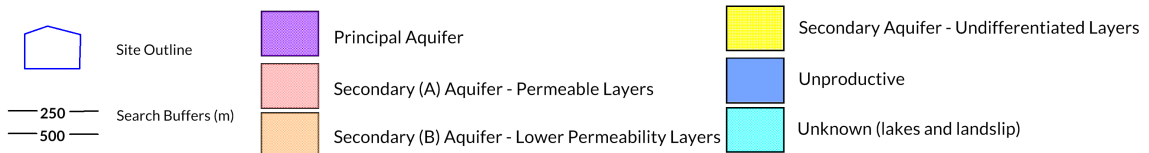
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

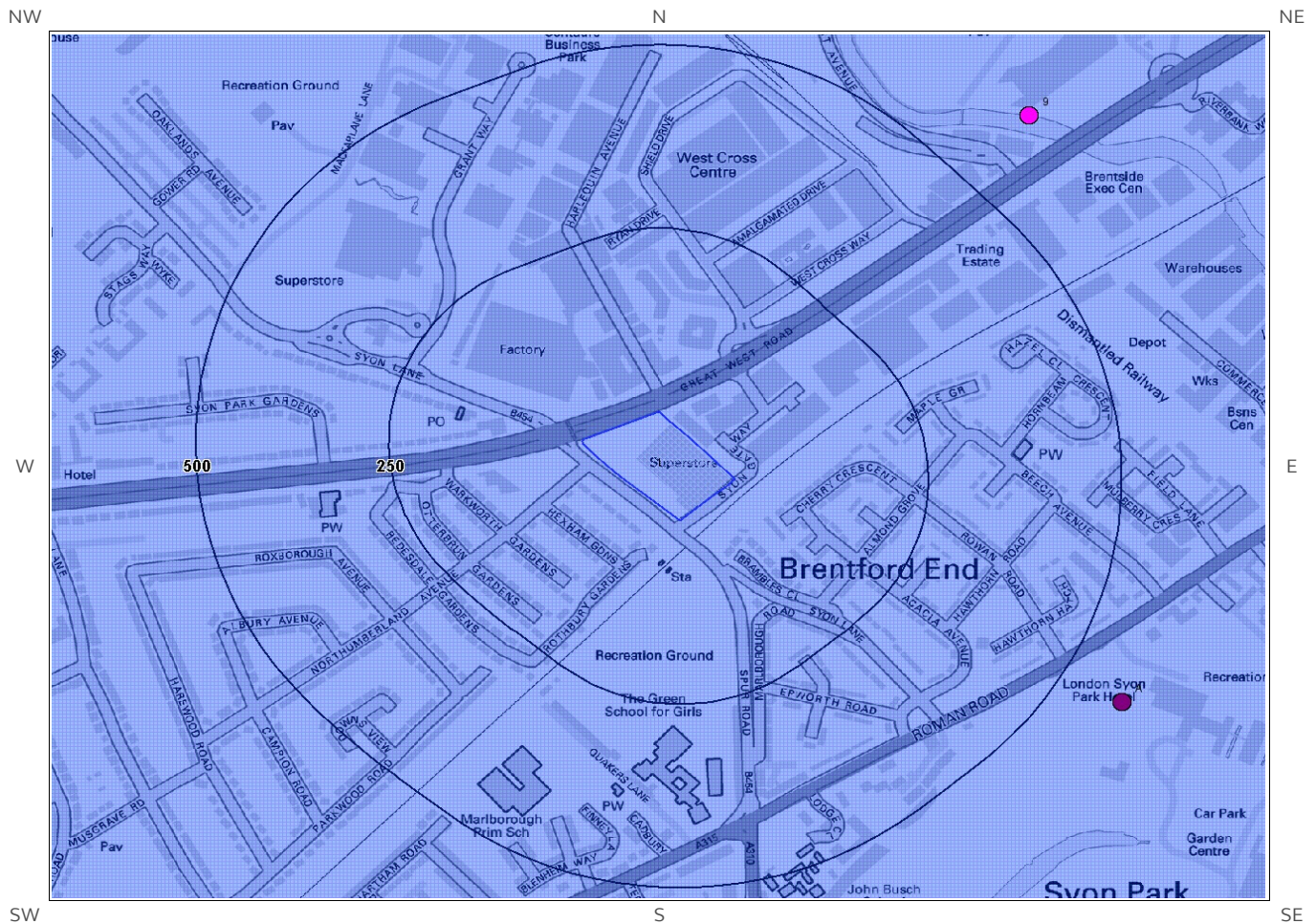
6a. Aquifer Within Superficial Geology



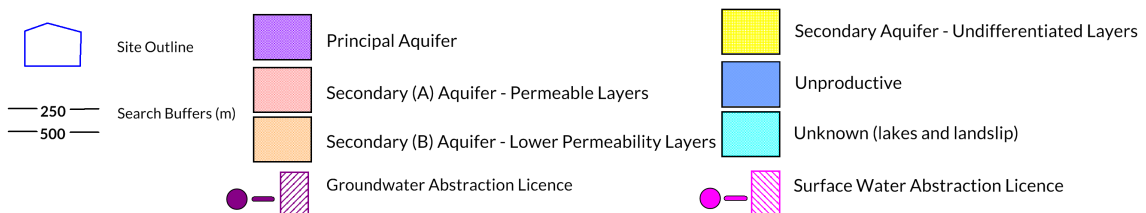
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6b. Aquifer Within Bedrock Geology and Abstraction Licences

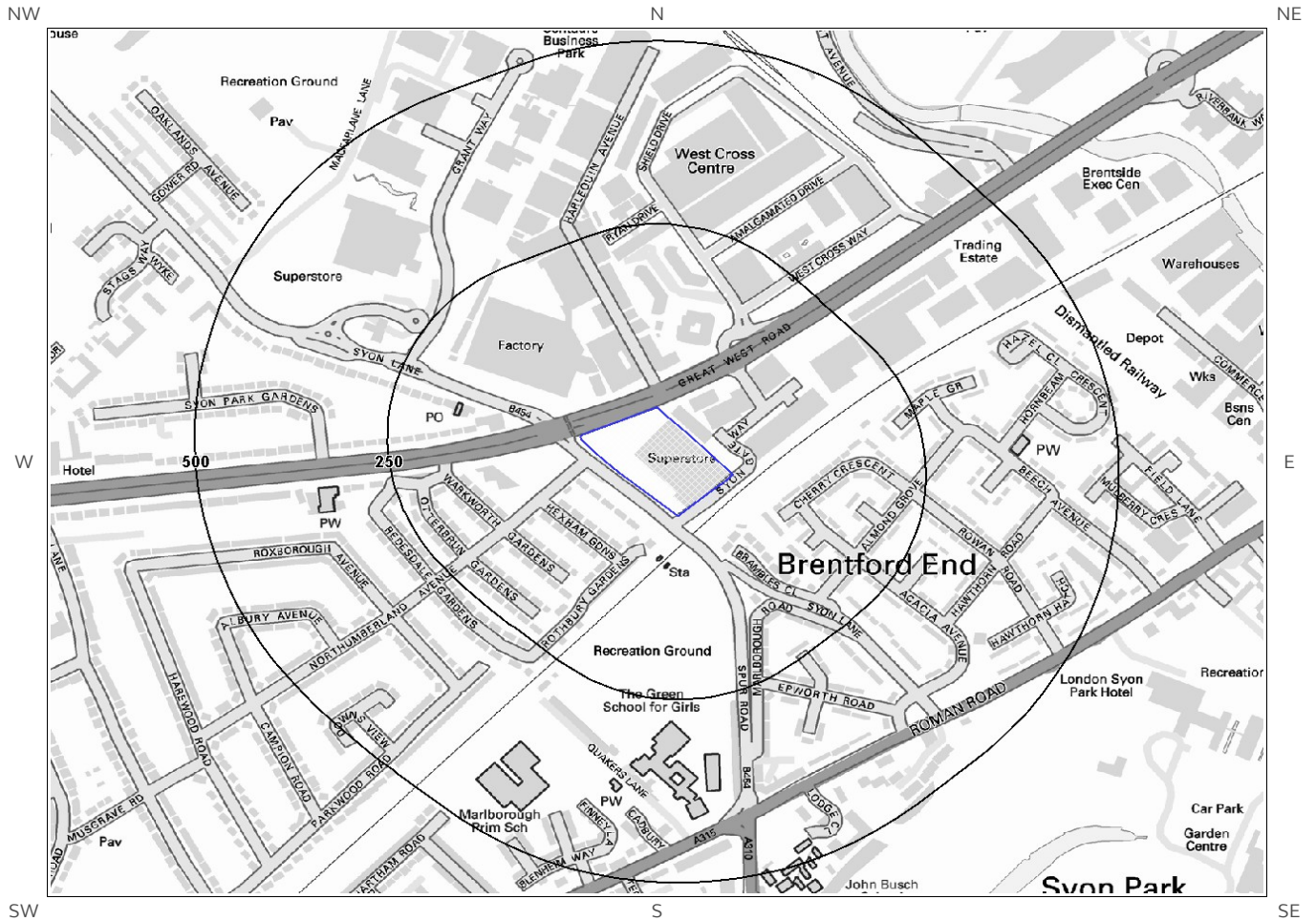


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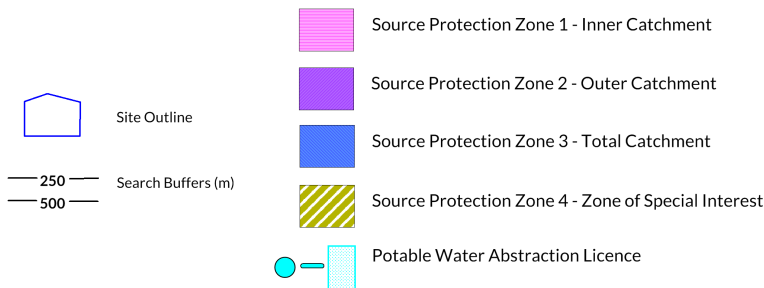




6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences

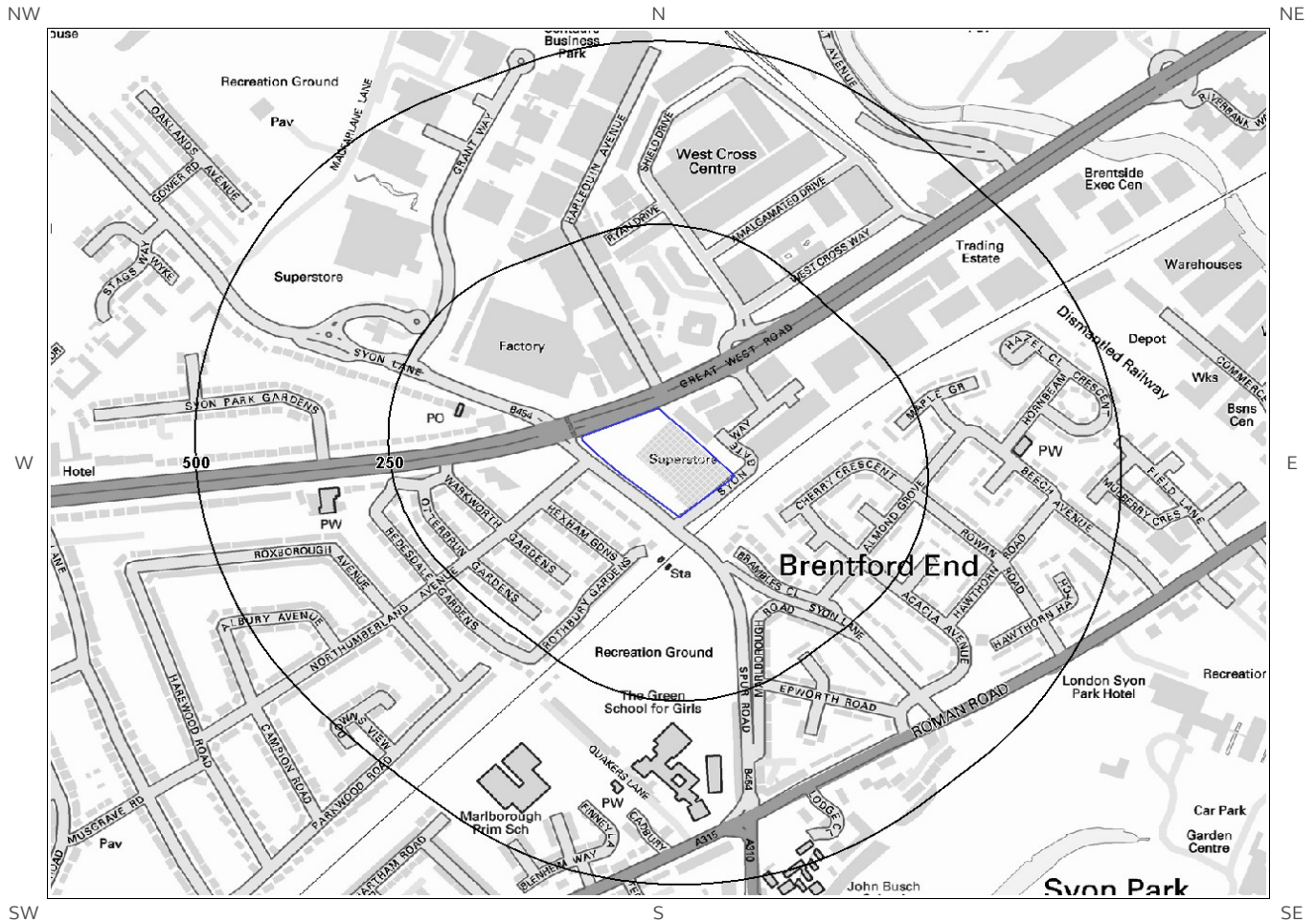


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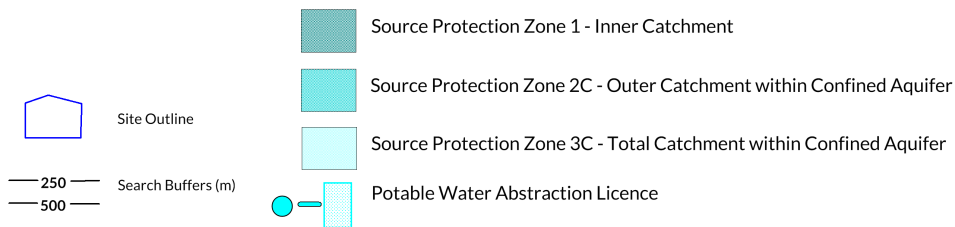




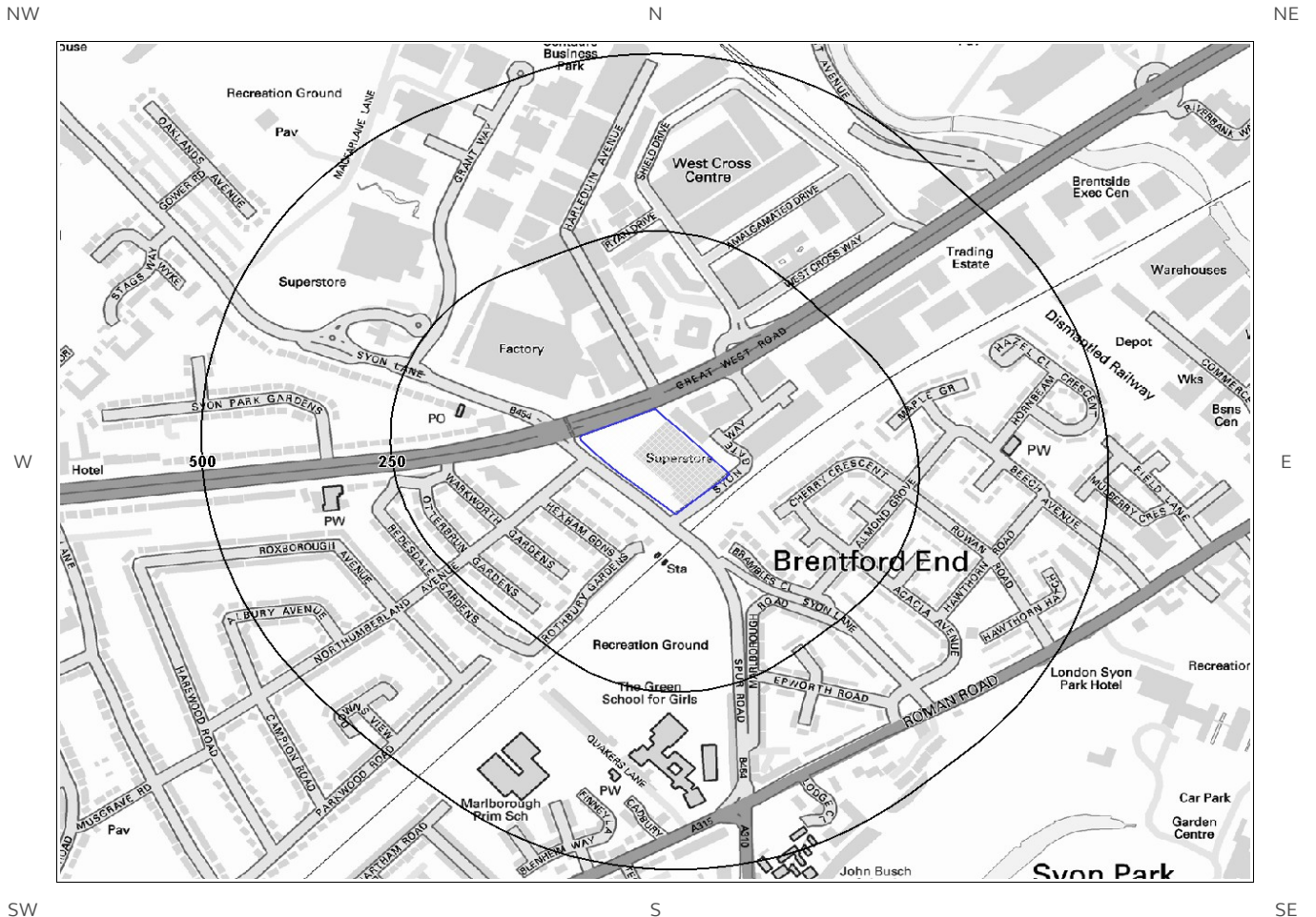
6d. Hydrogeology – Source Protection Zones within confined aquifer



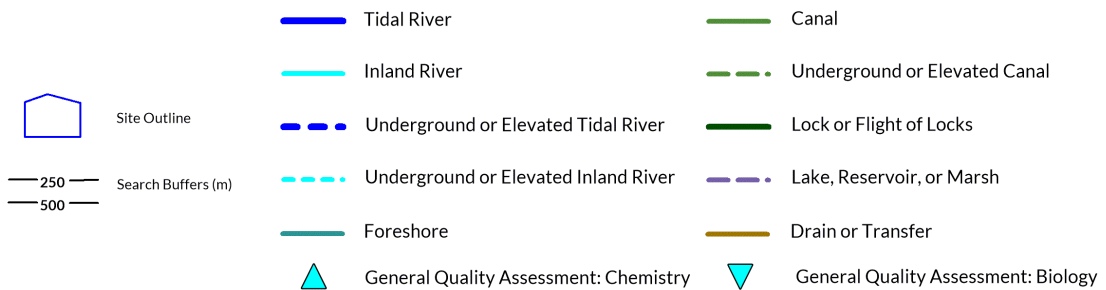
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6e. Hydrology – Watercourse Network and River Quality



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6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
5	206	NW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
6	285	SE	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
3	497	NE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site

Identified

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
2A	586	SE	517000 177000	Status: Active Licence No: 28/39/37/0005 Details: Horticultural Watering Direct Source: THAMES GROUNDWATER Point: BOREHOLE 'A' AT SYON PARK, BRENTFORD Data Type: Point Name: Trustees Of Syon Park Estate Annual Volume (m ³): 9092 Max Daily Volume (m ³): 218.2 Original Application No: - Original Start Date: 29/07/1982 Expiry Date: - Issue No: 102 Version Start Date: 28/09/2010 Version End Date:
3A	586	SE	517000 177000	Status: Active Licence No: 28/39/37/0005 Details: Spray Irrigation - Direct Direct Source: THAMES GROUNDWATER Point: BOREHOLE 'A' AT SYON PARK, BRENTFORD Data Type: Point Name: Trustees Of Syon Park Estate Annual Volume (m ³): 9092 Max Daily Volume (m ³): 218.2 Original Application No: - Original Start Date: 29/07/1982 Expiry Date: - Issue No: 102 Version Start Date: 28/09/2010 Version End Date:
Not shown	853	SE	517100 176700	Status: Active Licence No: 28/39/37/0005 Details: Horticultural Watering Direct Source: THAMES GROUNDWATER Point: BOREHOLE 'B' AT SYON PARK, BRENTFORD Data Type: Point Name: Trustees Of Syon Park Estate Annual Volume (m ³): 9092 Max Daily Volume (m ³): 218.2 Original Application No: - Original Start Date: 29/07/1982 Expiry Date: - Issue No: 102 Version Start Date: 28/09/2010 Version End Date:
Not shown	853	SE	517100 176700	Status: Active Licence No: 28/39/37/0005 Details: Spray Irrigation - Direct Direct Source: THAMES GROUNDWATER Point: BOREHOLE 'B' AT SYON PARK, BRENTFORD Data Type: Point Name: Trustees Of Syon Park Estate Annual Volume (m ³): 9092 Max Daily Volume (m ³): 218.2 Original Application No: - Original Start Date: 29/07/1982 Expiry Date: - Issue No: 102 Version Start Date: 28/09/2010 Version End Date:
Not shown	1819	SE	517460 175750	Status: Active Licence No: 28/39/35/0006 Details: Spray Irrigation - Direct Direct Source: THAMES GROUNDWATER Point: BOREHOLE A GRAVEL AT ROYAL MID SURREY GOLF CLUB, RICHMOND Data Type: Point Name: ROYAL MID SURREY GOLF CLUB Annual Volume (m ³): 43000 Max Daily Volume (m ³): 480 Original Application No: - Original Start Date: 28/03/1996 Expiry Date: - Issue No: 100 Version Start Date: 28/03/1996 Version End Date:
Not shown	1819	SE	517460 175750	Status: Historical Licence No: 28/39/35/0006 Details: Spray Irrigation - Direct Direct Source: THAMES GROUNDWATER Point: GRAVEL AT ROYAL MID SURREY GOLF CLUB, RICHMOND Data Type: Line Name: ROYAL MID SURREY GOLF CLUB Annual Volume (m ³): 43000 Max Daily Volume (m ³): 480 Original Application No: - Original Start Date: 28/03/1996 Expiry Date: - Issue No: 100 Version Start Date: 28/03/1996 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1855	SE	517450 175700	Status: Active Licence No: 28/39/35/0006 Details: Spray Irrigation - Direct Direct Source: THAMES GROUNDWATER Point: BOREHOLE B GRAVEL AT ROYAL MID SURREY GOLF CLUB, RICHMOND Data Type: Point Name: ROYAL MID SURREY GOLF CLUB	Annual Volume (m ³): 43000 Max Daily Volume (m ³): 480 Original Application No: - Original Start Date: 28/03/1996 Expiry Date: - Issue No: 100 Version Start Date: 28/03/1996 Version End Date:

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site

Identified

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
9	621	NE	516880 177800	Status: Active Licence No: 28/39/36/0074 Details: Non-Evaporative Cooling Direct Source: THAMES SURFACE WATER - NON TIDAL Point: 980 GREAT WESTERN ROAD, BRENTFORD- RIVER BRENT Data Type: Point Name: Canal and River Trust	Annual Volume (m ³): 876000 Max Daily Volume (m ³): 2400 Application No: - Original Start Date: 03/09/2007 Expiry Date: 31/03/2025 Issue No: 2 Version Start Date: 17/12/2007 Version End Date:
Not shown	920	N	516180 178290	Status: Historical Licence No: 28/39/38/0039 Details: Dust Suppression Direct Source: THAMES SURFACE WATER - NON TIDAL Point: GRAND UNION CANAL AT BRENTFORD, MIDDLESEX Data Type: Point Name: BRITISH WATERWAYS BOARD	Annual Volume (m ³): 20000 Max Daily Volume (m ³): 100 Application No: - Original Start Date: 21/04/1999 Expiry Date: 31/12/2009 Issue No: 101 Version Start Date: 17/12/2007 Version End Date:
Not shown	920	N	516180 178290	Status: Active Licence No: TH/039/0038/004 Details: Dust Suppression Direct Source: THAMES SURFACE WATER - NON TIDAL Point: GRAND UNION CANAL AT BRENTFORD, MIDDLESEX Data Type: Point Name: Canal and River Trust	Annual Volume (m ³): 20000 Max Daily Volume (m ³): 100 Application No: - Original Start Date: 25/05/2010 Expiry Date: 31/03/2019 Issue No: 1 Version Start Date: 25/05/2010 Version End Date:

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site

None identified

Database searched and no data found.

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site

None identified

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site

None identified

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site

Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site

Identified

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
Not shown	984	N	516120 178340	River Name: Grand Union Canal (brent) Reach: Wyke Stream - Tideway End/Start of Stretch: Start of Stretch NGR	D	D	E	E	E
Not shown	984	N	516120 178340	River Name: Brent Reach: Costons Brook - Wyke Stream End/Start of Stretch: End of Stretch NGR	E	E	E	E	E

6.9.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAH). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Chemical Quality Grade				
					2005	2006	2007	2008	2009
Not shown	798	E	517297 177321	River Name: Brent Reach: Wyke Stream - Tideway End/Start of Stretch: Sample Point NGR	C	C	C	D	D
Not shown	984	N	516120 178340	River Name: Brent Reach: Wyke Stream - Tideway End/Start of Stretch: Start of Stretch NGR	C	C	C	D	D

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

Database searched and no data found.

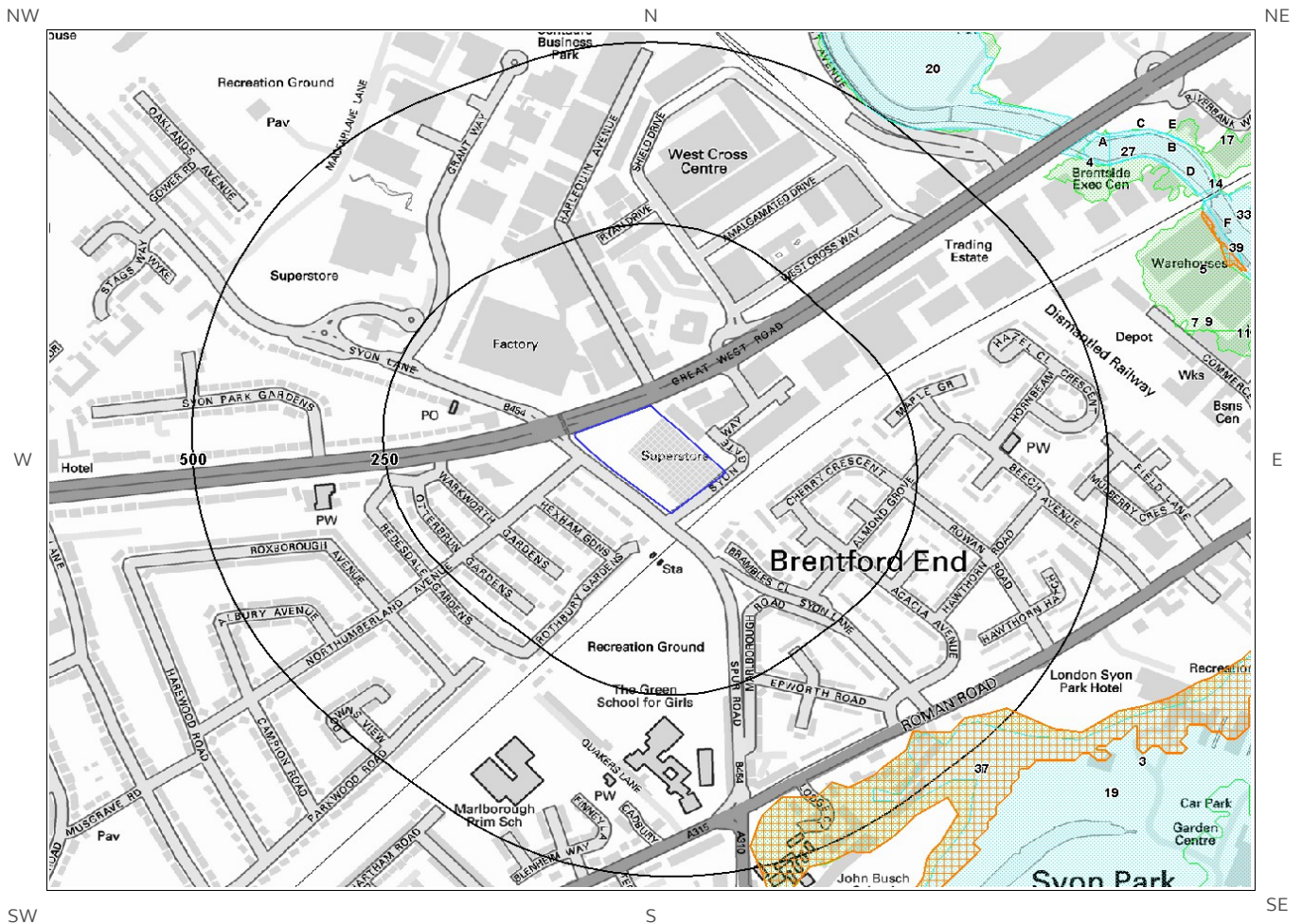
6.11 Surface Water Features

Surface water features within 250m of the study site

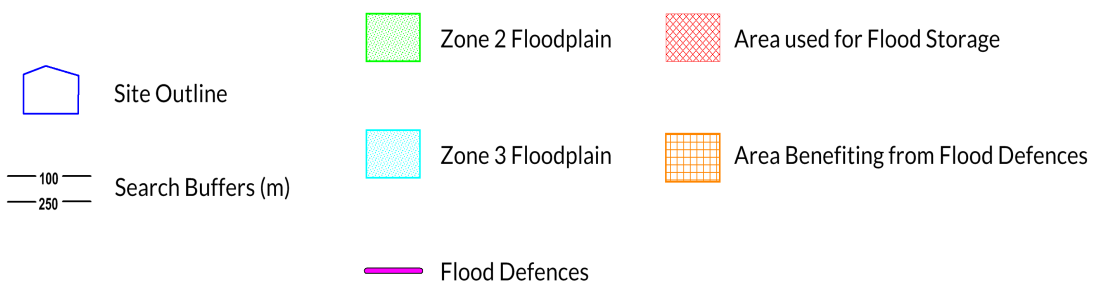
None identified

Database searched and no data found.

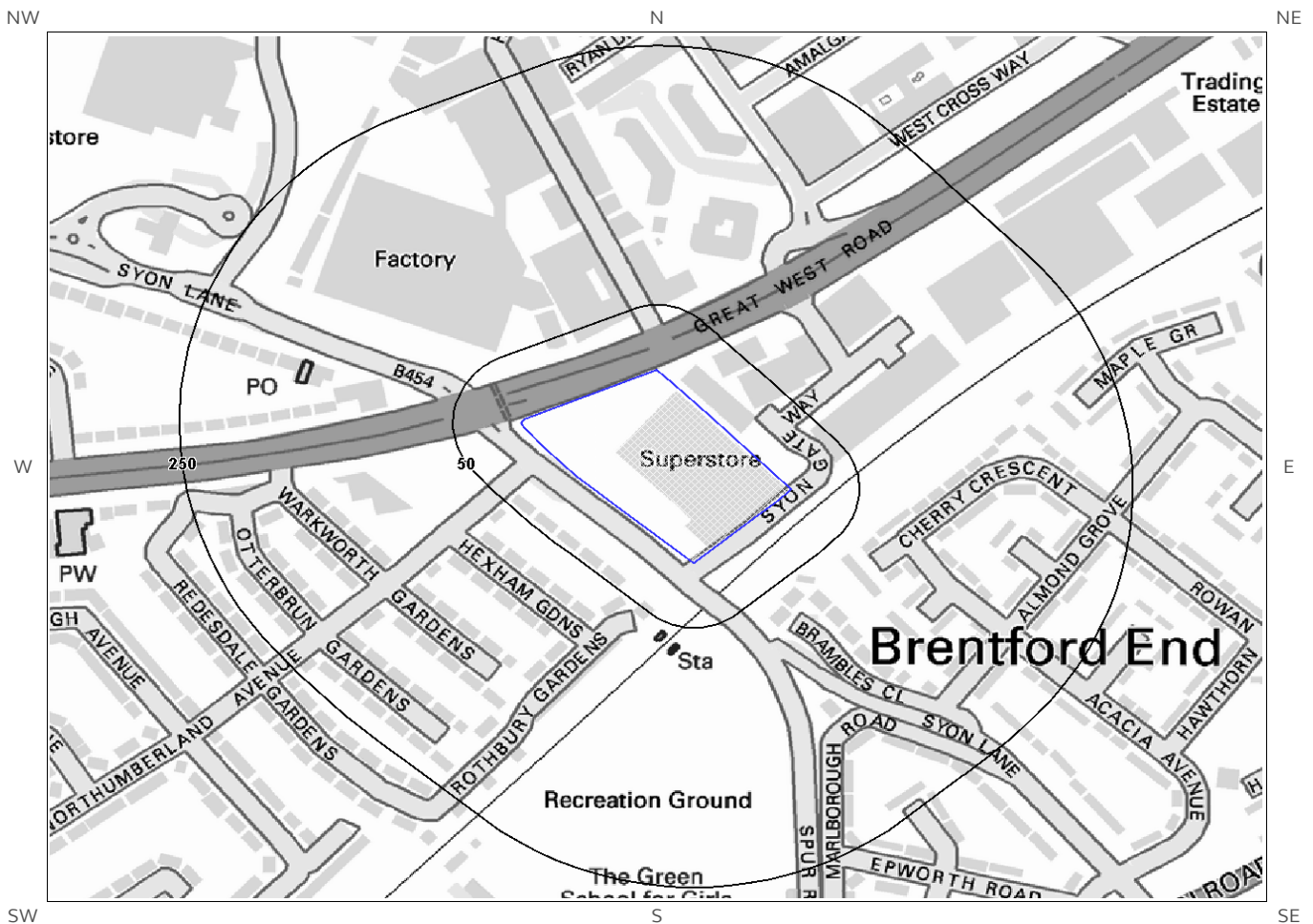
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



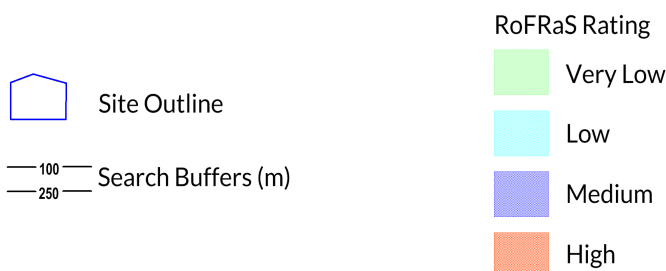
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7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m None identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m None identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite Very Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Flood Defences within 250m of the study site None identified
Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Areas benefiting from Flood Defences within 250m of the study site None identified

7.6 Areas benefiting from Flood Storage

Areas used for Flood Storage within 250m of the study site

None identified

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site

Identified

Clearwater Flooding or Superficial Deposits Flooding

Superficial Deposits Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions

Potential below Surface

Where potential for groundwater flooding of property situated below ground level is indicated, this means that given the geological conditions there may be a groundwater flooding hazard to basements and other below surface infrastructure. Unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area you need take no further action in relation to groundwater flooding hazard. If there are records of previous incidences of groundwater flooding, then is recommended that other information e.g. rainfall history, property type, and land drainage information in addition to previous records of flooding be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

7.8 Groundwater Flooding Confidence Areas

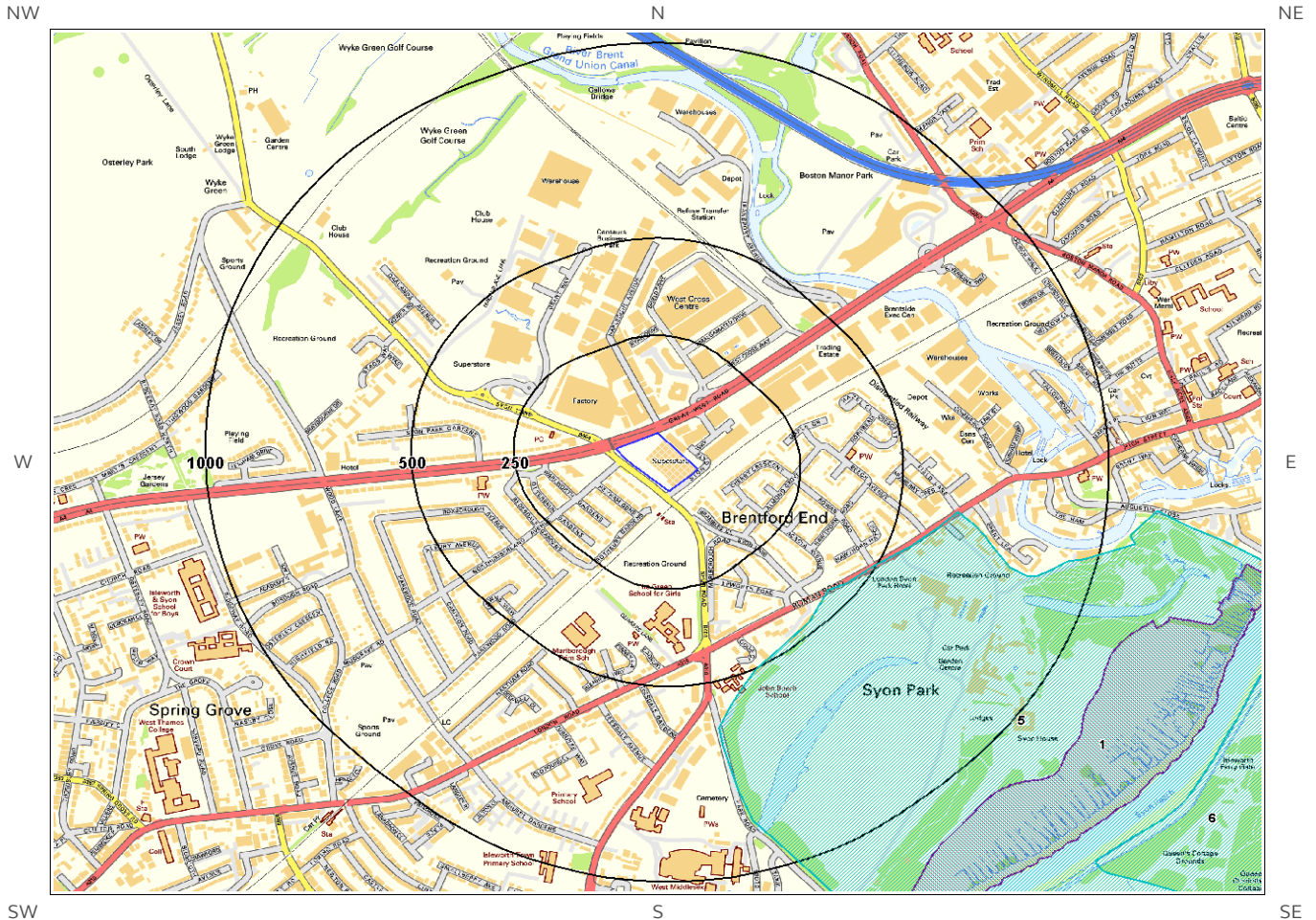
British Geological Survey confidence rating in this result

High

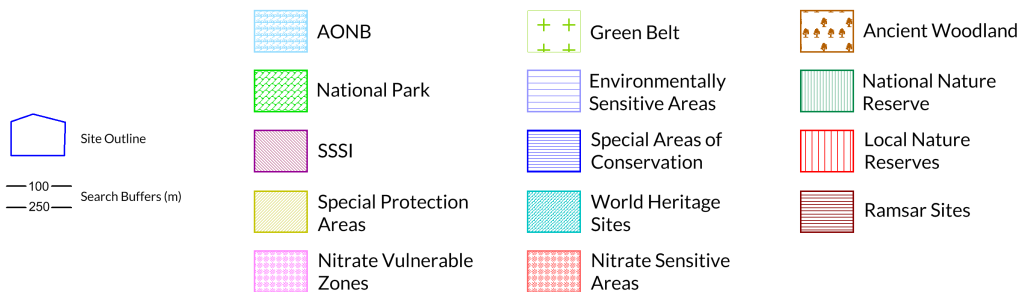
Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site

Identified

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

1

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SSSI Name	Data Source
1	1100	SE	Syon Park	Natural England

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

0

Database searched and no data found.

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

3

The following Local Nature Reserve (LNR) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
Not shown	1253	N	Blondin Nature area	Natural England
Not shown	1328	S	Isleworth Ait	Natural England
Not shown	1680	NW	Long Wood	Natural England

8.8 Records of World Heritage Sites within 2000m of the study site:

2

The following World Heritage Site records provided by English Heritage and Cadw are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	World Heritage Site Name	Data Source
5	444	SE	Royal Botanic Gardens, Kew Buffer Zone	Historic England
6	1394	SE	Royal Botanic Gardens, Kew	Historic England

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

0

Database searched and no data found.

8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a **Groundsure Geo Insight**, available from our [website](#). The following information has been found:

9.1.1 Shrink Swell

Maximum Shrink-Swell** hazard rating identified on the study site Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site

Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

Maximum Running Sand** hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

* This indicates an automatically generated 50m buffer and site.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site

None identified

Database searched and no data found.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary

None identified

Database searched and no data found.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site

None identified

Guidance: No Guidance Required.

Contact Details

Waterman
Telephone: 0207 9287888
info@groundsure.com



British Geological Survey Enquiries

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Email:

Web: www.bgs.ac.uk

BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk



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The Coal
Authority

Ordnance Survey

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Tel: 08456 050505



Local Authority

Authority: London Borough of Hounslow
Phone: 020 8583 2000

Web: <http://www.hounslow.gov.uk/>

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Gemapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444





Groundsure

LOCATION INTELLIGENCE



Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England/Natural Resources Wales who retain the Copyright and Intellectual Property Rights for the data.

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<https://www.groundsure.com/terms-and-conditions-may25-2018>



Waterman Infrastructure & Environment
Limited

Report Reference: WTM1-5522778

PICKFORDS WHARF WATERMAN GROUP,
CLINK STREET,
LONDON, SE1 9DG

Your Reference: 93632

Report Date 11 Oct 2018

Report Delivery Method: Email - pdf

Geo Insight

Address: HOMEBASE, 67, SYON LANE, ISLEWORTH, TW7 5QE

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159 000, queries: info@groundsure.com quoting the above report reference number

Yours faithfully,

Waterman

Enc.
Groundsure Geo Insight

Address: HOMEBASE, 67, SYON LANE, ISLEWORTH, TW7 5QE
Date: 11 Oct 2018
Reference: WTM1-5522778
Client: Waterman Infrastructure & Environment Limited

NW N NE



SW S SE

Aerial Photograph Capture date: 20-Apr-2015
Grid Reference: 516415,177325
Site Size: 1.46ha

Contents Page

Contents Page.....	3
Overview of Findings.....	5
1:10,000 Scale Availability.....	8
Availability of 1:10,000 Scale Geology Mapping.....	9
1 Geology (1:10,000 scale).....	10
1.1 Artificial Ground map (1:10,000 scale).....	10
1. Geology 1:10,000 scale.....	11
1.1 Artificial Ground.....	11
1.2 Superficial Deposits and Landslips map (1:10,000 scale).....	12
1.2 Superficial Deposits and Landslips.....	13
1.2.1 Superficial Deposits/ Drift Geology.....	13
1.2.2 Landslip.....	13
1.3 Bedrock and linear features map (1:10,000 scale).....	14
1.3 Bedrock and linear features.....	15
1.3.1 Bedrock/ Solid Geology.....	15
1.3.2 Linear features.....	15
2 Geology 1:50,000 Scale.....	16
2.1 Artificial Ground map.....	16
2. Geology 1:50,000 scale.....	17
2.1 Artificial Ground.....	17
2.1.1 Artificial/ Made Ground.....	17
2.1.2 Permeability of Artificial Ground.....	17
2.2 Superficial Deposits and Landslips map (1:50,000 scale).....	18
2.2 Superficial Deposits and Landslips.....	19
2.2.1 Superficial Deposits/ Drift Geology.....	19
2.2.2 Permeability of Superficial Ground.....	19
2.2.3 Landslip.....	19
2.2.4 Landslip Permeability.....	19
2.3 Bedrock and linear features map (1:50,000 scale).....	20
2.3 Bedrock, Solid Geology & linear features.....	21
2.3.1 Bedrock/Solid Geology.....	21
2.3.2 Permeability of Bedrock Ground.....	21
2.3.3 Linear features.....	21
3 Radon Data.....	22
3.1 Radon Affected Areas.....	22
3.2 Radon Protection.....	22
4 Ground Workings map.....	23
4 Ground Workings.....	24
4.1 Historical Surface Ground Working Features derived from Historical Mapping.....	24
4.2 Historical Underground Working Features derived from Historical Mapping.....	25
4.3 Current Ground Workings.....	25
5 Mining, Extraction & Natural Cavities.....	28
5.1 Historical Mining.....	28
5.2 Coal Mining.....	28
5.3 Johnson Poole and Bloomer.....	28
5.4 Non-Coal Mining.....	28
5.5 Non-Coal Mining Cavities.....	29
5.6 Natural Cavities.....	29
5.7 Brine Extraction.....	29
5.8 Gypsum Extraction.....	29
5.9 Tin Mining.....	29
5.10 Clay Mining.....	30
6 Natural Ground Subsidence.....	31
6.1 Shrink-Swell Clay map.....	31
6.2 Landslides map.....	32
6.3 Ground Dissolution of Soluble Rocks map.....	33
6.4 Compressible Deposits map.....	34
6.5 Collapsible Deposits map.....	35
6.6 Running Sand map.....	36

6 Natural Ground Subsidence.....	37
6.1 Shrink-Swell Clays.....	37
6.2 Landslides.....	37
6.3 Ground Dissolution of Soluble Rocks.....	38
6.4 Compressible Deposits.....	38
6.5 Collapsible Deposits.....	38
6.6 Running Sands.....	38
7 Borehole Records.....	40
8 Estimated Background Soil Chemistry.....	41
9 Railways and Tunnels map.....	42
9 Railways and Tunnels.....	43
9.1 Tunnels	43
9.2 Historical Railway and Tunnel Features	43
9.3 Historical Railways.....	44
9.4 Active Railways.....	44
9.5 Railway Projects.....	44

Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	Yes
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	Yes
	1.2.2 Are there any records of landslip within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	No

Section 2: Geology 1:50,000 Scale

2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	Yes
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features

2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?

Yes

2.3.3 Are there any records of linear features within 500m of the study site boundary?

No

Section 3: Radon

3. Radon

3.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

3.2 Radon Protection

No radon protective measures are necessary.

Section 4: Ground Workings

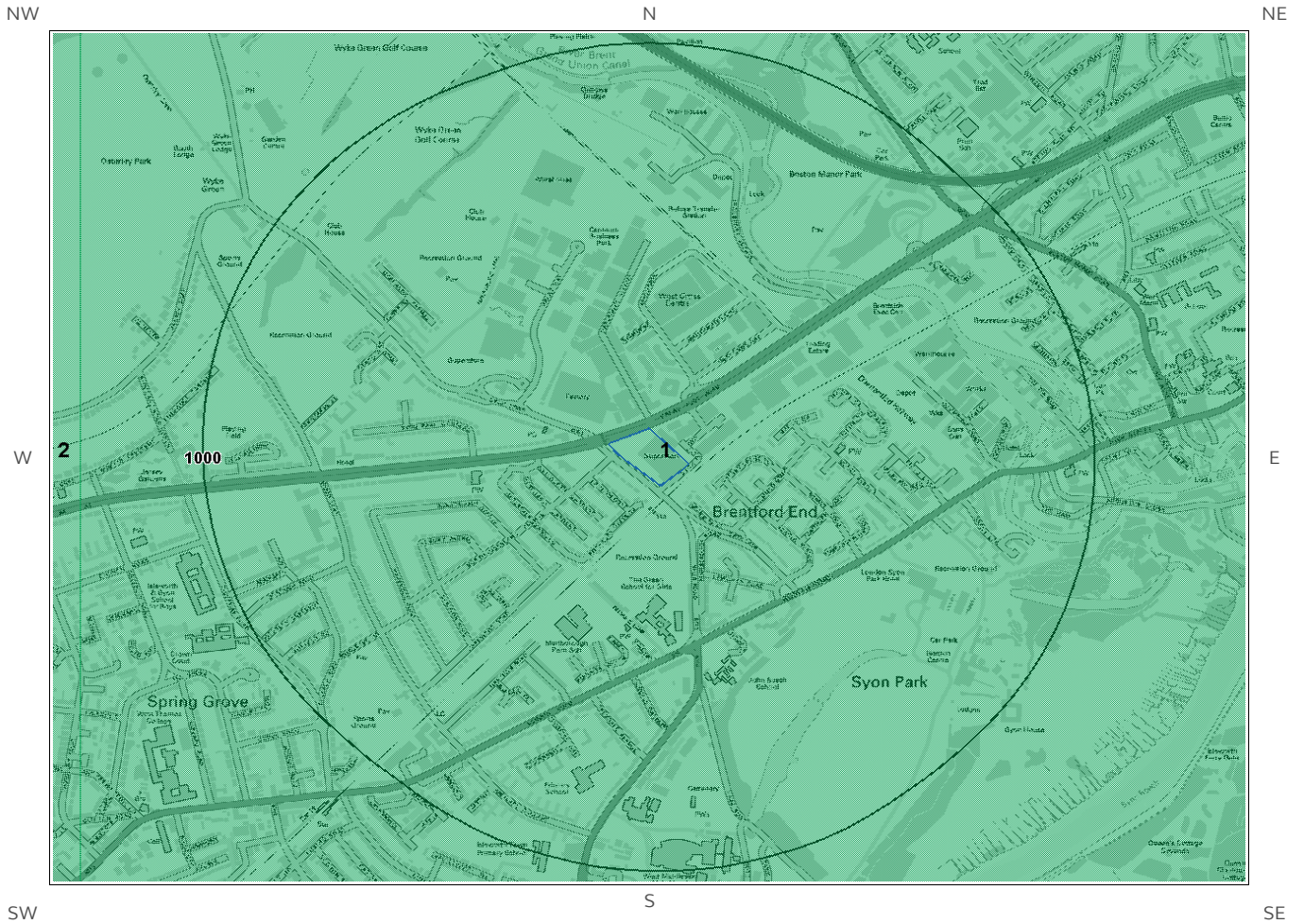
	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	5	11	7	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
4.3 Current Ground Workings	0	0	0	0	10

Section 5: Mining, Extraction & Natural Cavities

	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	0	0	0
5.2 Coal Mining	0	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	0	0	0	0	0
5.5 Non-Coal Mining Cavities	0	0	0	0	0
5.5 Natural Cavities	0	0	0	0	0

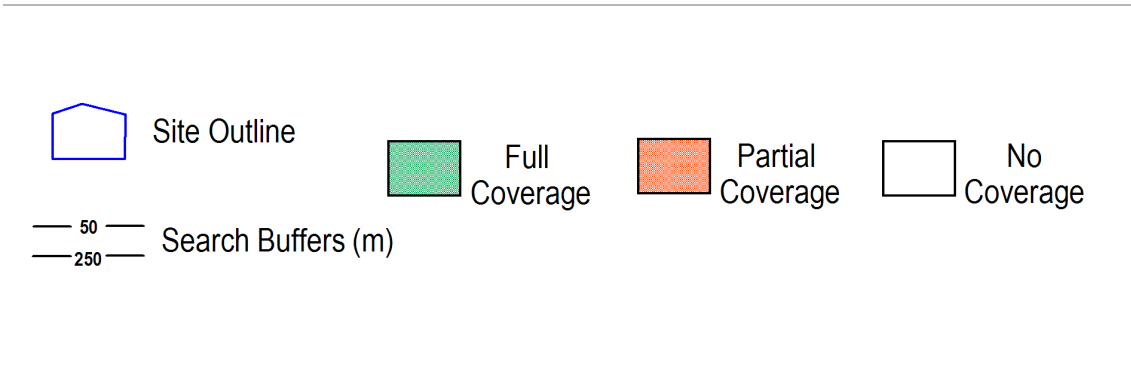
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Moderate				
6.2 Landslides	Very Low				
6.3 Ground Dissolution of Soluble Rocks	Negligible				
6.4 Compressible Deposits	Negligible				
6.5 Collapsible Deposits	Very Low				
6.5 Running Sand	Very Low				
Section 7: Borehole Records	On-site	0-50m	51-250		
7 BGS Recorded Boreholes	0	0	4		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	3	0	0		
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	
9.2 Historical Railway and Tunnel Features	4	4	0	Not Searched	
9.3 Historical Railways	0	0	0	Not Searched	
9.4 Active Railways	0	6	0	Not Searched	
9.5 Railway Projects	0	0	0	0	

1:10,000 Scale Availability



1_10,000 Availability Legend

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Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	Some deposits are mapped	Full	Full	No coverage
2	1303.0	Some deposits are mapped	Full	Full	No coverage

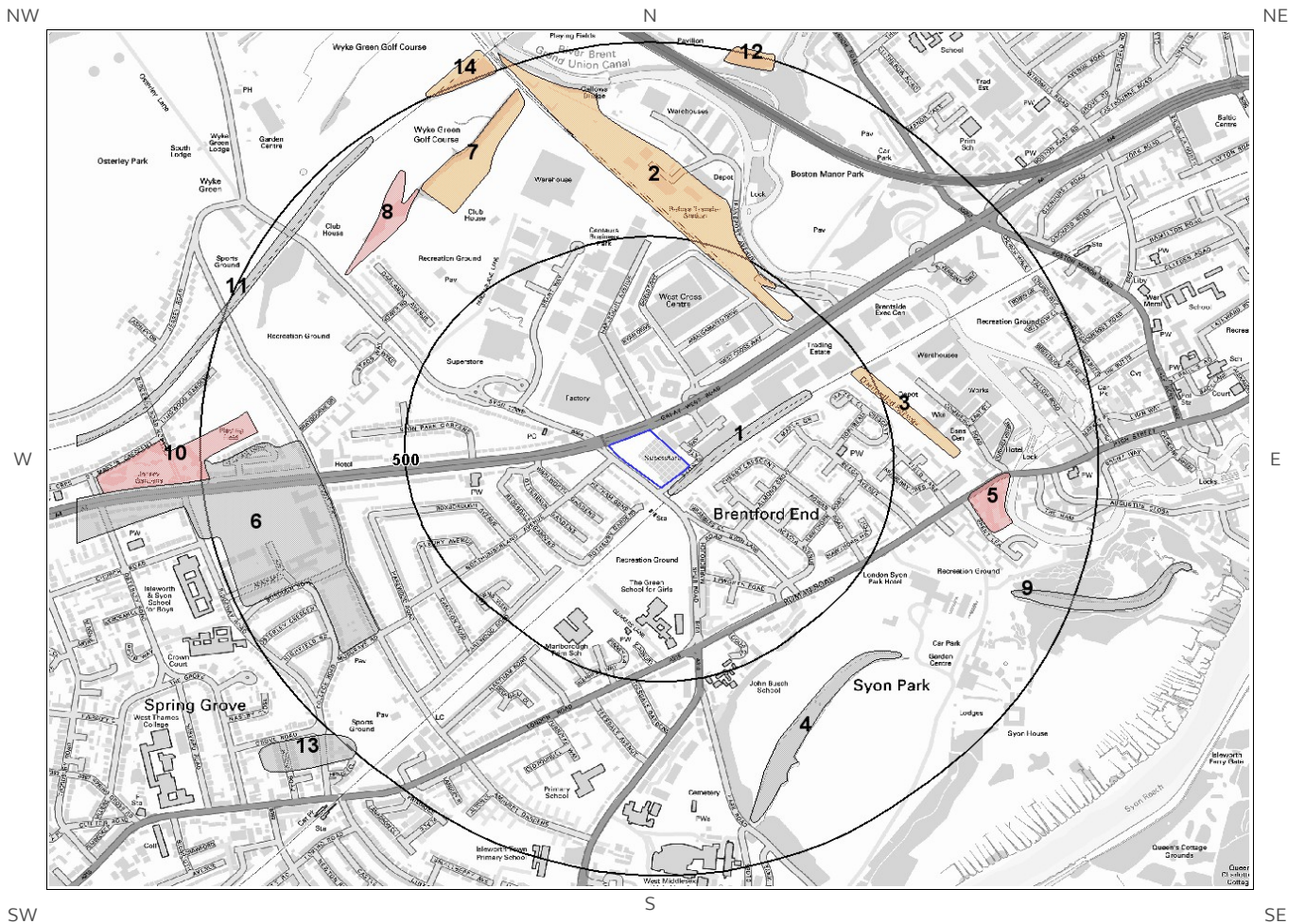
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage




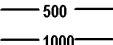




1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

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	Site Outline		Made Ground (undivided)		Disturbed Ground (undivided)
	Search Buffers (m)		Worked Ground (undivided)		Landscaped Ground (undivided)
			Infilled Ground		Reclaimed Ground

1. Geology 1:10,000 scale

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	9.0	SE	WGR- UNKNOWN	Worked Ground (Undivided)	Unknown/unclassified Entry
2	427.0	NE	MGR- UNKNOWN	Made Ground (Undivided)	Unknown/unclassified Entry
3	460.0	NE	MGR- UNKNOWN	Made Ground (Undivided)	Unknown/unclassified Entry

1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TPGR-XSV	Taplow Gravel Formation - Sand And Gravel	Sand And Gravel
2	206.0	NW	LASI-Z	Langley Silt Member - Silt (unlithified Deposits Coding Scheme)	Silt
3	285.0	SE	LASI-Z	Langley Silt Member - Silt (unlithified Deposits Coding Scheme)	Silt
4	497.0	NE	ALV-Z	Alluvium - Silt (unlithified Deposits Coding Scheme)	Silt

1.2.2 Landslip

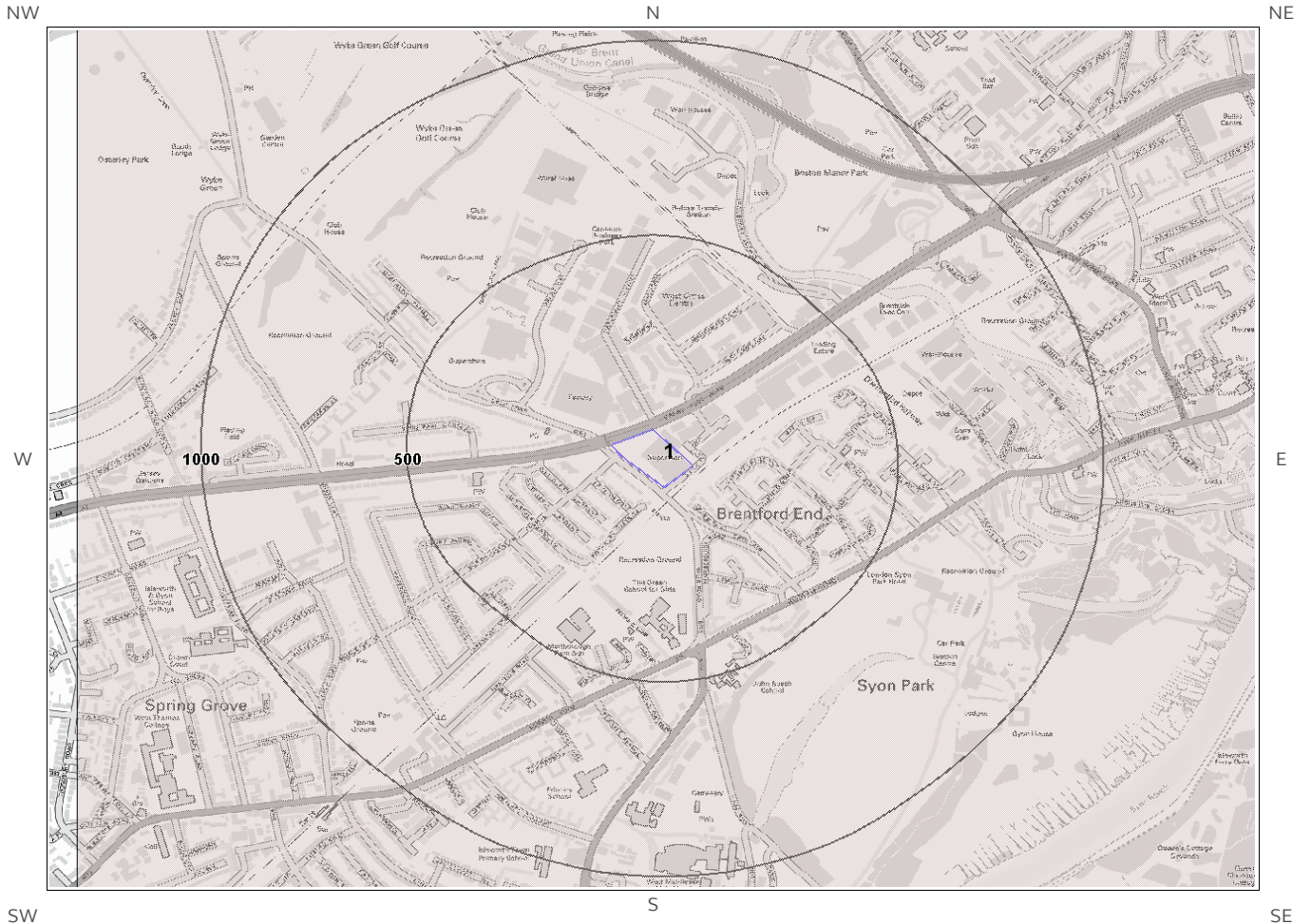
Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale


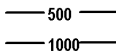
This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)



Bedrock and linear features Legend

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-  Site Outline
-  Search Buffers (m)

1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	LC-CLAY	London Clay Formation - Clay	Eocene Epoch

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? No

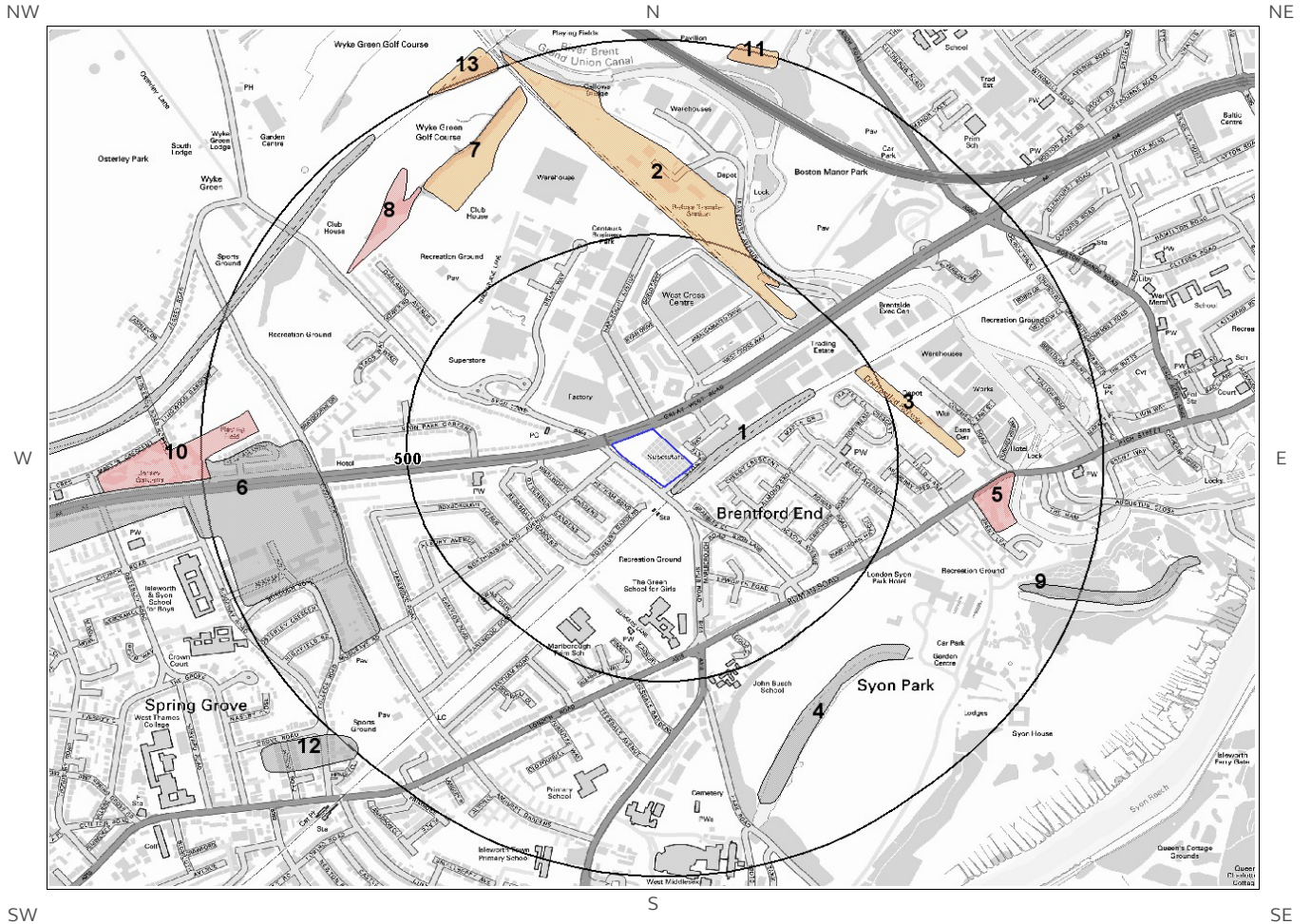
Database searched and no data found at this scale.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

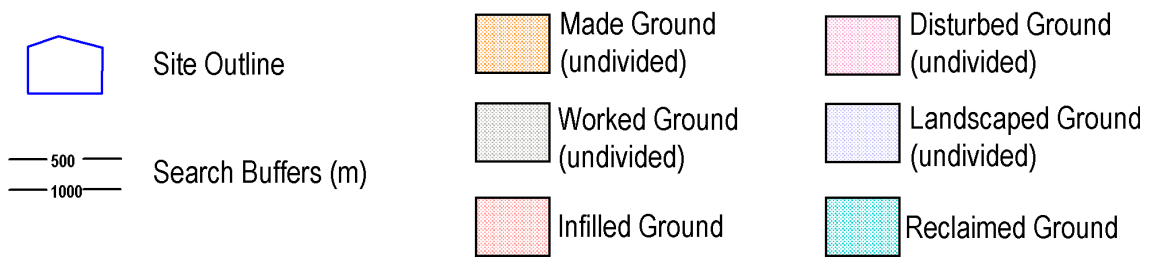
This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



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2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 270

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? Yes

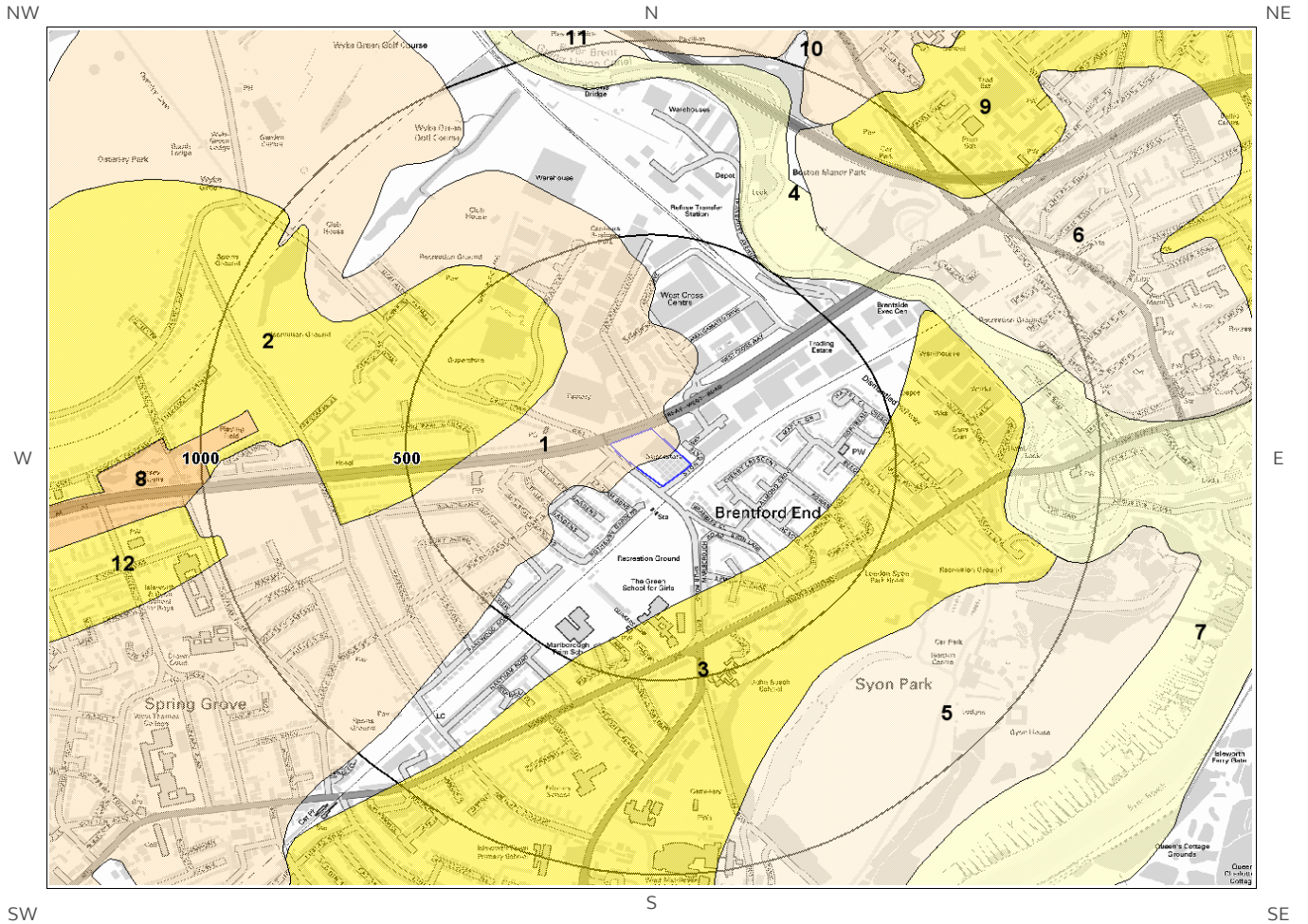
ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	9.0	SE	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
2	427.0	NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
3	460.0	NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

2.1.2 Permeability of Artificial Ground

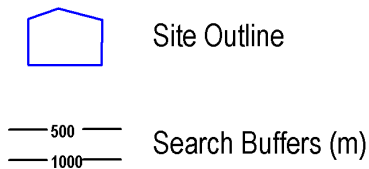
Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

2.2 Superficial Deposits and Landslips map (1:50,000 scale)



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2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TPGR-XSV	TAPLOW GRAVEL MEMBER	SAND AND GRAVEL
2	206.0	NW	LASI-XCZ	LANGLEY SILT MEMBER	CLAY AND SILT
3	285.0	SE	LASI-XCZ	LANGLEY SILT MEMBER	CLAY AND SILT
4	497.0	NE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Very High	High

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

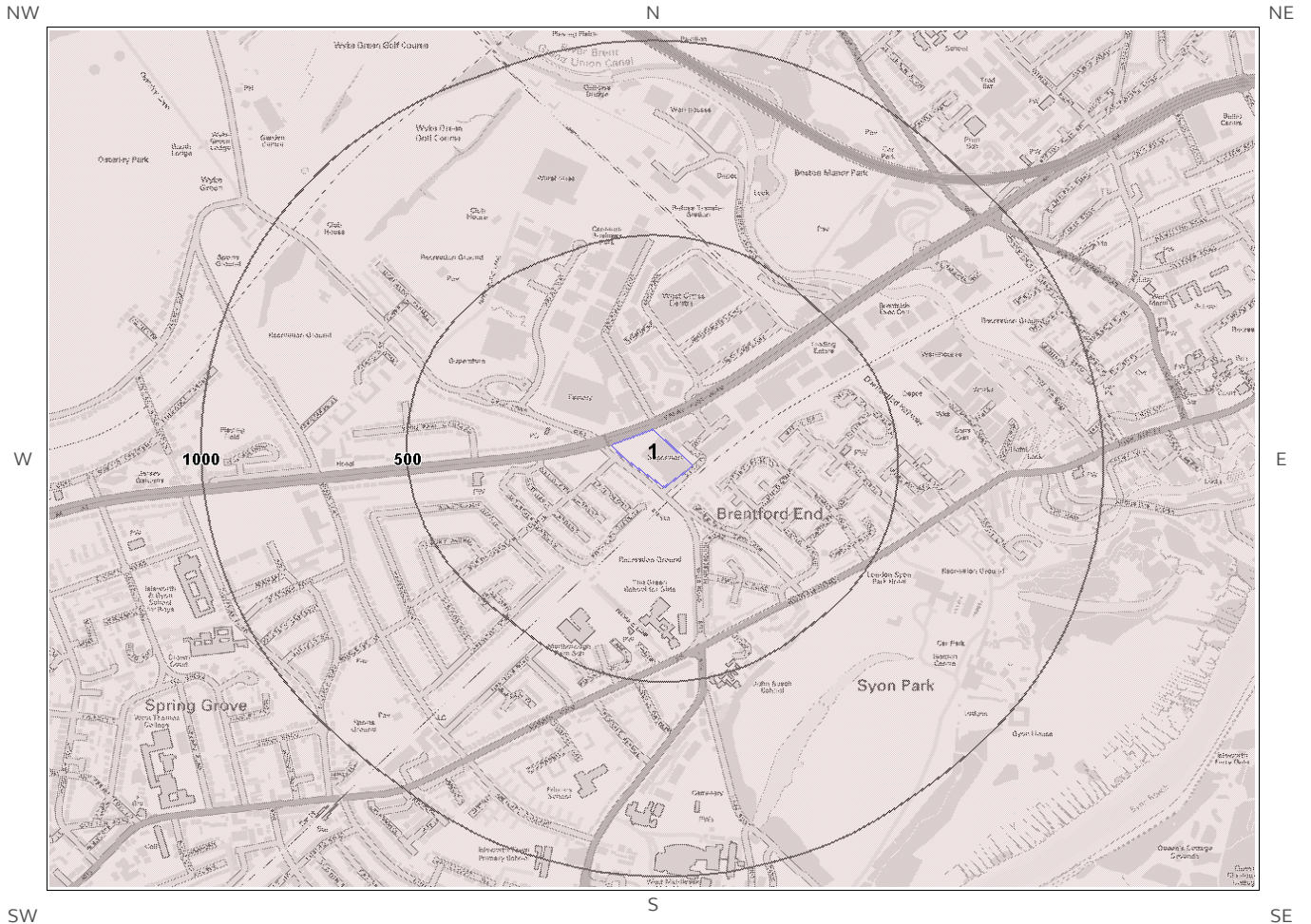
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

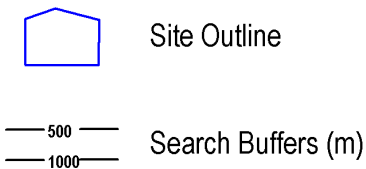
Are there any records relating to permeability of landslips within the study site boundary? No

Database searched and no data found.

2.3 Bedrock and linear features map (1:50,000 scale)



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2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 270

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	LC-XCZ	LONDON CLAY FORMATION - CLAY AND SILT	YPRESIAN

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	Low	Very Low

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

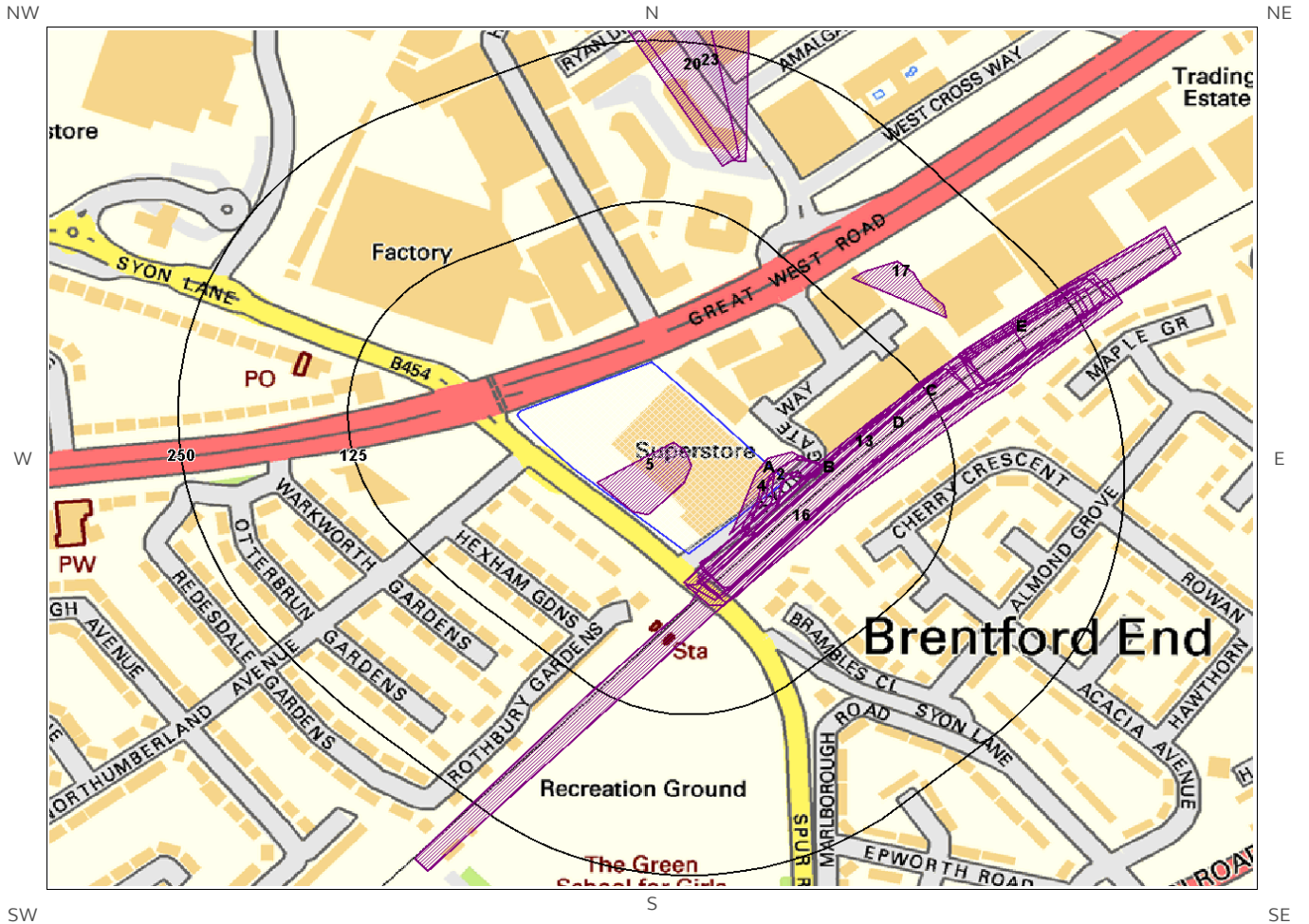
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection



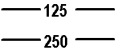


Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

4 Ground Workings map



Ground Workings Legend

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-  Site Outline
-  Historic Surface Ground Workings
-  Search Buffers (m)
-  Historic Underground Workings
-  Current Ground Workings

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1A	0.0	On Site	516479 177295	Pond	1894
2	0.0	On Site	516488 177292	Pond	1865
3A	0.0	On Site	516489 177293	Pond	1894
4	0.0	On Site	516480 177289	Pond	1938
5	0.0	On Site	516396 177307	Unspecified Heap	1938
6B	7.0	SE	516574 177333	Cuttings	1933
7B	7.0	SE	516574 177333	Cuttings	1894
8C	8.0	SE	516612 177359	Cuttings	1974
9C	8.0	SE	516612 177359	Cuttings	1966
10C	8.0	SE	516614 177362	Cuttings	1987
11B	11.0	SE	516536 177305	Cuttings	1938
12B	11.0	SE	516536 177305	Cuttings	1912
13	12.0	SE	516562 177327	Cuttings	1940
14D	16.0	SE	516583 177335	Cuttings	1912
15D	17.0	SE	516587 177333	Cuttings	1894
16	17.0	SE	516464 177232	Cuttings	1865
17	148.0	NE	516584 177454	Unspecified Heap	1940
18E	159.0	NE	516675 177415	Cuttings	1894
19E	161.0	NE	516682 177422	Cuttings	1912
20	161.0	N	516393 177688	Unspecified Pit	1940
21E	163.0	NE	516677 177419	Cuttings	1938

ID	Distance (m)	Direction	NGR	Use	Date
22E	165.0	NE	516687 177423	Cuttings	1933
23	168.0	N	516422 177704	Unspecified Ground Workings	1938

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

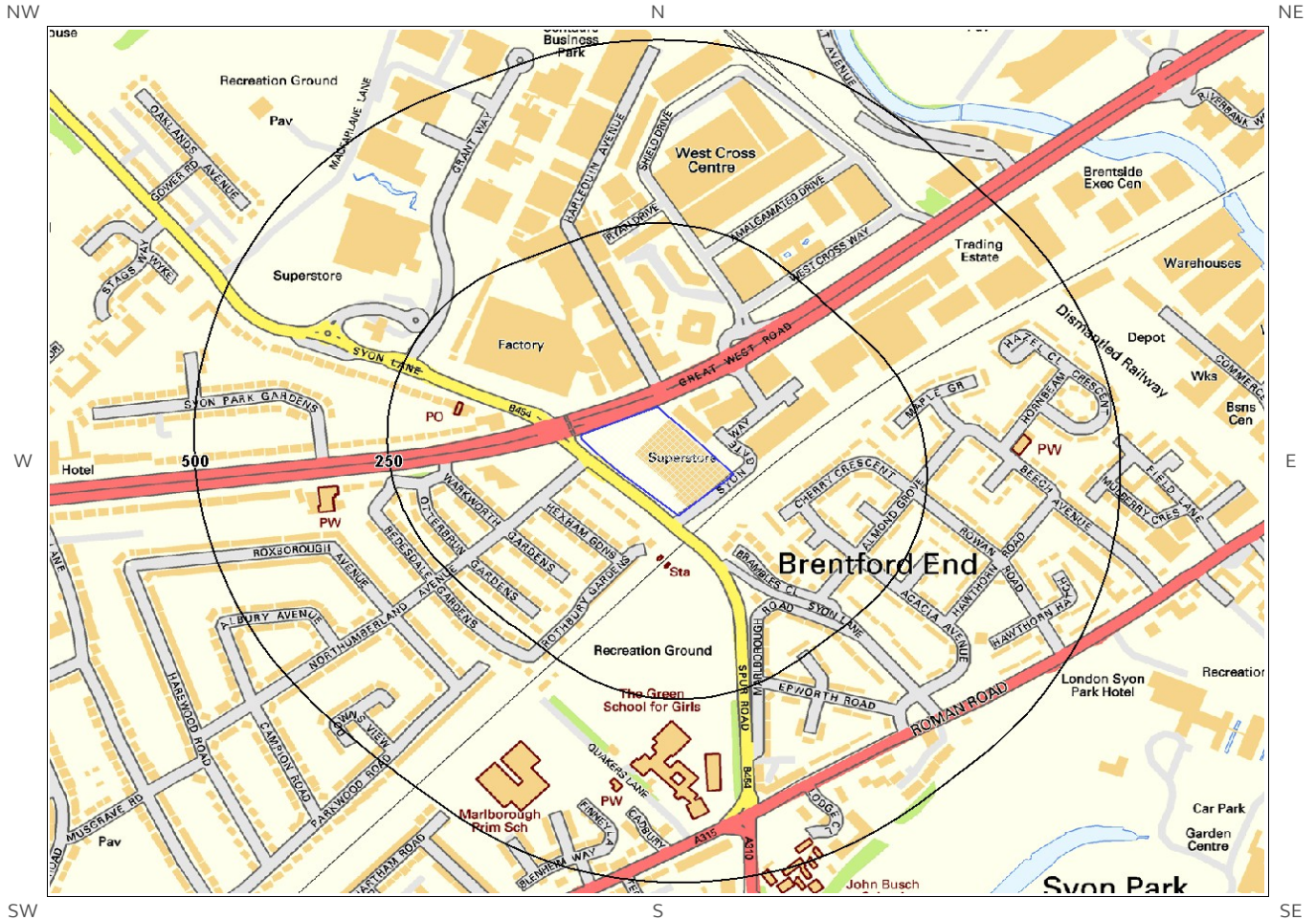
Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	593.0	N	516425 177990	Marine Sand & Gravel	Brentford Rail Depot	A site where mineral commodities are unloaded from rail trucks and stored	Active
Not shown	593.0	N	516425 177990	Secondary	Brentford Rail Depot	A site where mineral commodities are unloaded from rail trucks and stored	Active
Not shown	593.0	N	516425 177990	Crushed Rock	Brentford Rail Depot	A site where mineral commodities are unloaded from rail trucks and stored	Active
Not shown	751.0	SW	515665 176960	Sand & Gravel	Wood Lane Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	787.0	W	515518 177303	Clay & Shale	Spring Grove Brick Fields	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	821.0	W	515505 177163	Clay & Shale	Spring Grove Brick Fields	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	827.0	W	515524 177079	Sand & Gravel	Wood Lane Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	910.0	W	515399 177247	Clay & Shale	Spring Grove Brick Fields	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	922.0	W	515381 177390	Clay & Shale	Scrattage Brick Fields	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

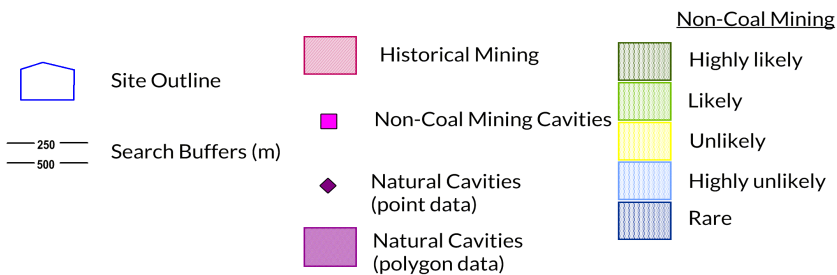
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	999.0	W	515318 177190	Clay & Shale	Spring Grove Brick Fields	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

5 Mining, Extraction & Natural Cavities map



Mining, Extraction and Natural Cavities Legend

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5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

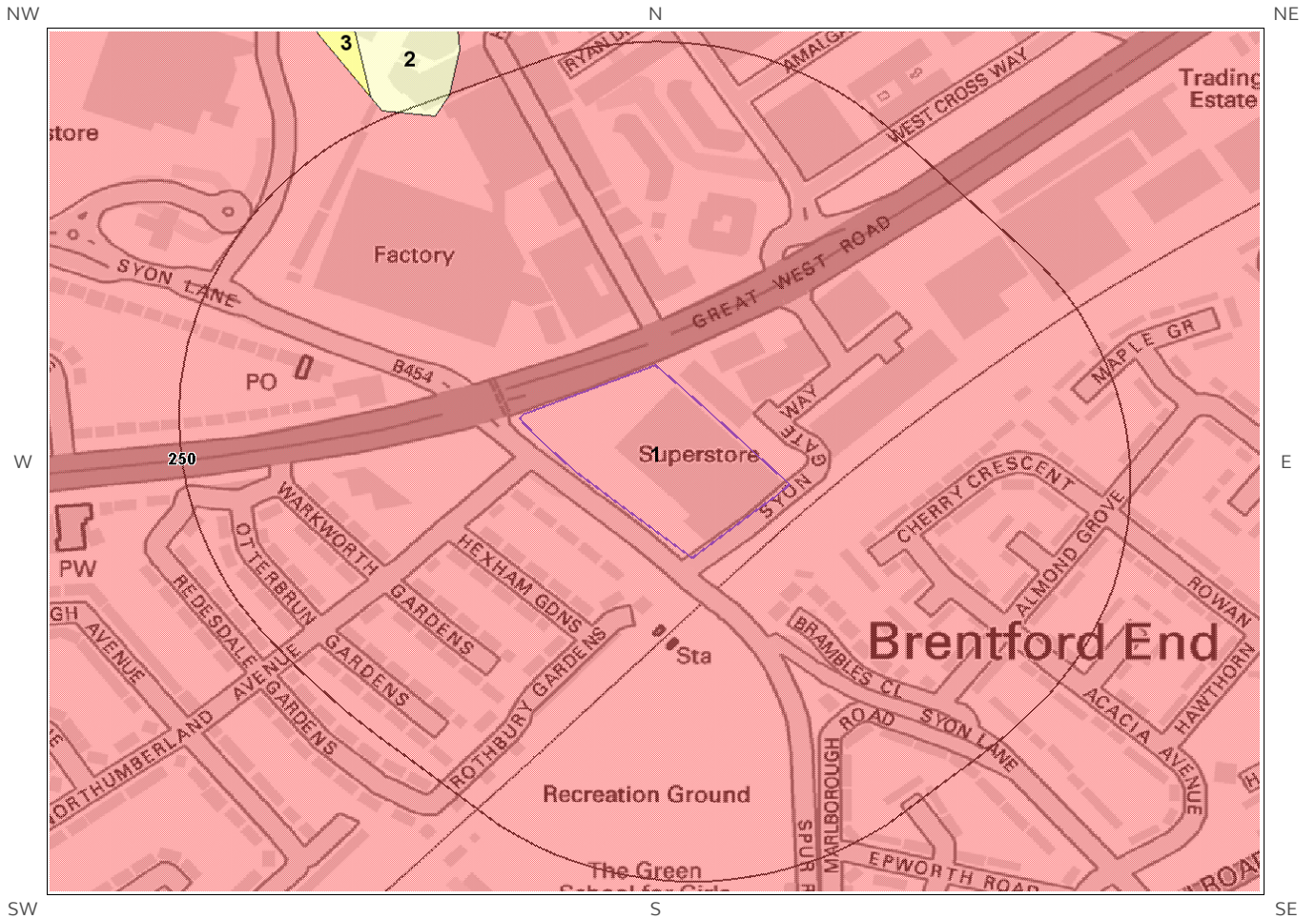
Are there any Clay Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map

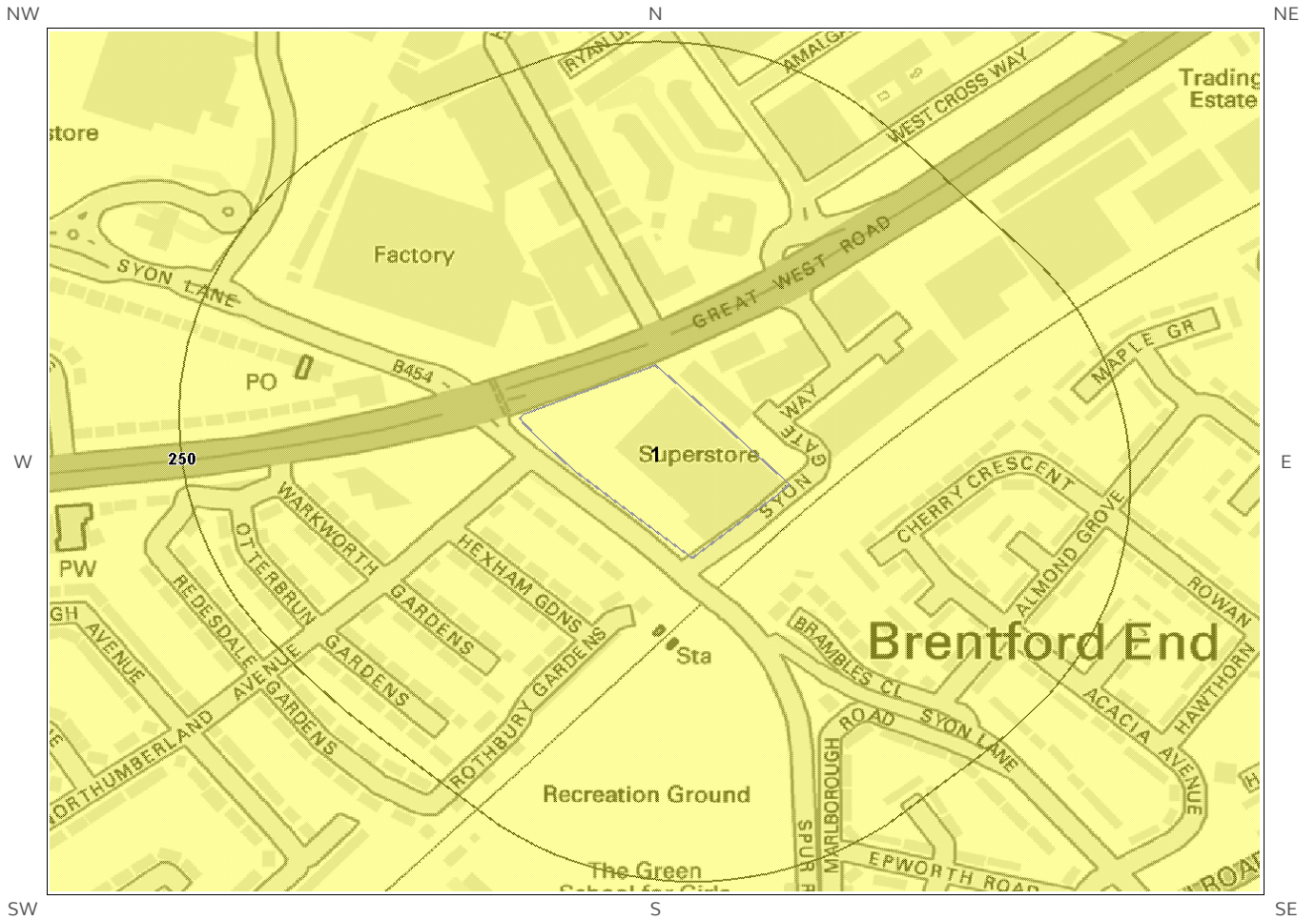


Shrink Swell Clay Legend

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6.2 Landslides map

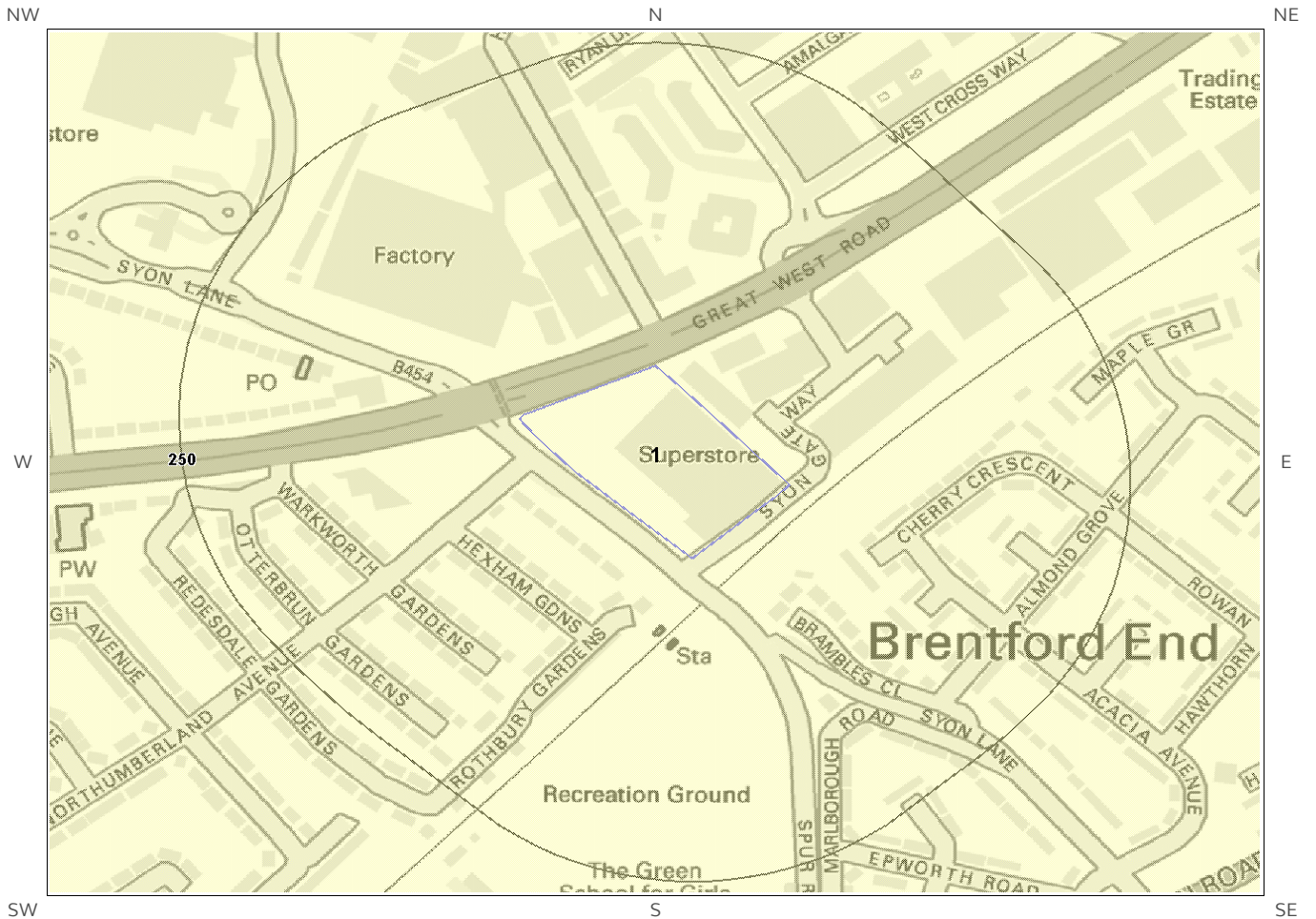


Landslides Legend

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6.3 Ground Dissolution of Soluble Rocks map



Ground Dissolution Soluble Rocks Legend

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6.4 Compressible Deposits map

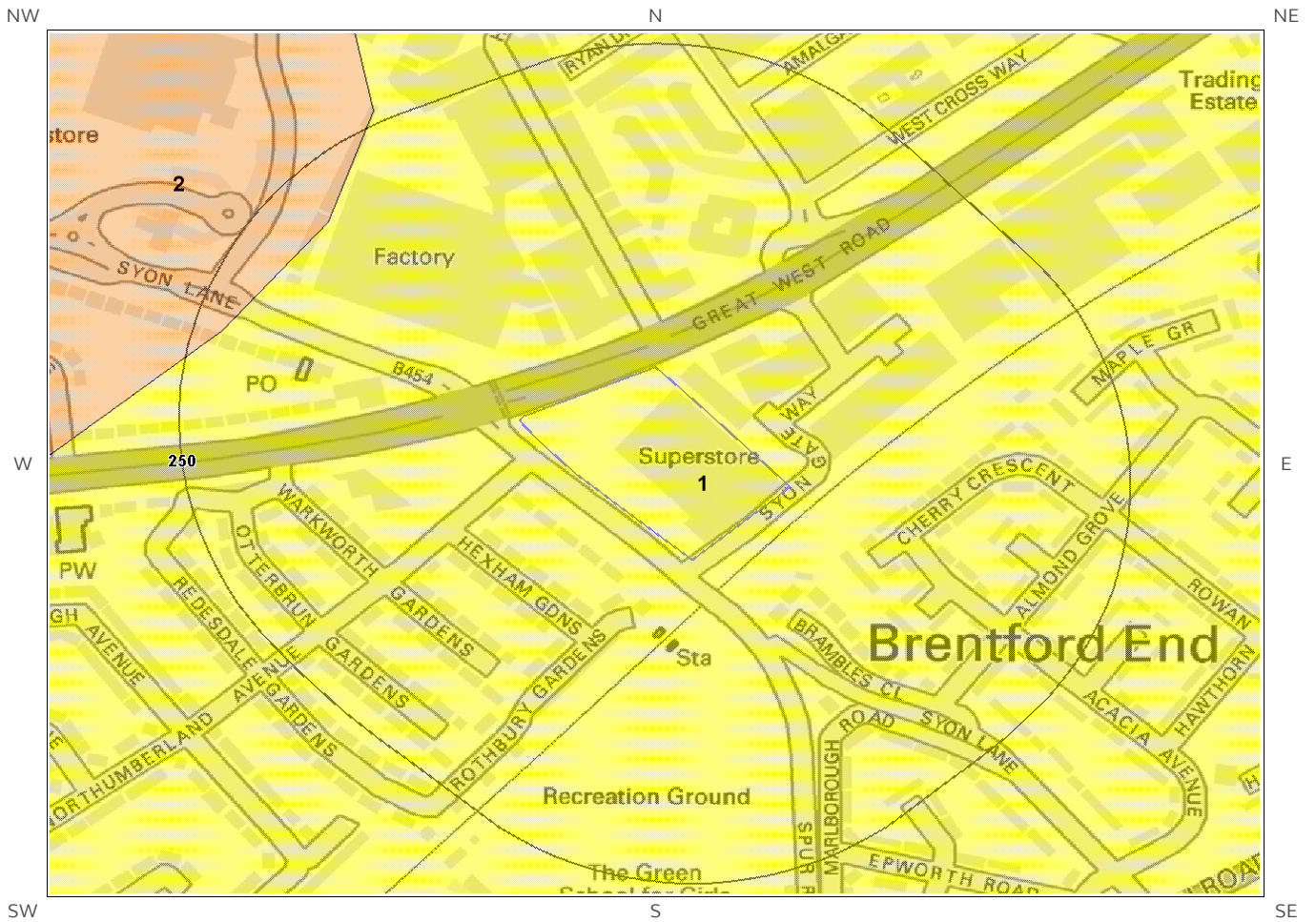


Compressible Deposits Legend

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6.5 Collapsible Deposits map

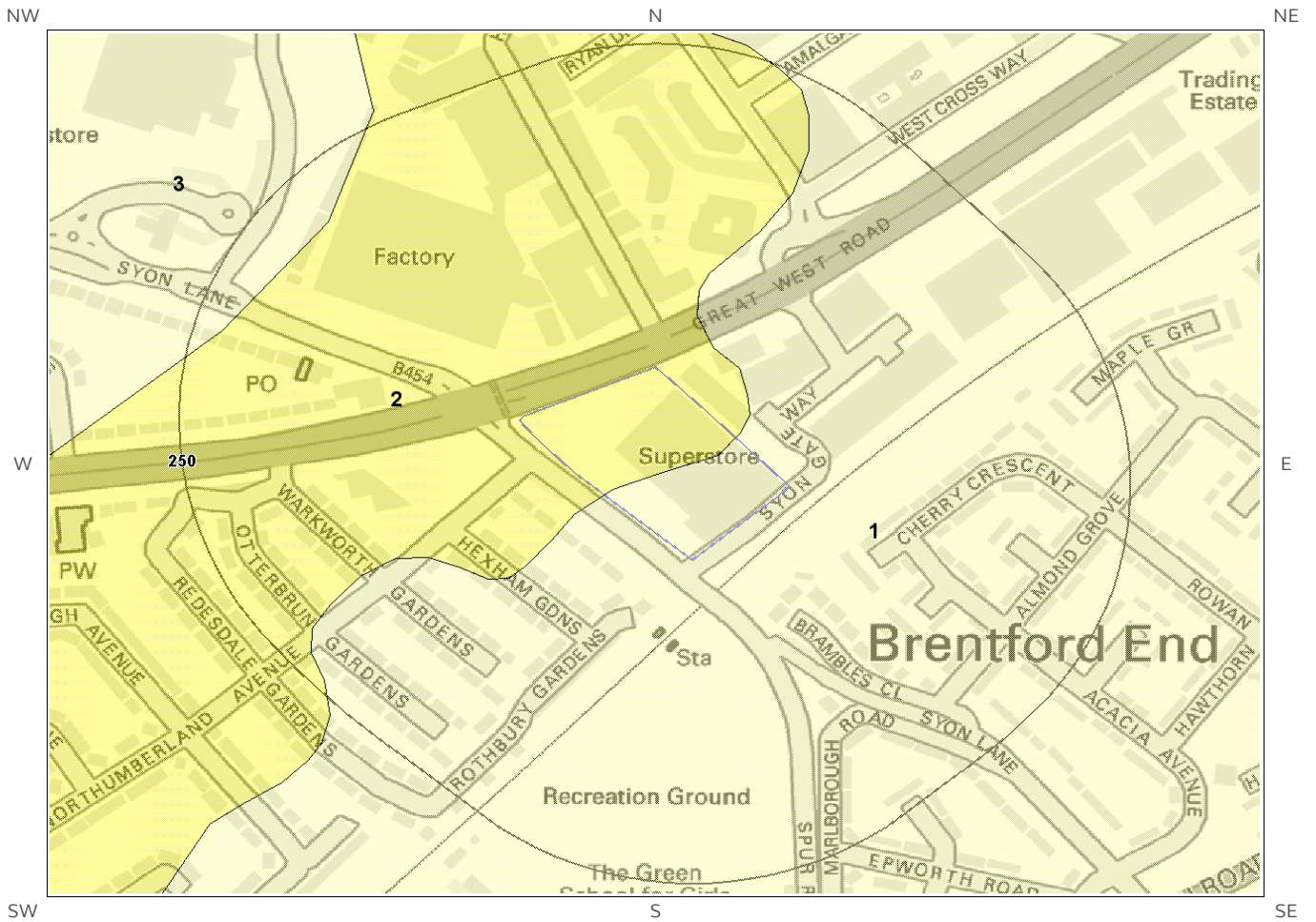


Collapsible Deposits Legend

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6.6 Running Sand map



Running Sand Legend

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6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site** boundary? Moderate

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Moderate	Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

* This includes an automatically generated 50m buffer zone around the site

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

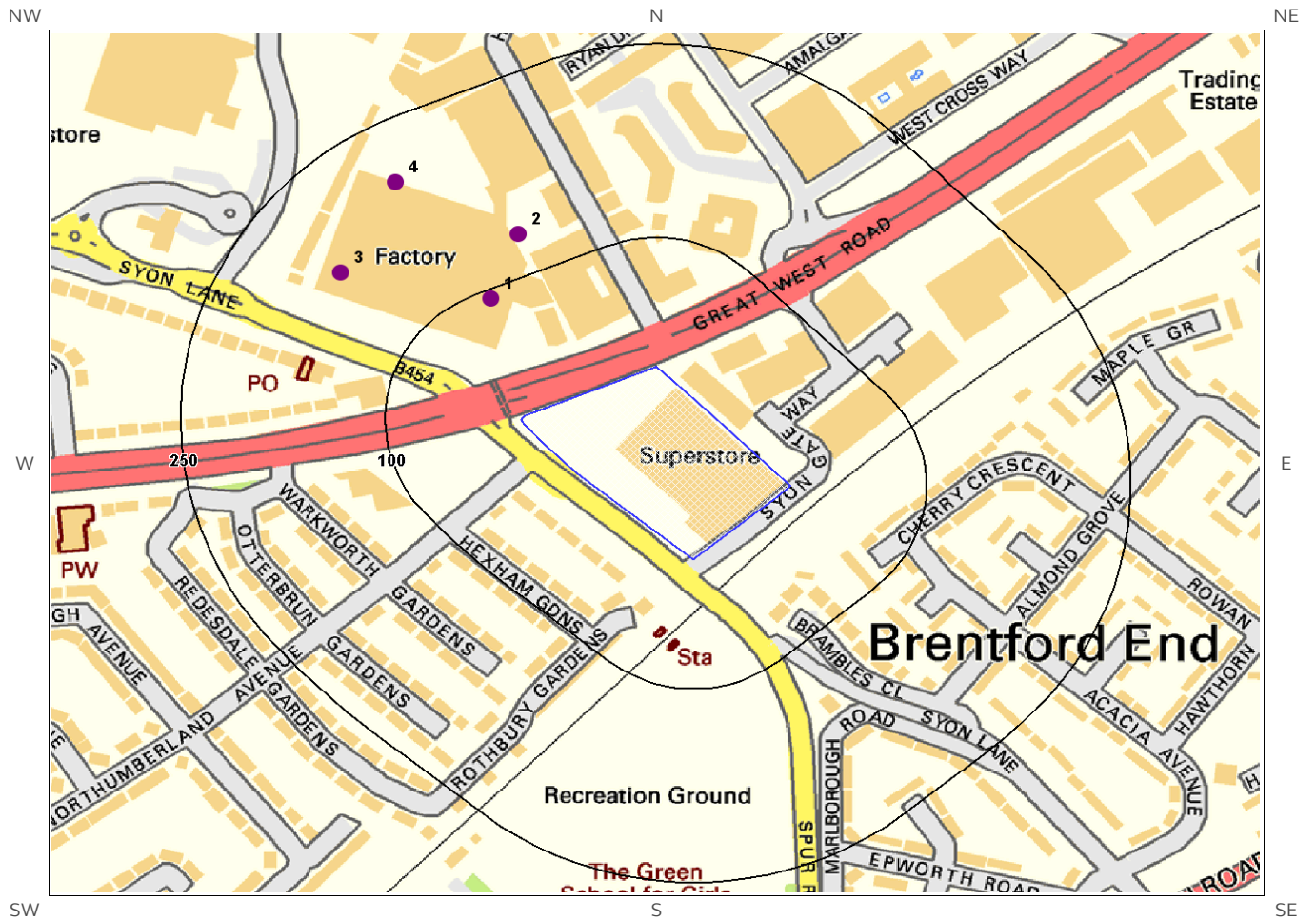
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

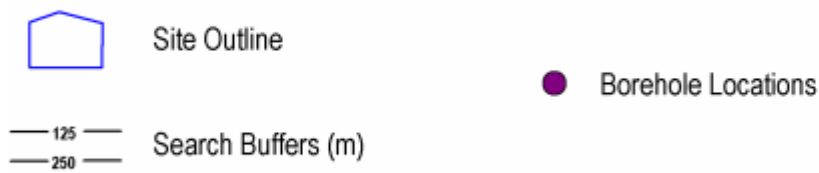
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

7 Borehole Records map



Borehole Records Legend

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7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

4

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	93.0	N	516280 177450	TQ17NE484	-1.0	GILLETTE UK LIMITED 4
2	132.0	N	516300 177500	TQ17NE483	-1.0	GILLETTE UK LIMITED 3
3	174.0	NW	516170 177470	TQ17NE481	-1.0	GILLETTE UK LIMITED 1
4	203.0	NW	516210 177540	TQ17NE482	-1.0	GILLETTE UK LIMITED 2

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

8 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

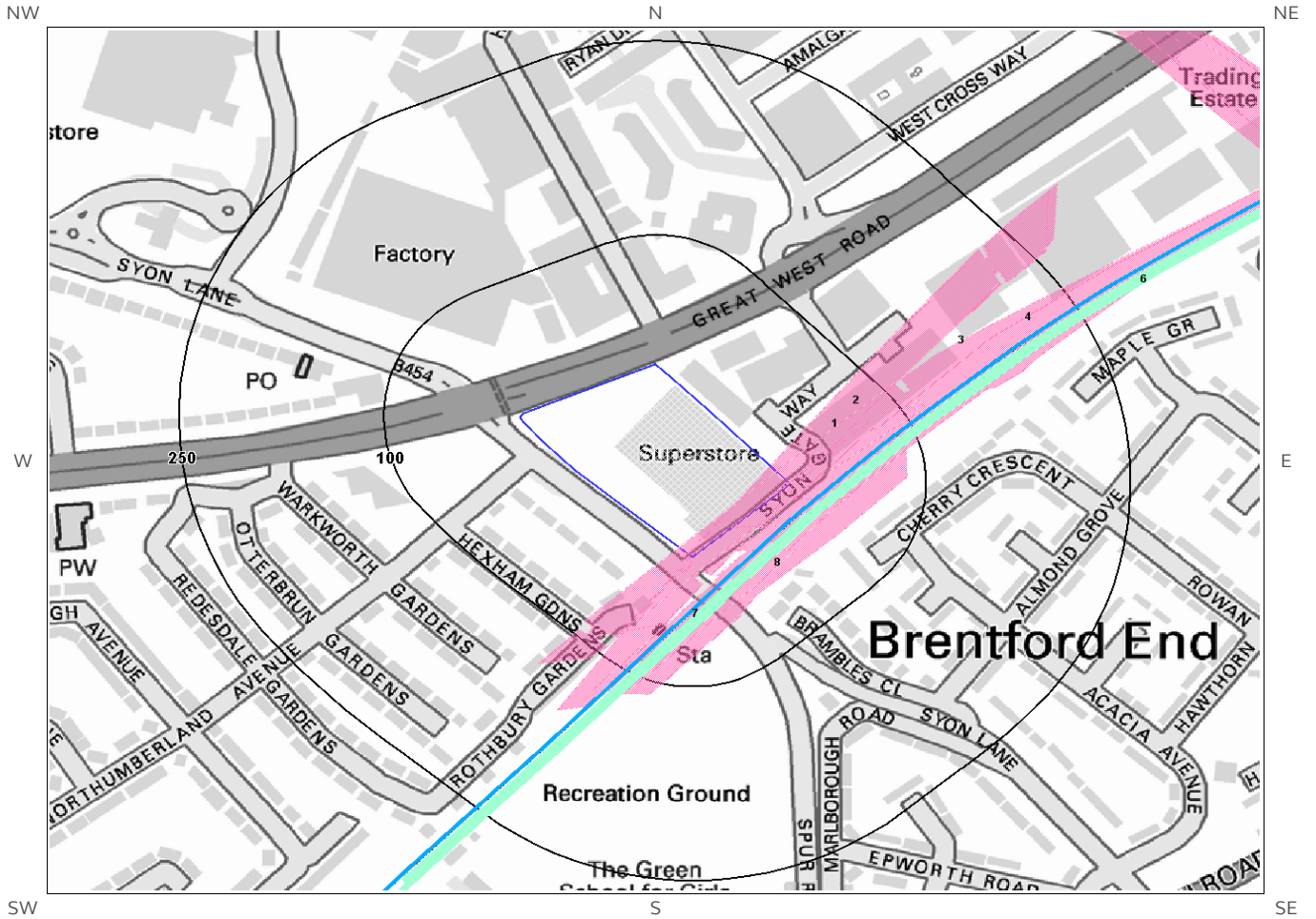
3

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	E	London	No data	No data	No data	No data	No data
0.0	On Site	London	No data	No data	No data	No data	No data
0.0	On Site	London	No data	No data	No data	No data	No data













*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend

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- | | | | |
|---|--|---|-------------------------------------|
|  | Underground or Partially Underground Railway / Subway System |  | Railway Track (OpenStreetMap) |
|  | Railway Tunnel (OS Mapping) |  | High Speed 2 |
|  | Abandoned or Dismantled Railway (OpenStreetMap) |  | High Speed 2 Revised Proposed Route |
|  | Railway Track (OS Mapping) |  | Crossrail 1 |
|  | Railway and/or Tunnel Feature from Historical Mapping | | |
-
- | | |
|---|------------------------|
|  | Site Outline |
|  | 250 Search Buffers (m) |
|  | 500 Search Buffers (m) |

9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? Yes

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	0	On Site	n/a	Railway	1870
2	0	On Site	n/a	Railway	1915
3	0	On Site	n/a	Railway	1897
4	0	On Site	n/a	Railway	1936
5	11	SE	n/a	Railway	1915
6	11	SE	n/a	Railway	1880
7	20	SE	n/a	Railway	1915
8	30	SE	n/a	Railway	1871

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Name	Type
22	SE	Not given	Multi Track
22	SE	Not given	Multi Track
27	SE	Hounslow Loop Line	Rail
27	SE	Hounslow Loop Line	Rail
31	SE	Hounslow Loop Line	Rail
31	SE	Hounslow Loop Line	Rail

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

Contact Details

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DX 716176 Mansfield 5
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<https://www.gov.uk/government/organisations/public-health-england>
Email: enquiries@phe.gov.uk
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Tel: 08456 050505
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Tel: 01252 845444
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Tel: +44 (0)118 950 0761 E-mail: reading@pba.co.uk
Website: <http://www.peterbrett.com/home>



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Site Details:

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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

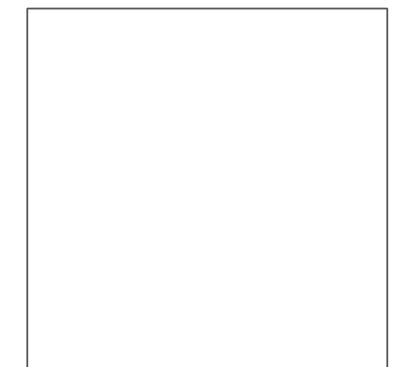
Map date: 1865

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1865
Revised 1865
Edition N/A
Copyright N/A
Levelled N/A



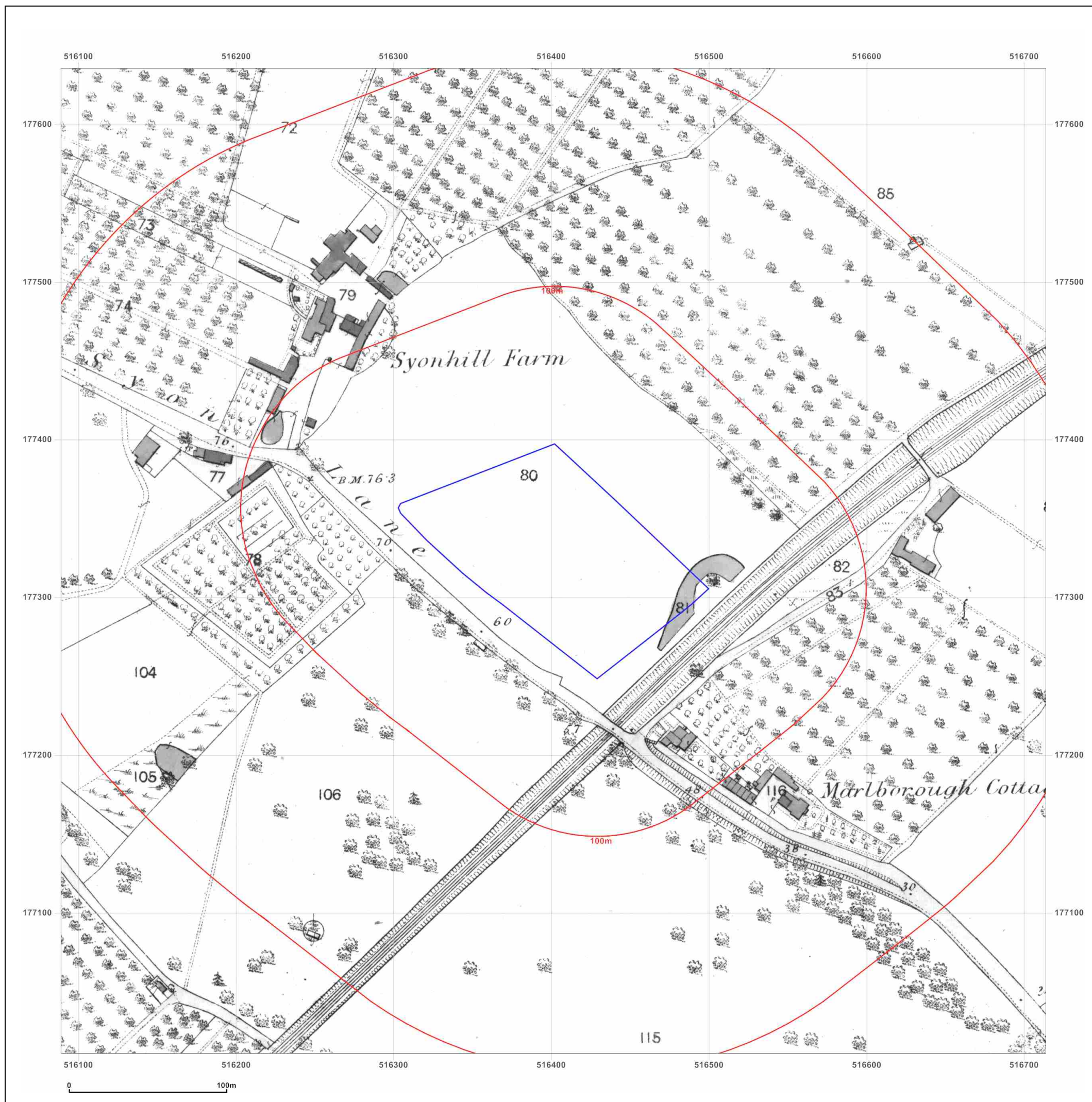
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

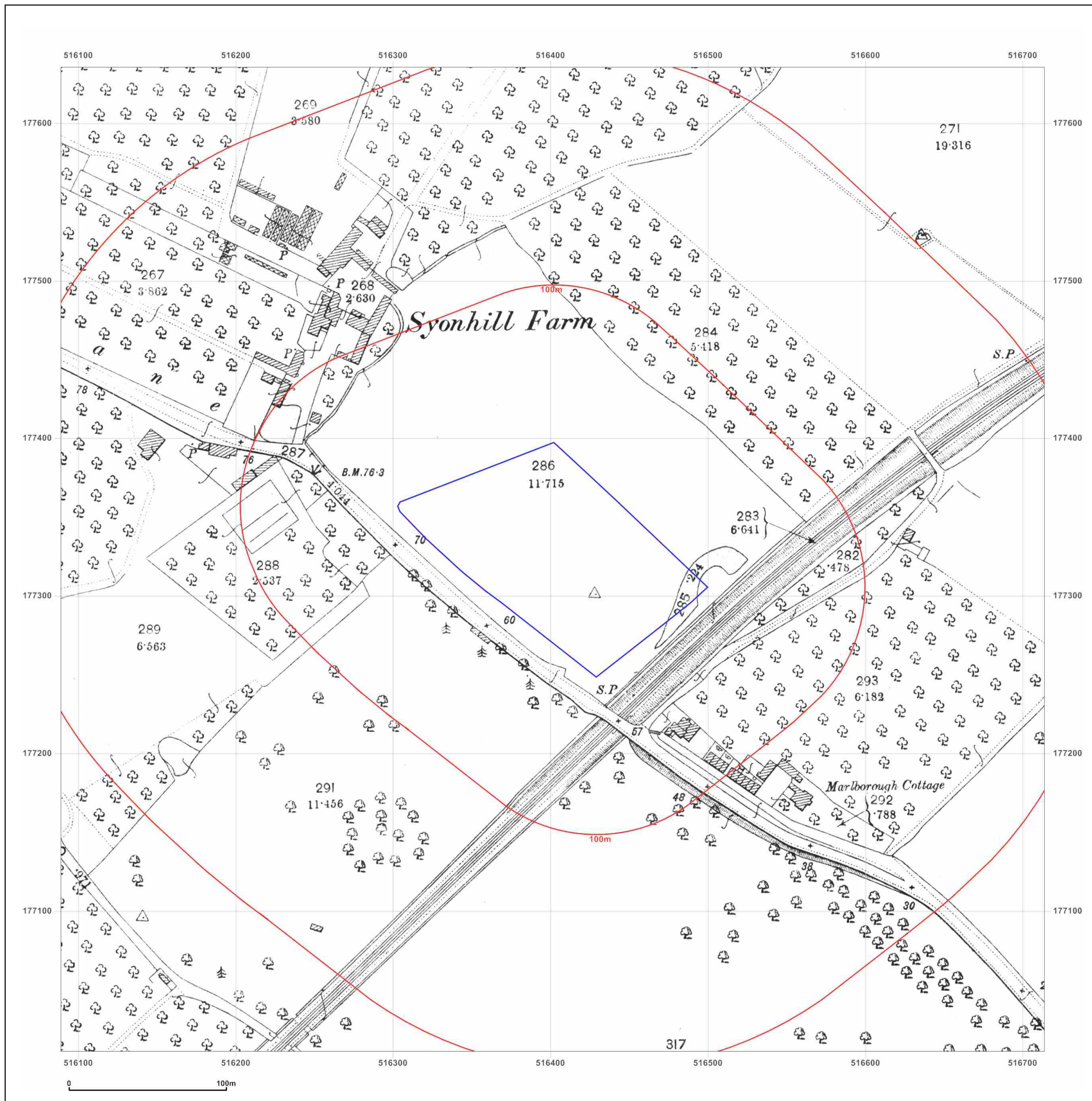
Map date: 1896

Scale: 1:2,500

Printed at: 1:2,500



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Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

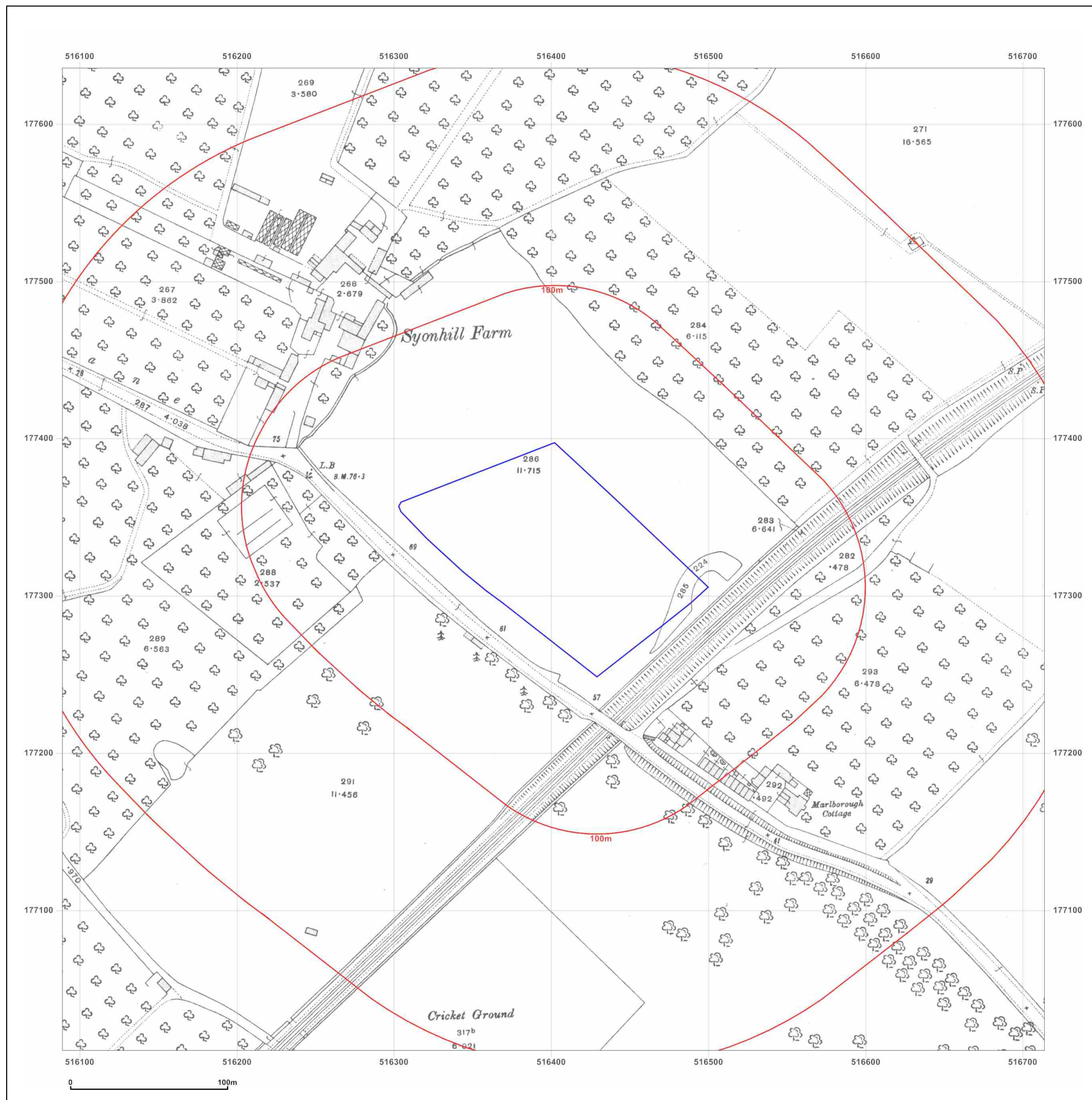
Map date: 1915

Scale: 1:2,500

Printed at: 1:2,500



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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1935
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A



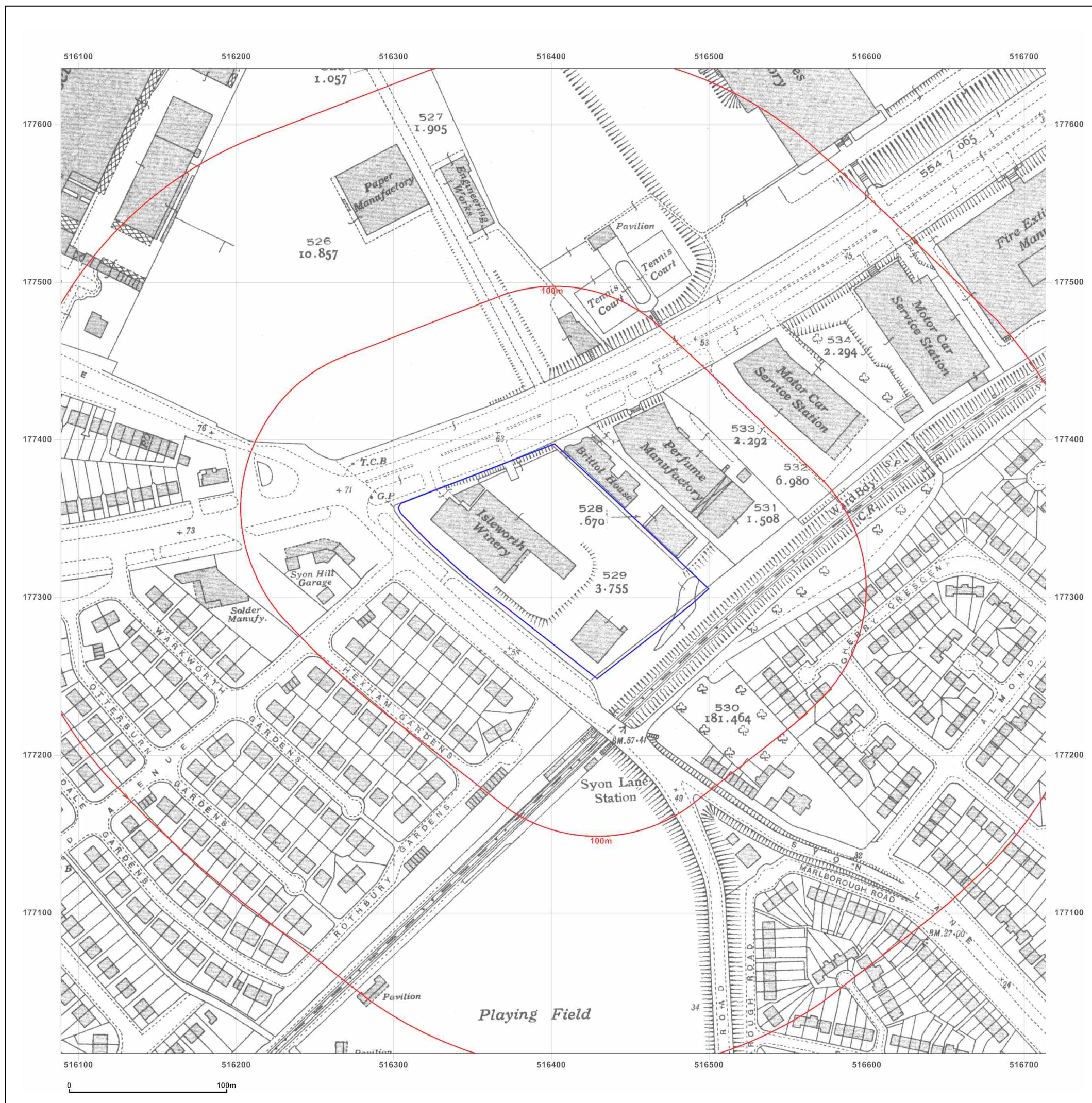
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: National Grid

Map date: 1960

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1960
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Edition N/A
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Revised 1960
Edition N/A
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Revised 1960
Edition N/A
Copyright 1960
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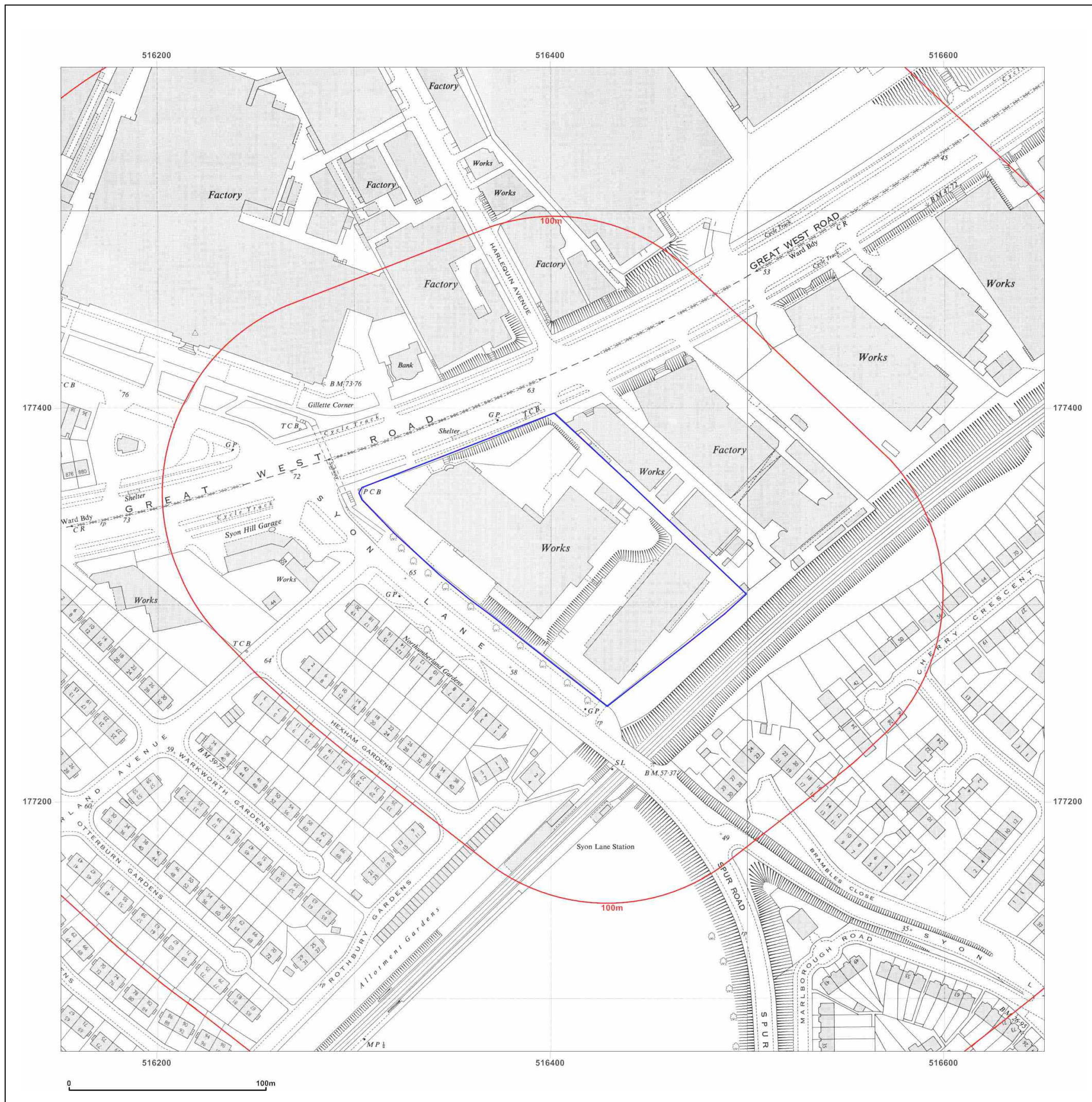
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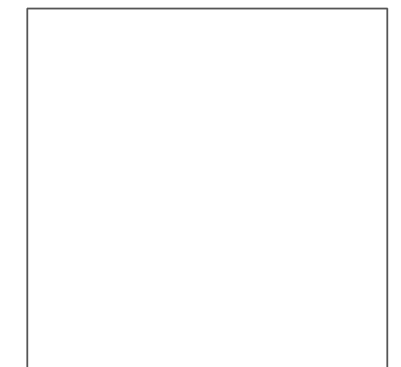
Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
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Edition 1961
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: National Grid

Map date: 1992-1995

Scale: 1:1,250

Printed at: 1:2,000



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1992
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Surveyed N/A
Revised N/A
Edition N/A
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

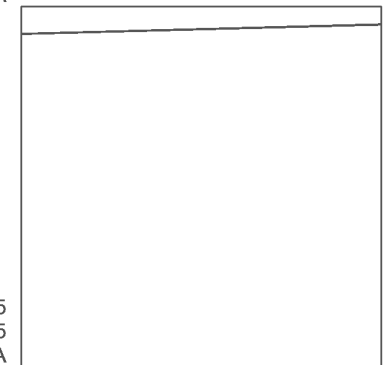
Map date: 1865-1868

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1865
Revised 1865
Edition 1868
Copyright N/A
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Surveyed 1865
Revised 1865
Edition N/A
Copyright N/A
Levelled N/A



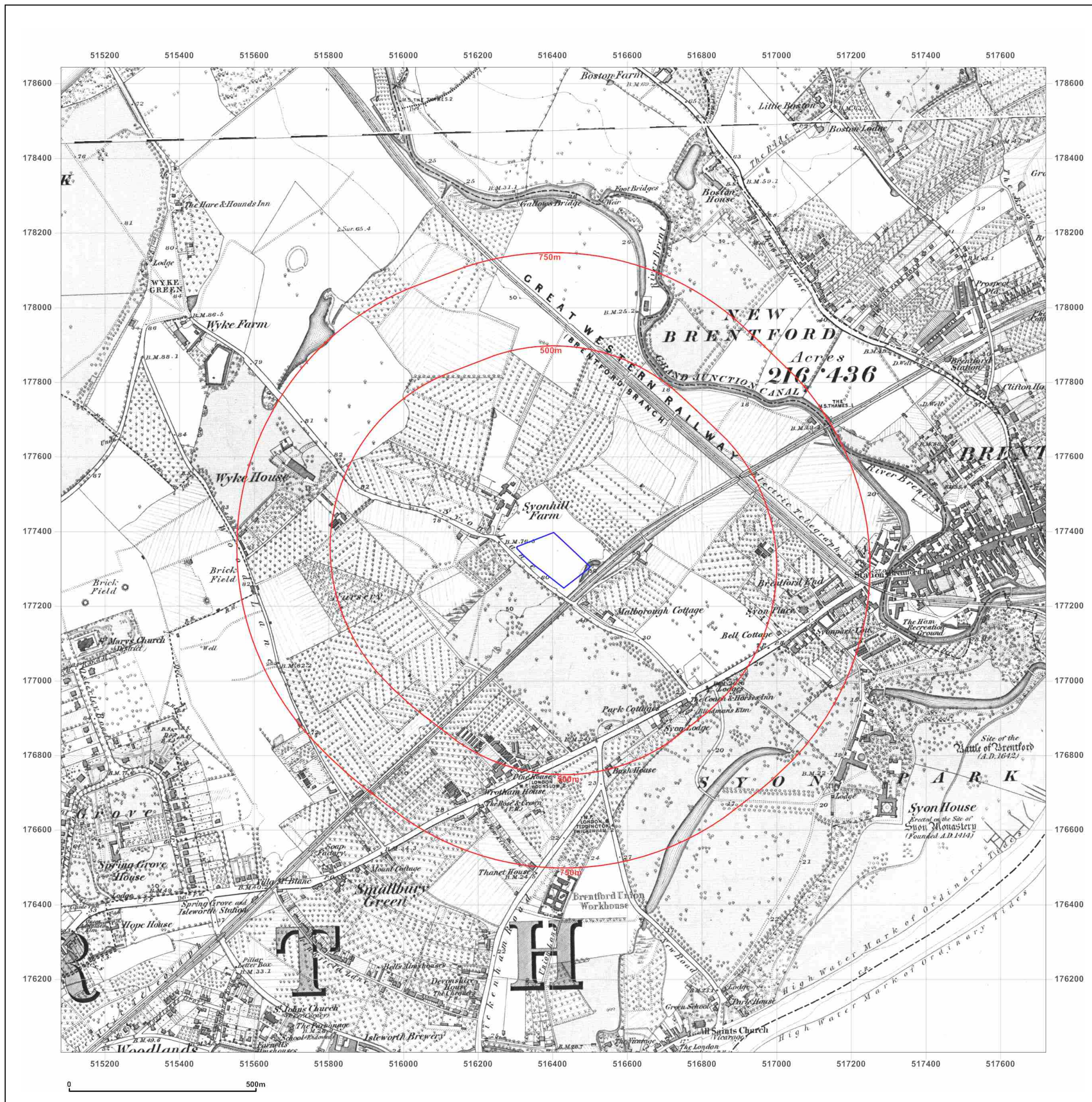
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

Map date: 1894

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1894
Revised 1894
Edition N/A
Copyright N/A
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Surveyed 1865
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A



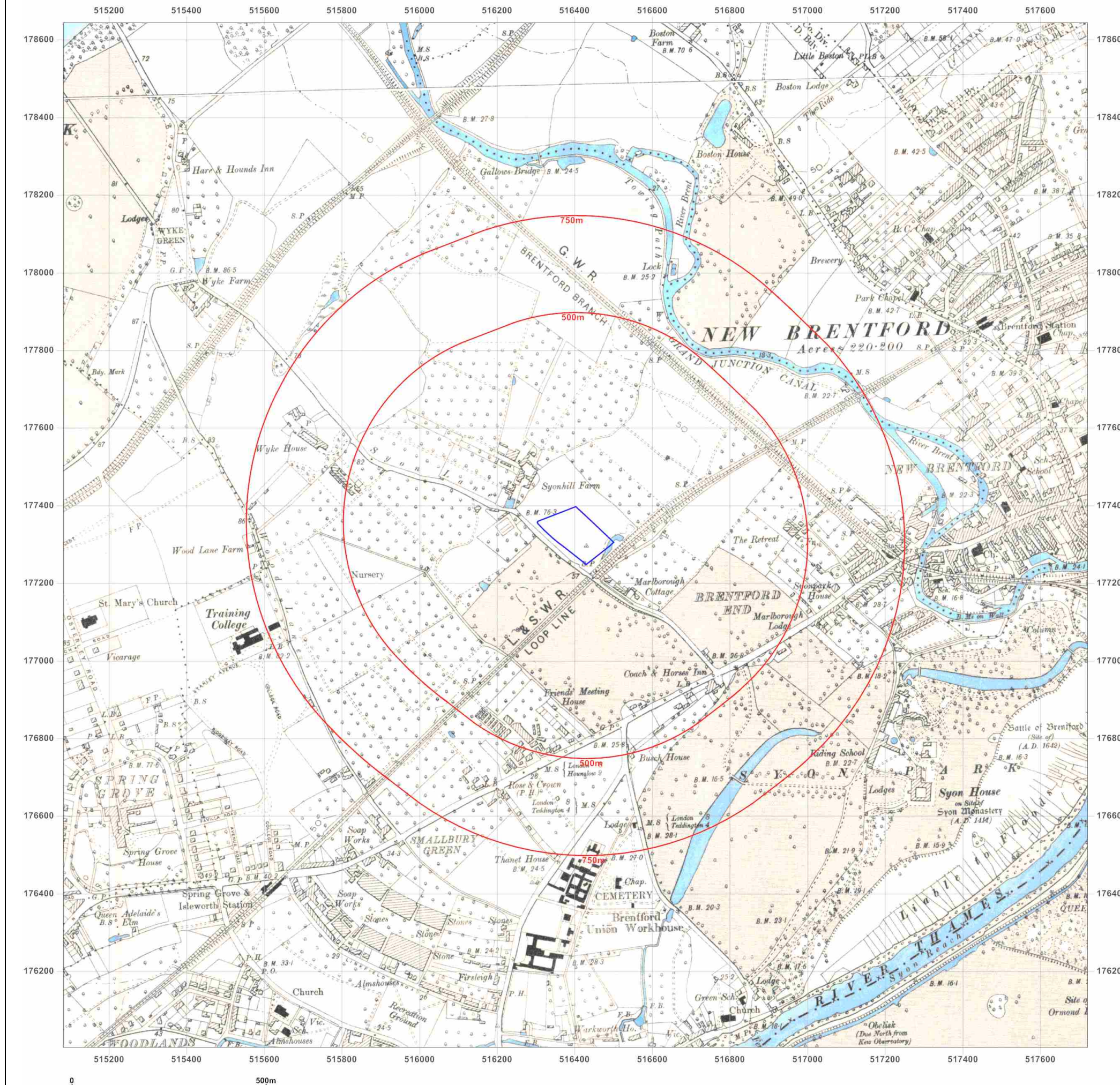
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

Map date: 1894

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1866
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A



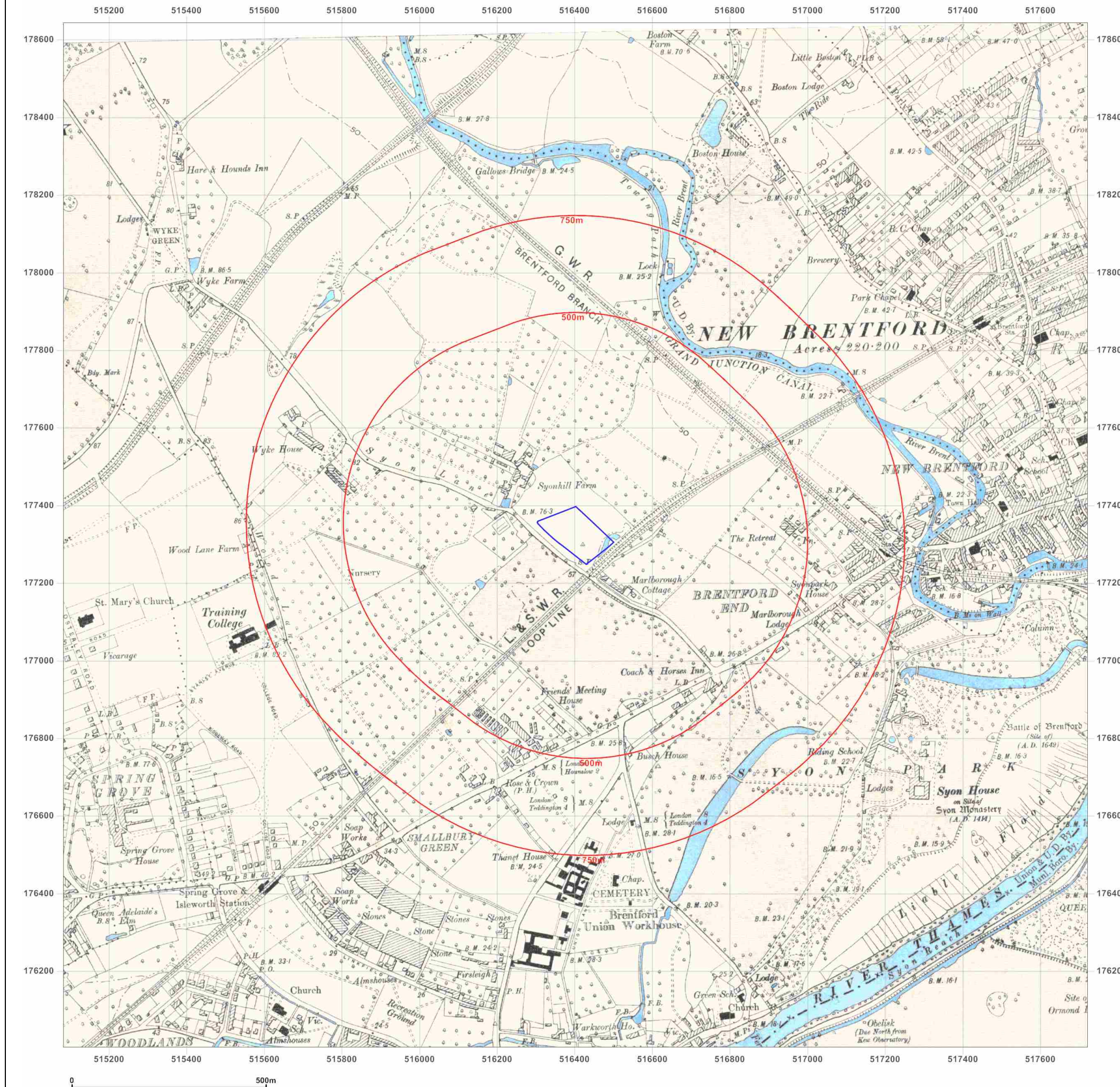
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

Map date: 1896

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1864
Revised 1896
Edition 1896
Copyright N/A
Levelled N/A

Surveyed 1865
Revised 1896
Edition 1896
Copyright N/A
Levelled N/A



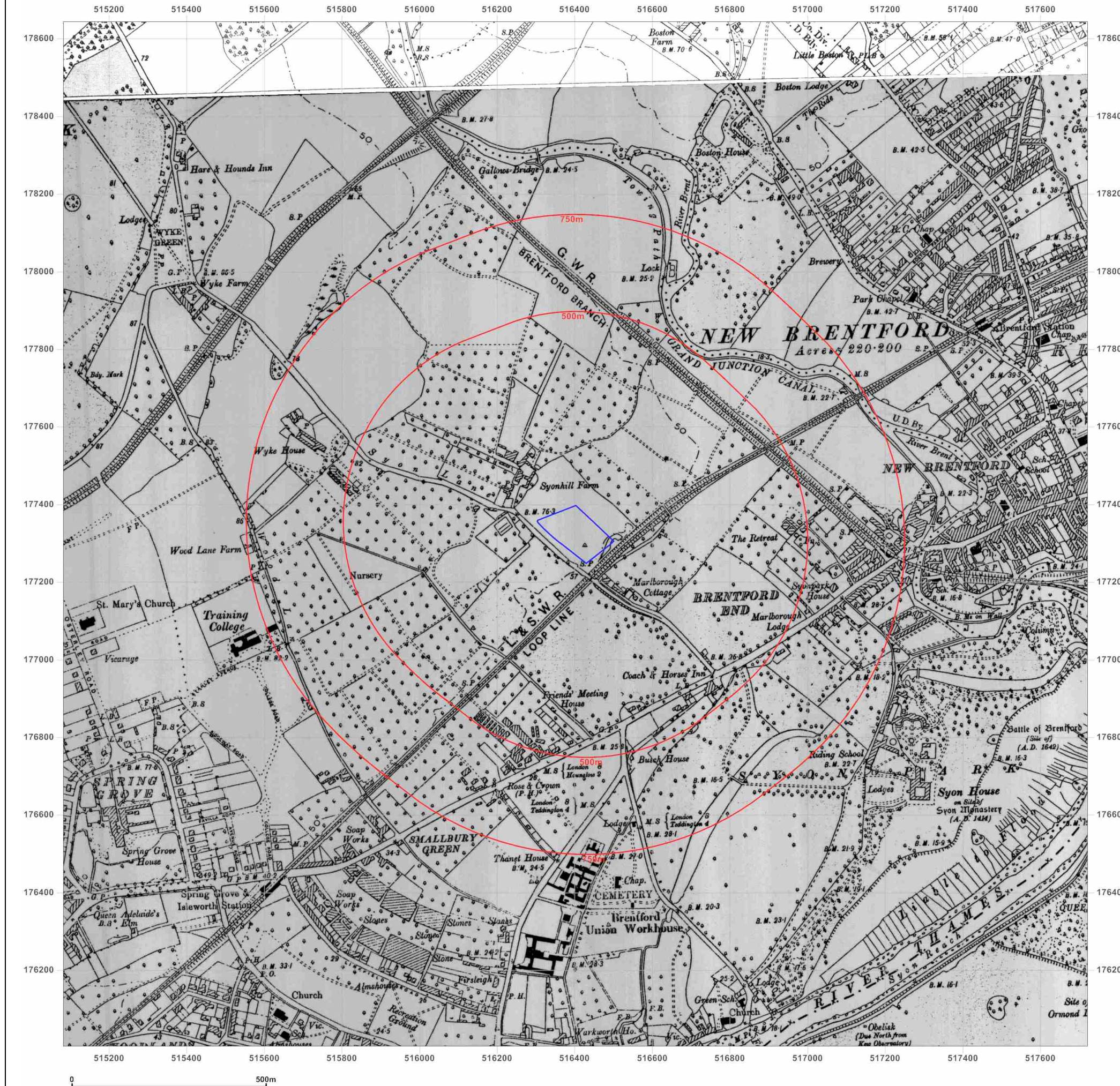
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

Map date: 1898

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1866
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A



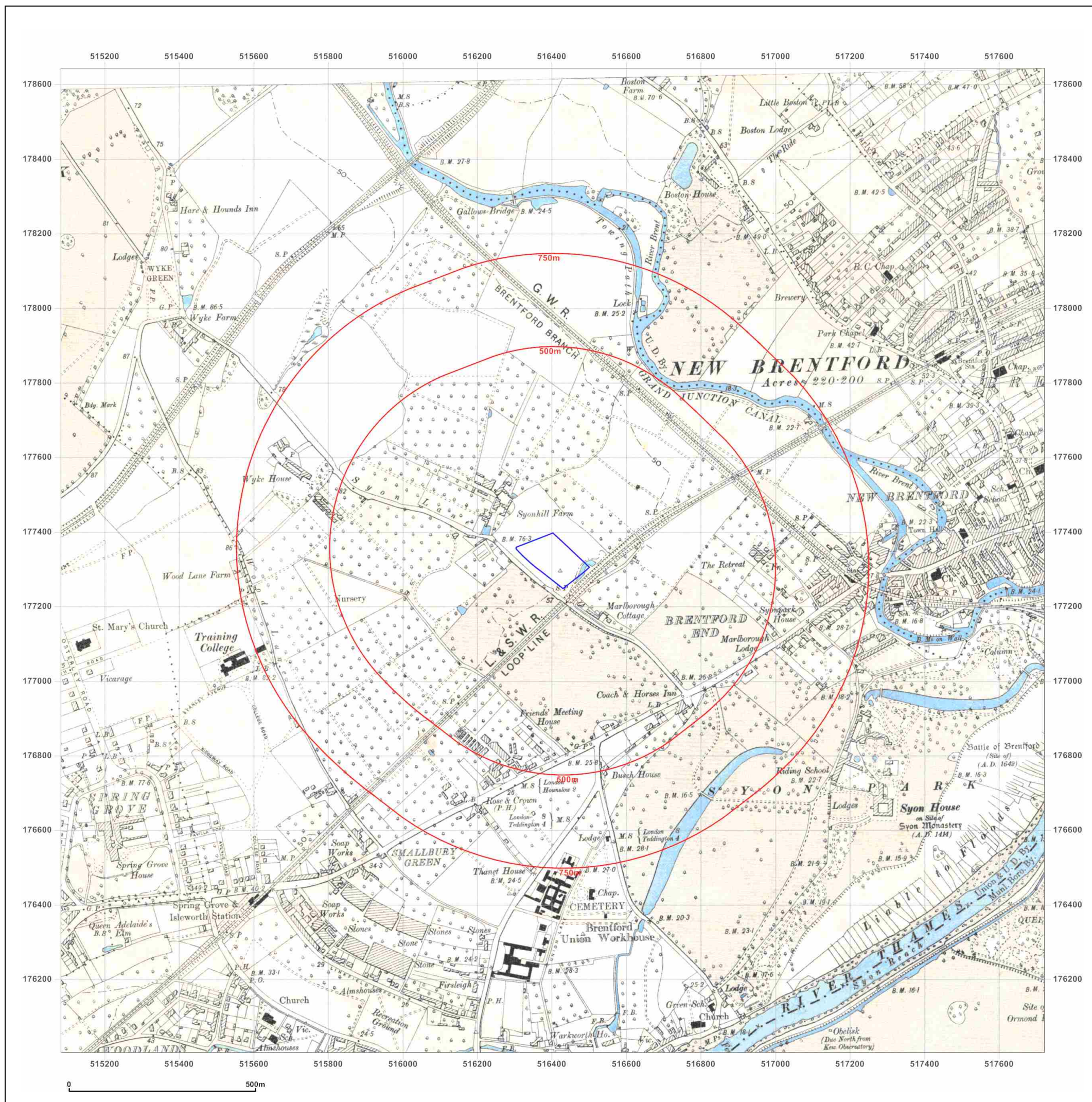
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

Map date: 1912

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1866
Revised 1912
Edition N/A
Copyright N/A
Levelled N/A



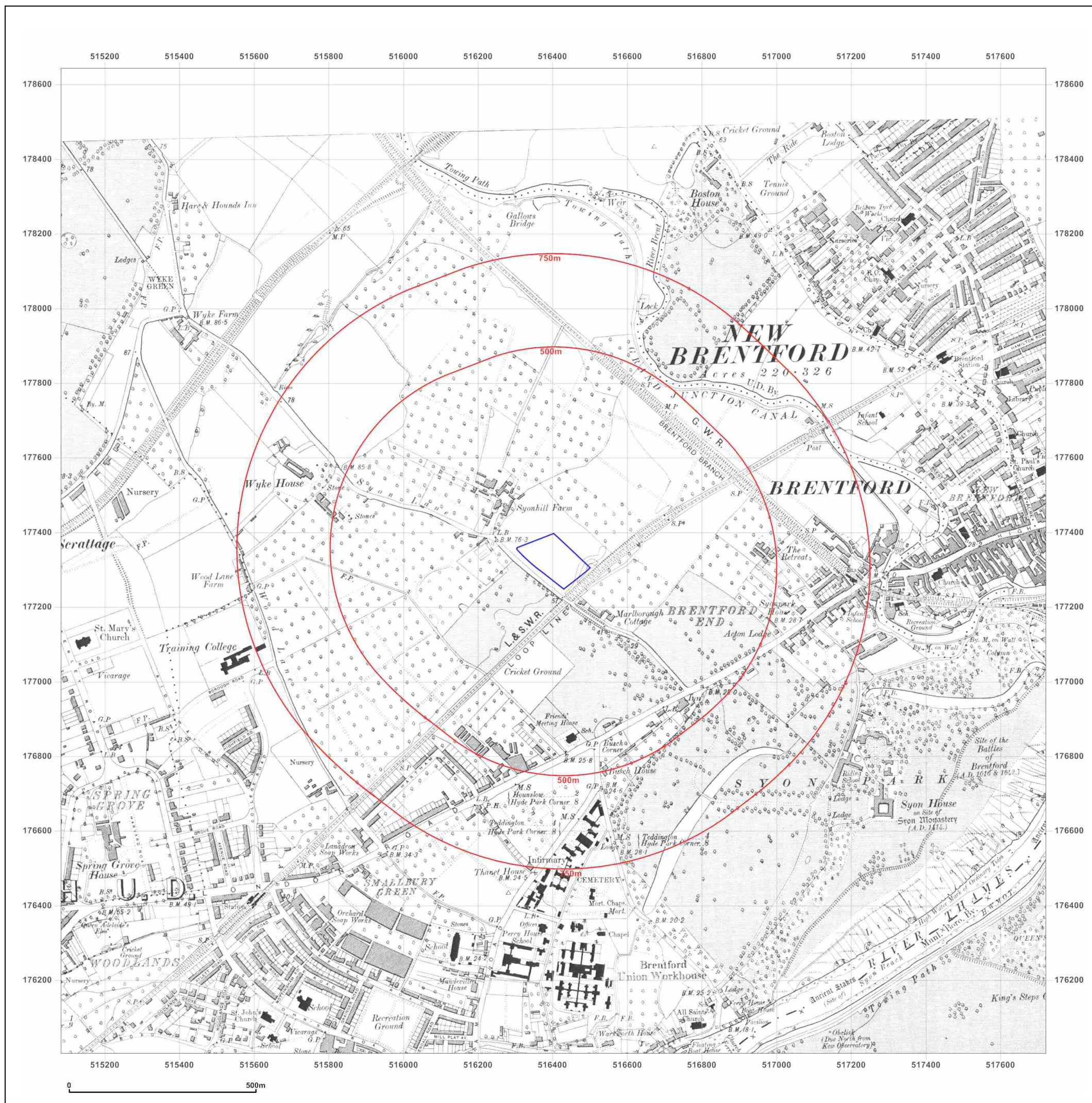
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

Map date: 1920

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1866
Revised 1911
Edition 1920
Copyright N/A
Levelled 1911



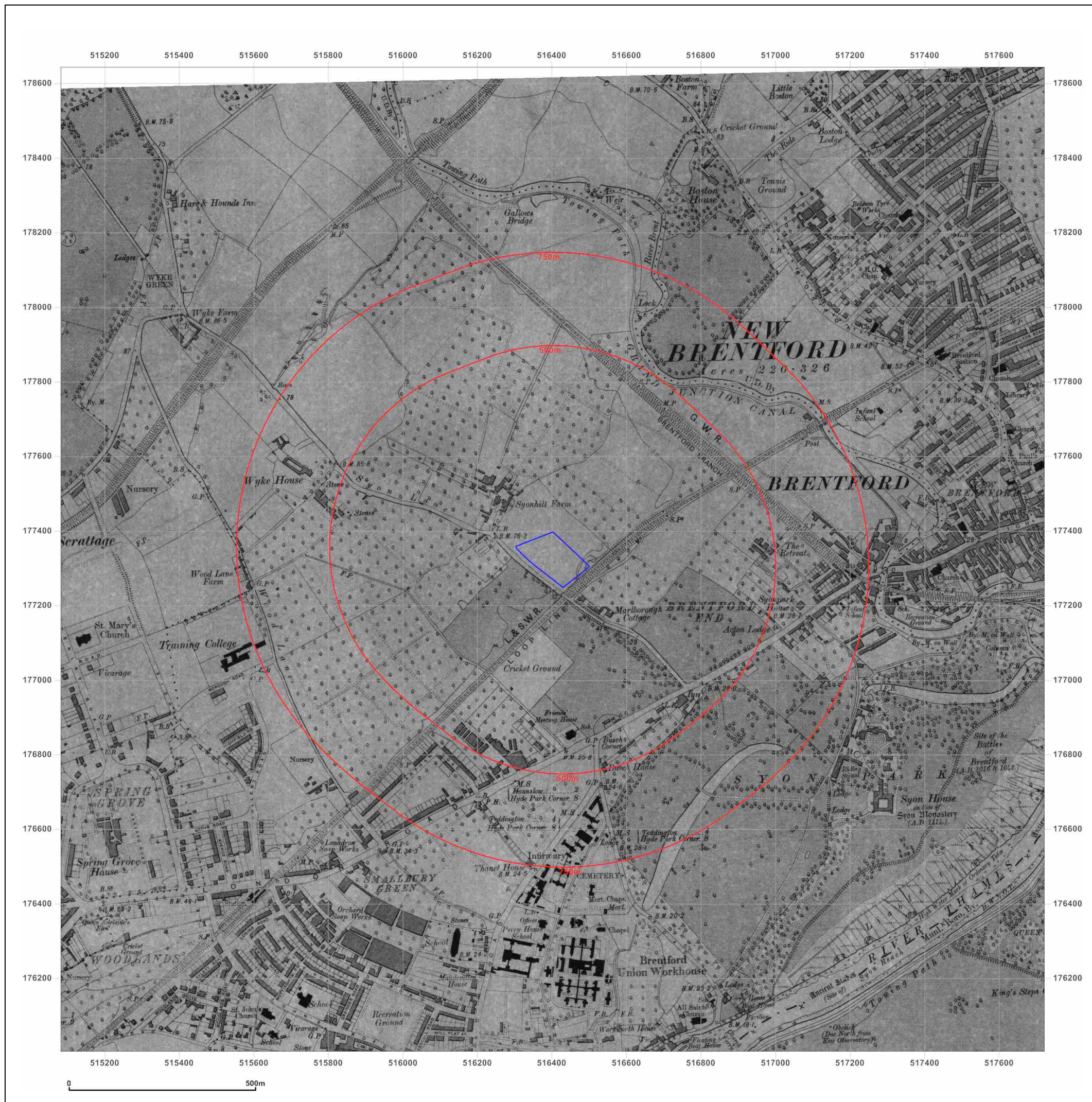
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

Map date: 1933-1934

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1864
Revised 1934
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1866
Revised 1933
Edition N/A
Copyright N/A
Levelled N/A



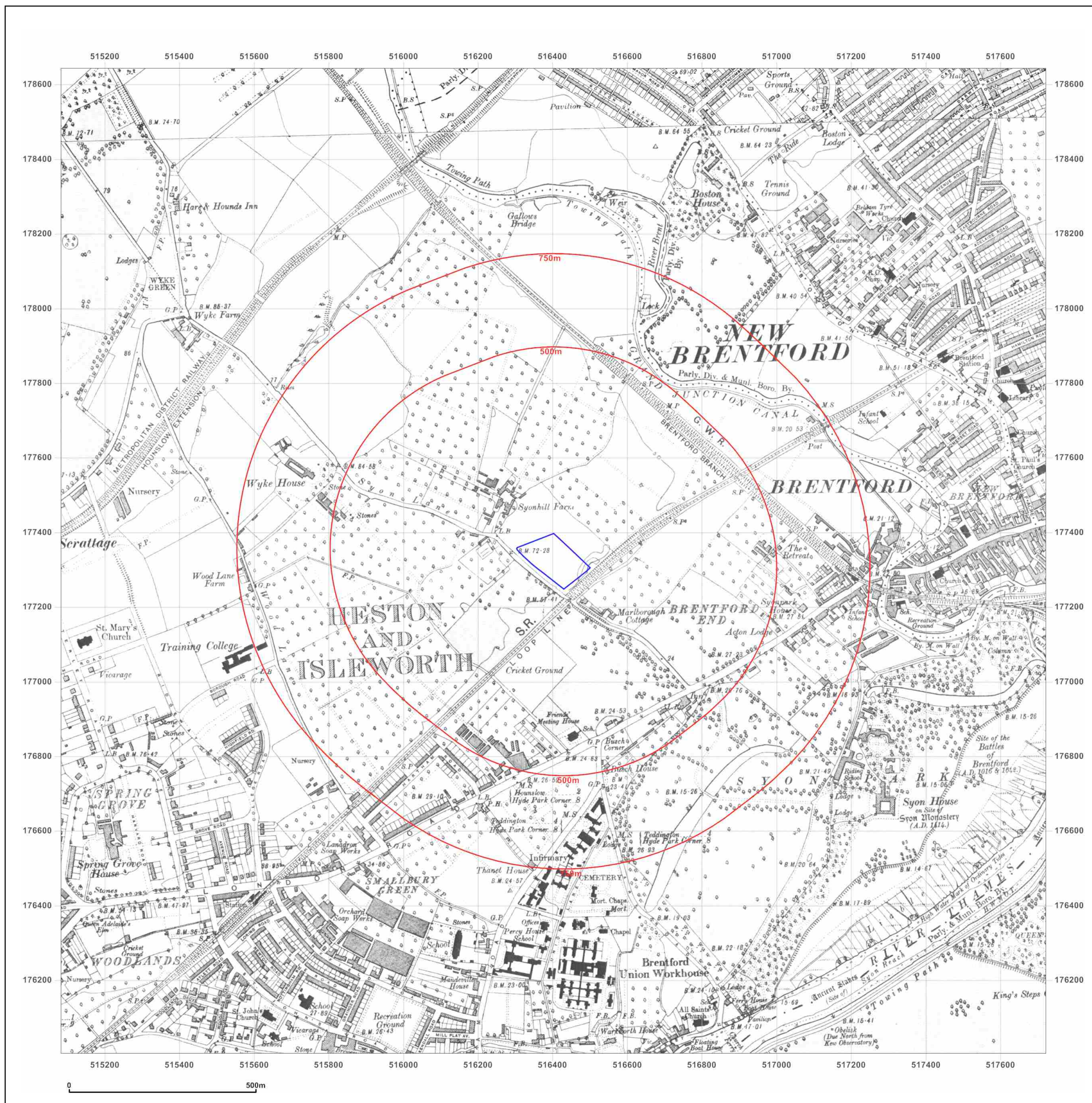
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: County Series

Map date: 1935-1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1864
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1866
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A



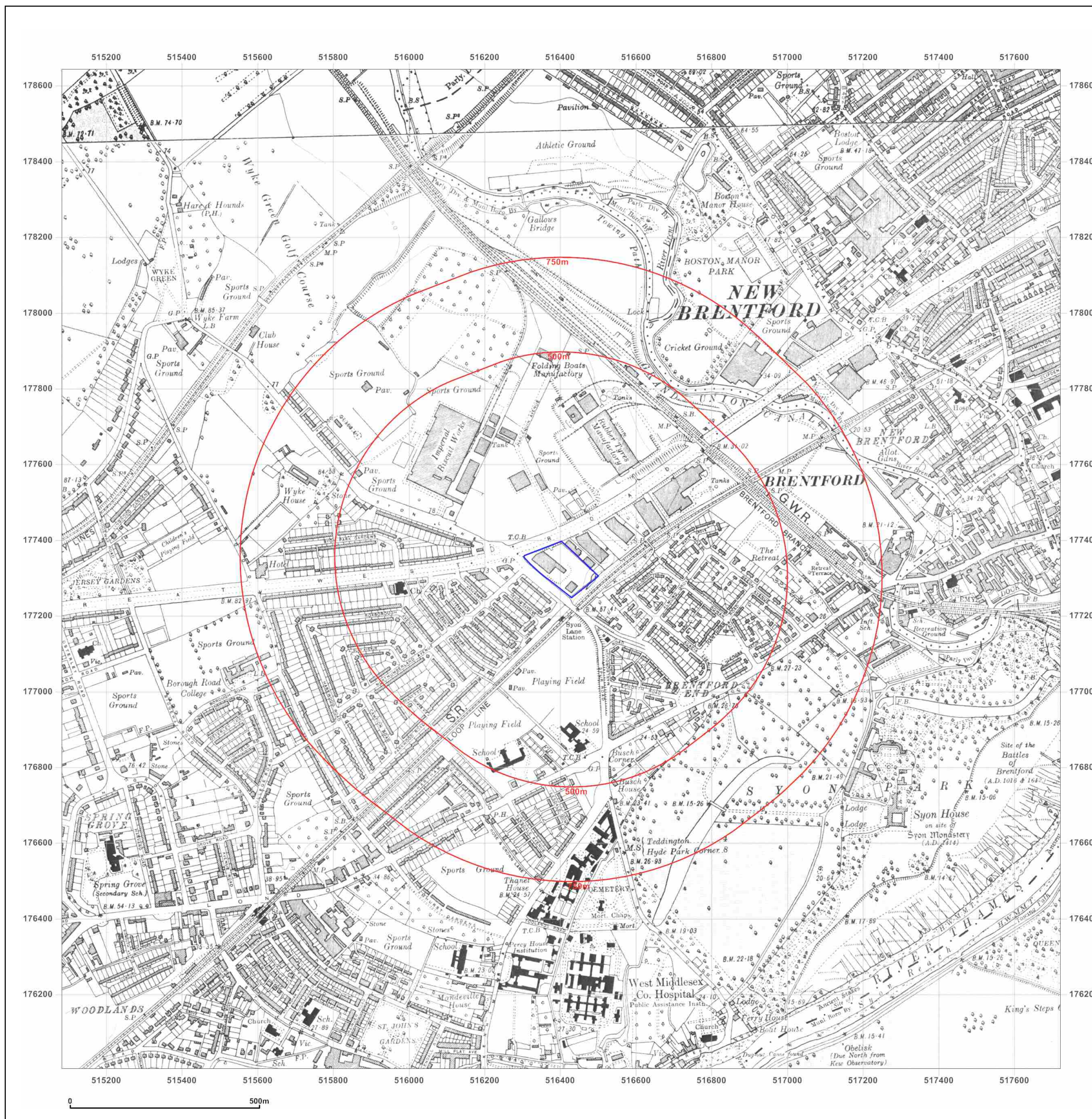
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: Provisional

Map date: 1948

Scale: 1:10,560

Printed at: 1:10,560



Surveyed N/A
Revised 1948
Edition N/A
Copyright N/A
Levelled 1934



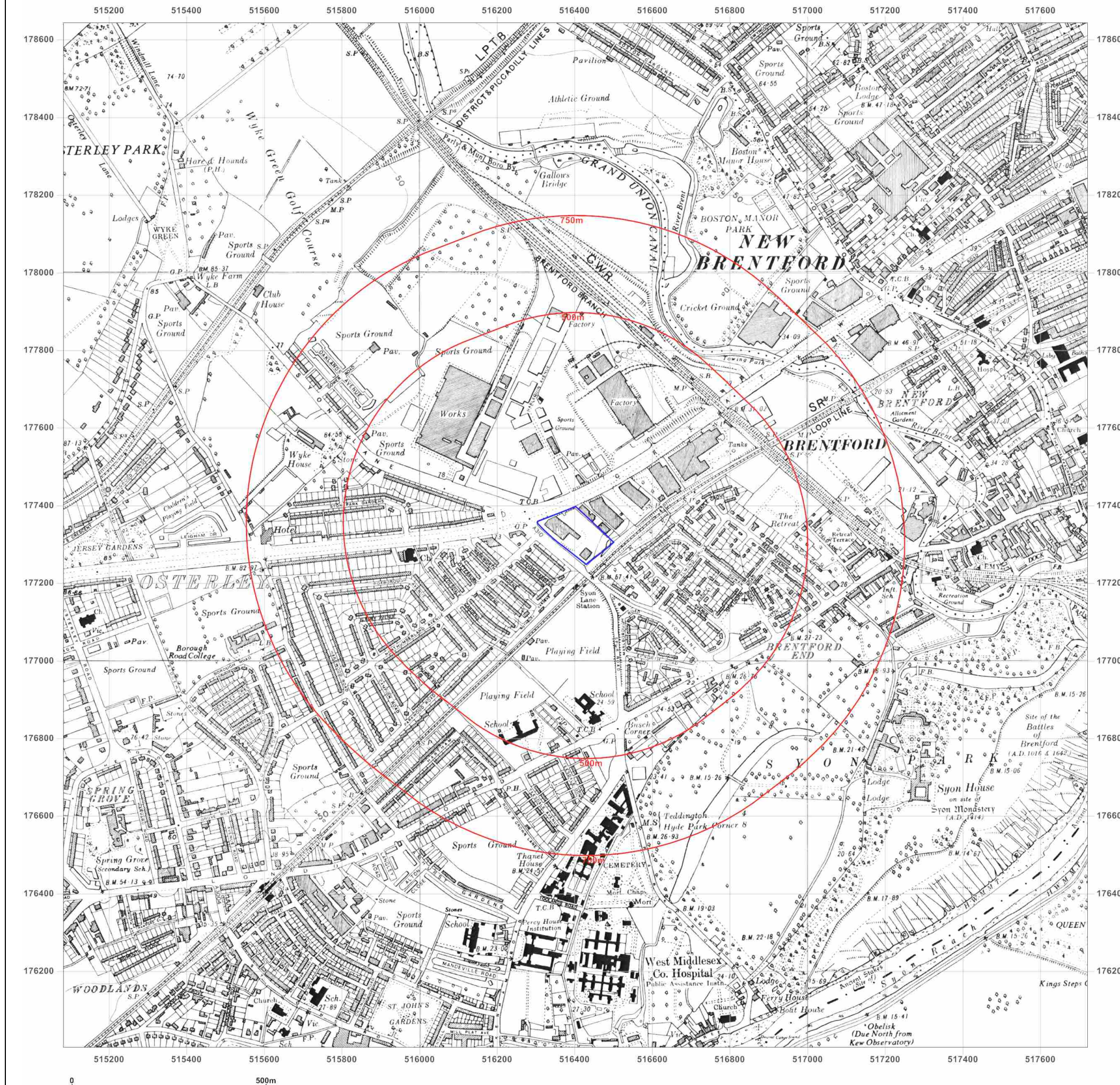
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Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: Provisional

Map date: 1961

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1940
Revised 1961
Edition N/A
Copyright N/A
Levelled N/A



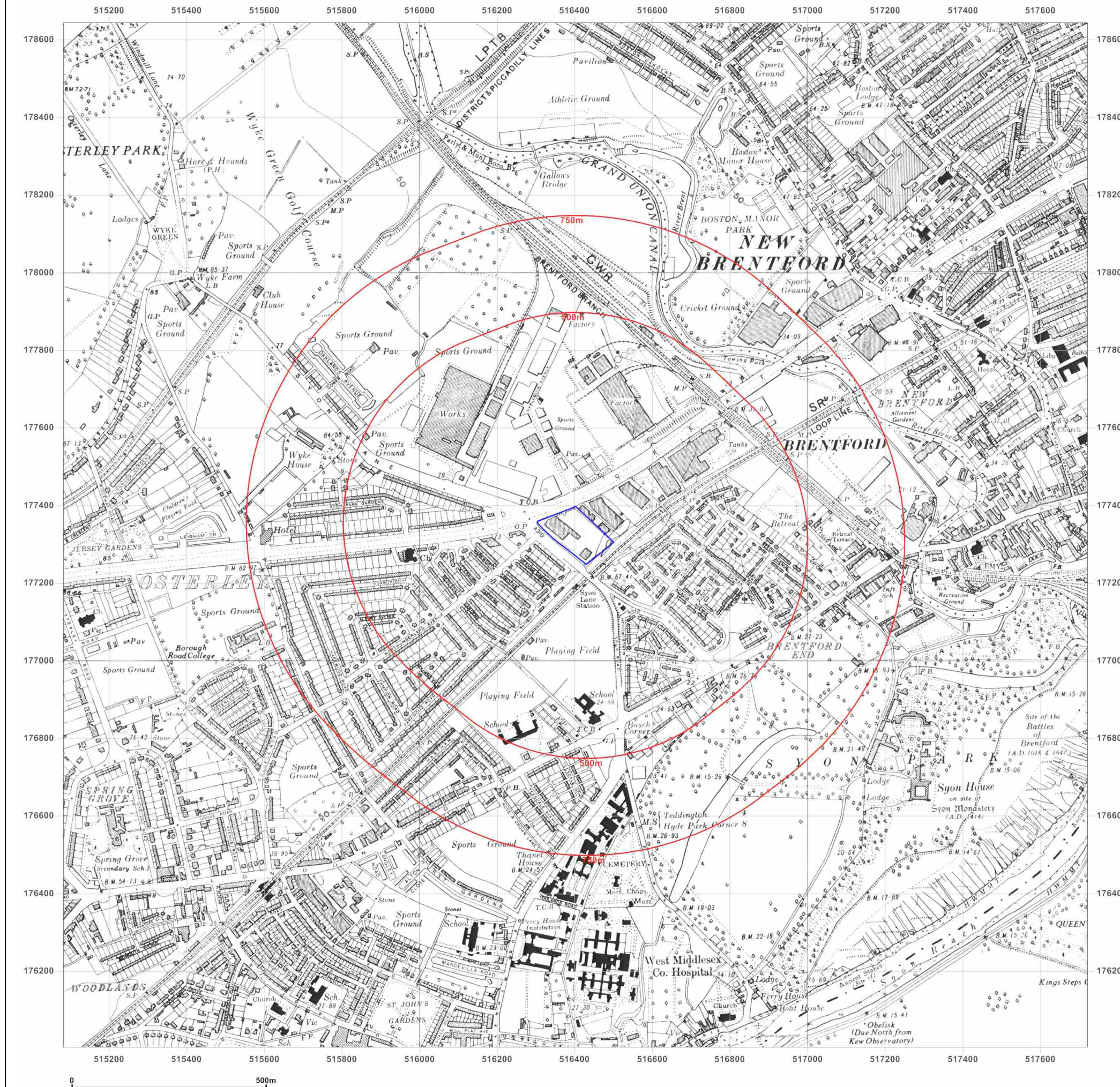
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: Provisional

Map date: 1966

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1966
Revised 1966
Edition N/A
Copyright N/A
Levelled N/A



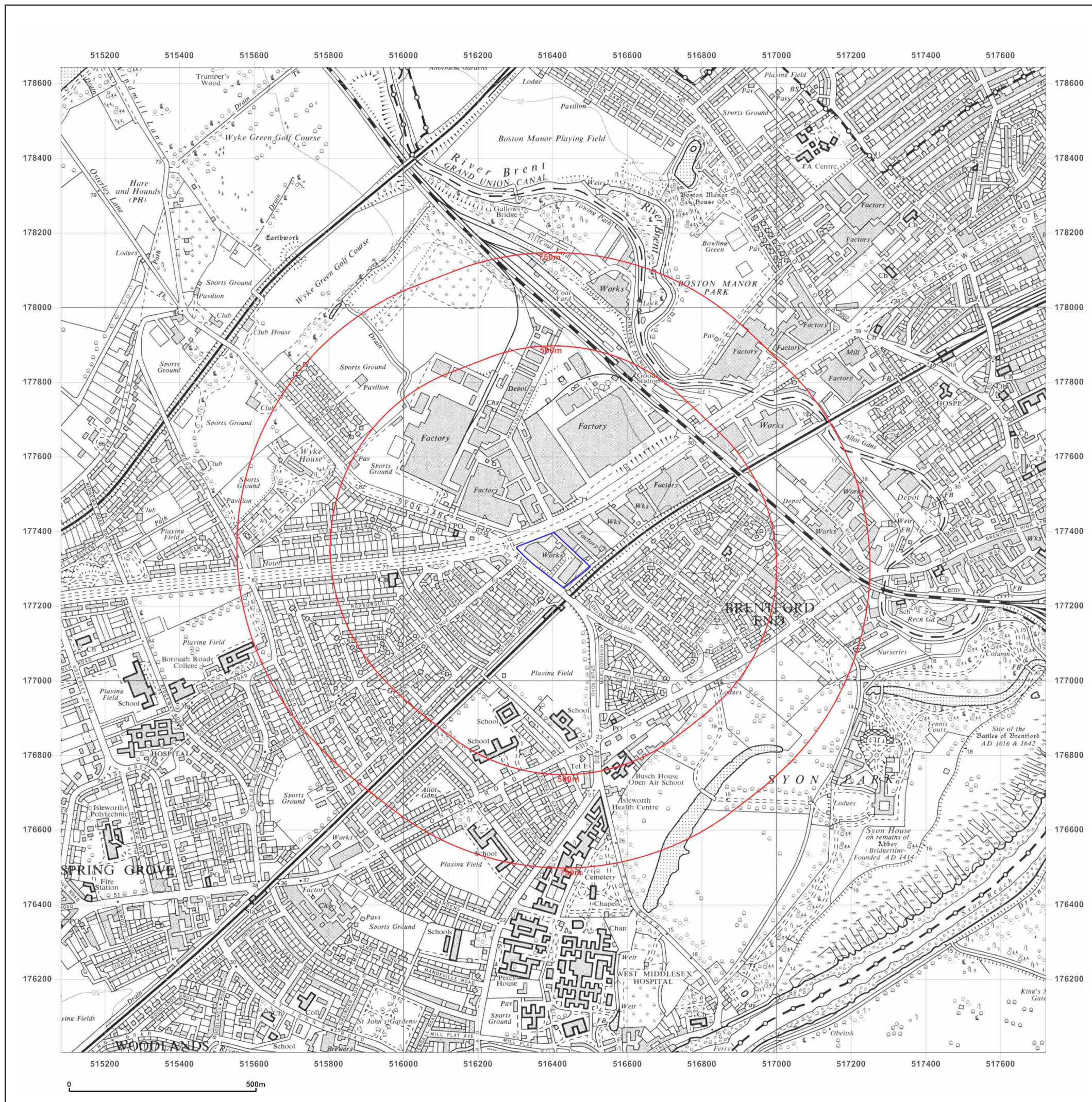
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: National Grid

Map date: 1974

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: National Grid

Map date: 1987

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1982
Revised 1987
Edition N/A
Copyright N/A
Levelled N/A



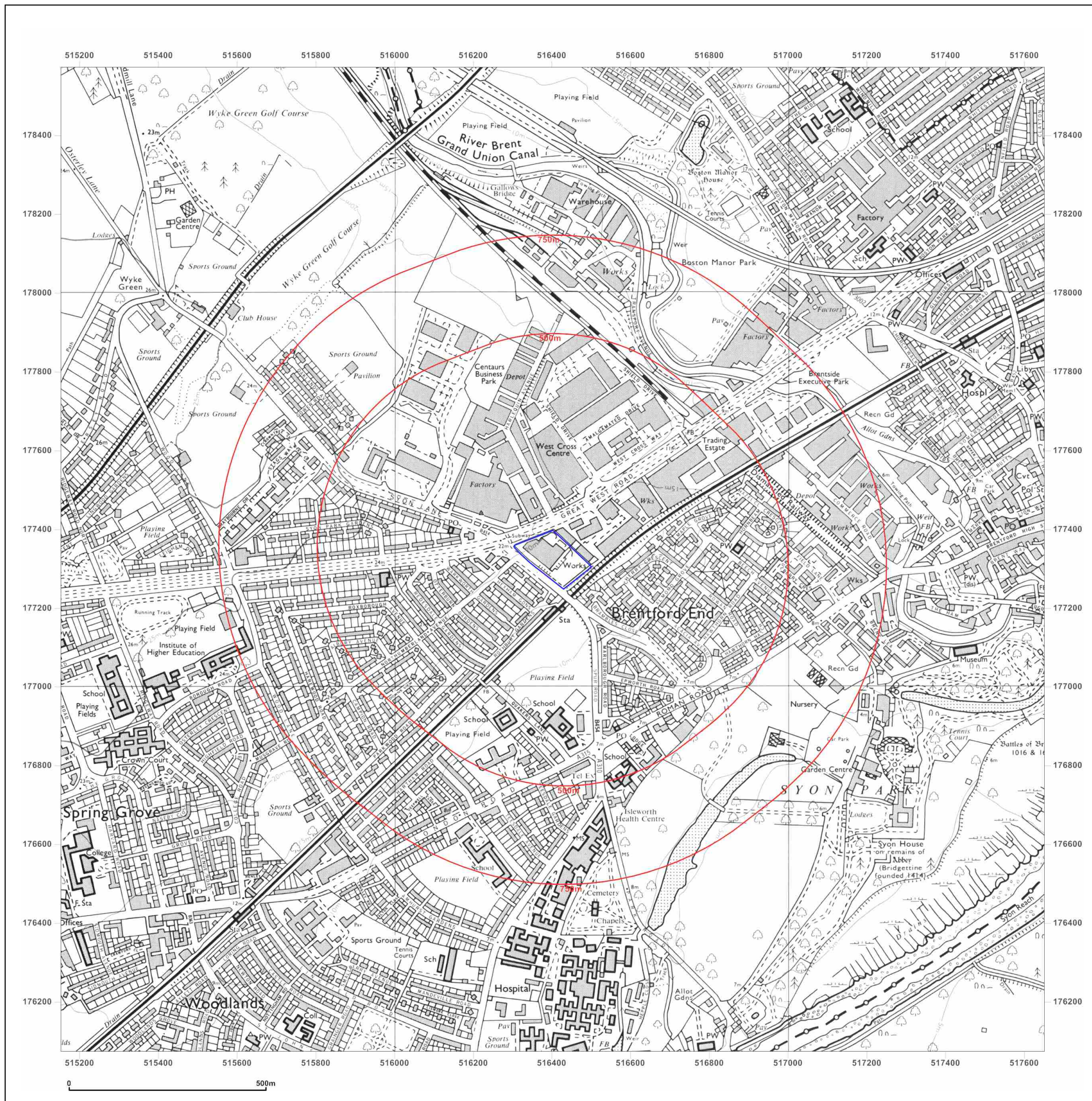
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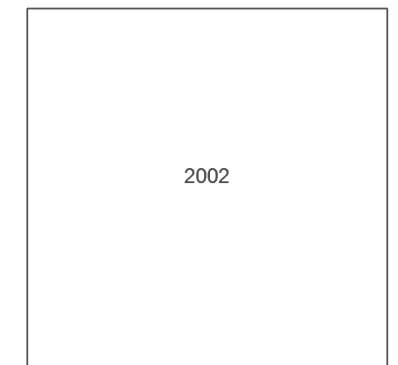
Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



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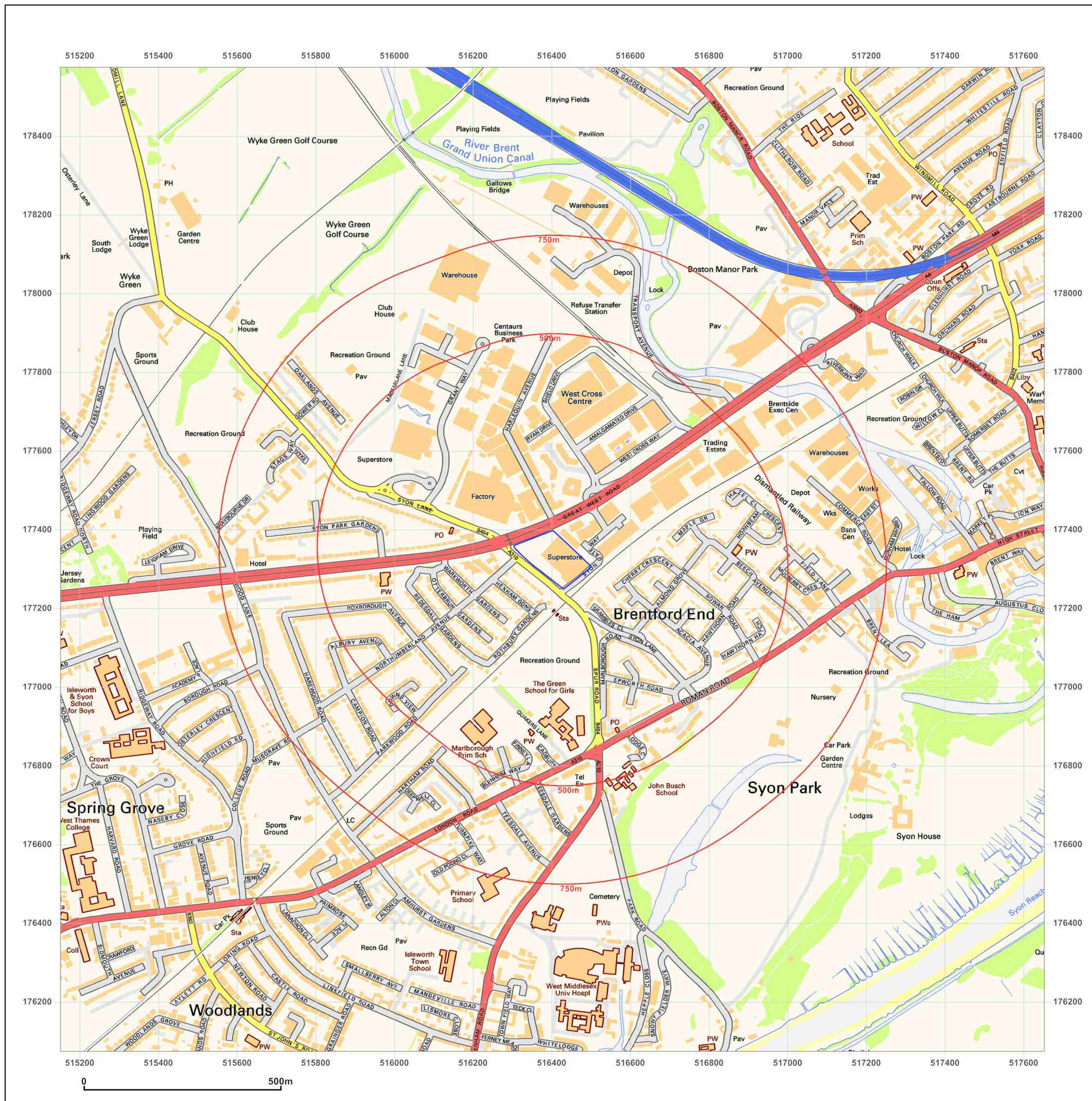
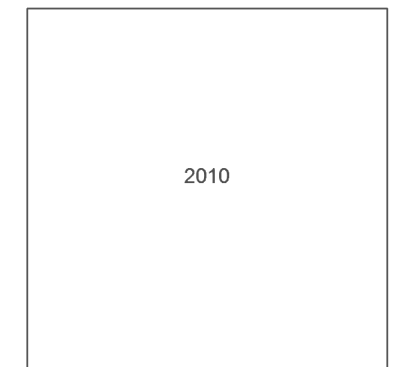
Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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Client Ref: 93632
Report Ref: WTM1-5522779
Grid Ref: 516401, 177323

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



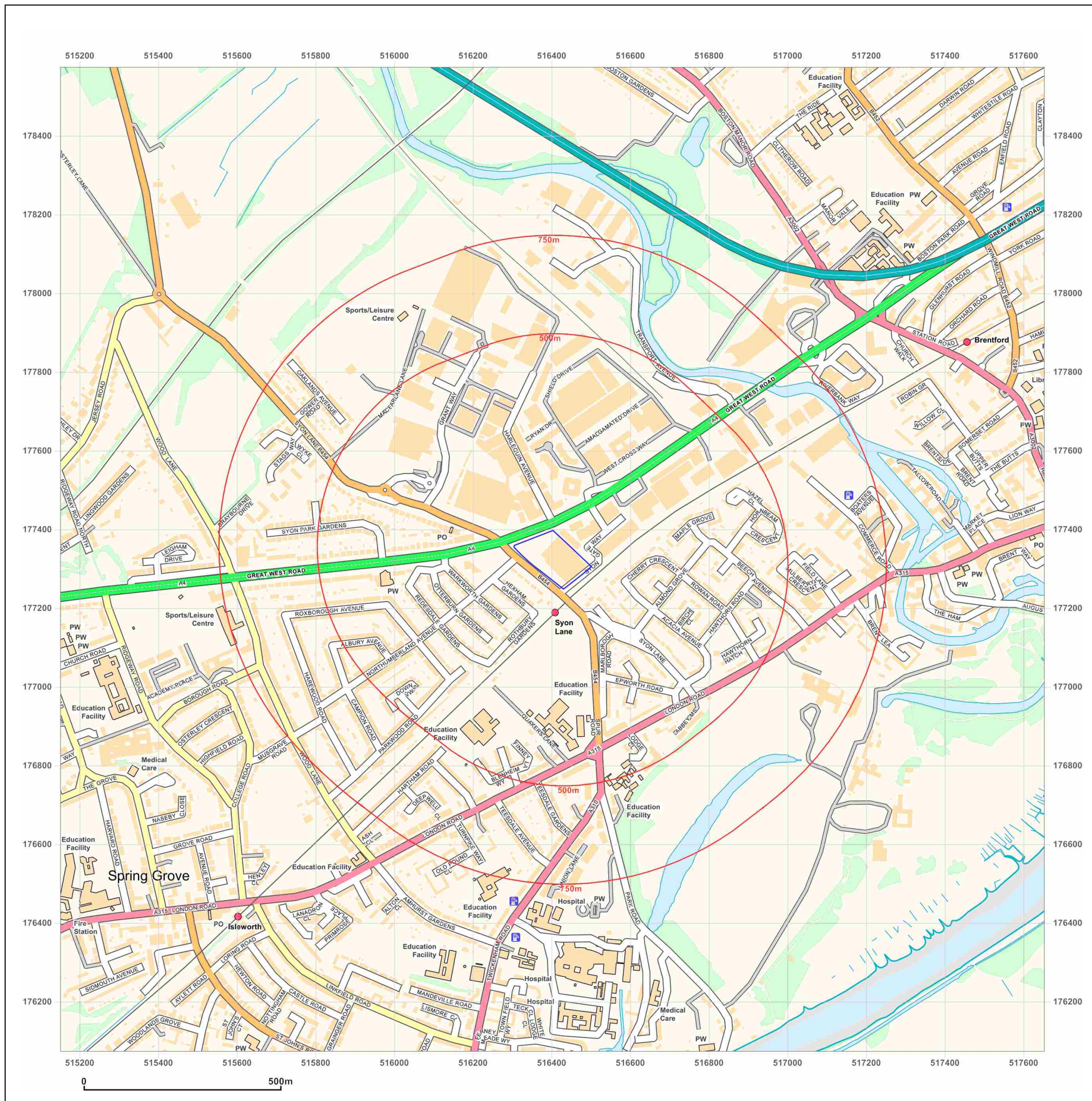
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Jon Coates
Waterman I & E
Pickfords Wharf
Clink Street
London
SE1 9DG

The London Fire Commissioner is the
fire and rescue authority for London

Date 9 August 2019
Our Ref 25/006631
Your Ref WIE 15238

Dear Sir

THE ENVIRONMENTAL INFORMATION REGULATIONS 2004 - ENVIRONMENTAL ENQUIRY

Premises: Homebase, 67 Syon Lane, Brentford, Isleworth TW7 5QE

The London Fire Commissioner (the Commissioner) is the fire and rescue authority for London. The Commissioner is responsible for enforcing the Petroleum (Consolidation) Regulations 2014 in London.

As requested, a petroleum environmental search has been made in respect of the above premises.

A thorough search of current and historical files and databases has revealed information for the site as detailed in the attached forms.

Please note that this report is restricted to matters currently known by the Commissioner. Although we hold extremely comprehensive records, it is possible that we do not hold any records whatsoever for some solid-filled and very old tanks. This will be for one of the following reasons:-

1. The records held by the Commissioner were passed to it from the Greater London Council in 1986. In 1965 the Greater London Council inherited petroleum related records from the London County Council and the outer London Boroughs / Councils. Some of the outer London records were incomplete.
2. For premises where petroleum tanks have been either removed or permanently made safe, the Commissioner's records have (in a minority of cases) been destroyed; and for these cases the Commissioner does not hold any records that indicate that there was ever a 'petroleum' interest at the premises.

As you are aware, a fee is levied for the provision of this information and payment should be made in accordance with the invoice, which will be sent under separate cover.

Any queries regarding this letter should be addressed to the person named below. If you are dissatisfied in any way with the response given, please ask to speak to the Head of Petroleum quoting our reference.

Yours faithfully,



for Assistant Commissioner (Fire Safety)

Directorate of Operations

petroleum@london-fire.gov.uk

Reply to Richard Nye

Direct T 0208 555 1200 x 30808

ENVIRONMENTAL ENQUIRY DETAIL FORM

Premises:
Homebase, 67 Syon Lane, Brentford, Isleworth TW7 5QE
Our Reference:
25/006631

Tank No.	Compartment No.	Year	Tank Type	Tank Capacity (litres)	Fuel Type	Current Status
1	1	Not known	Not known	4,750	Petrol	Water filled

Current licence/Petroleum Storage Certificate in force?
YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
Date last licence(s)/storage certificate(s) issued:
Licensed for the period 01/05/1988 to 30/04/1997

Known leaks or spills at this site:
There are no records of any leaks or spills at this site.

Comments:
<ol style="list-style-type: none"> 1. The records for this site are minimal and there are no plans available to show the location of the tank referred to above. 2. A record indicates that the tank was water filled but there is no date given for when this was done. 3. There is no record to confirm that the tank was ever solid filled or removed from the site.

Signed:

R Nye

Name:

Richard Nye

Position:

Policy Support Manager

Date:

9 August 2019

Housing, Planning and Communities

Land Quality Team

**London Borough of Hounslow,
Hounslow House, 7 Bath Road, TW3 3EB**

Jon Coates

Waterman I&E
Pickfords Wharf
Clink Street
SE1 9DG

Your contact is: Land Quality Team
Direct Line: 020 8583 6794/ 5062
Fax: 020 8583 5350
E-Mail: landquality@hounslow.gov.uk
Our ref: **EIR1253**
Your ref: **WIE15238**
Date: 31 July 2019

Dear Jon Coates,

RE: ENVIRONMENTAL INFORMATION SEARCH

Homebase, 67 Syon Lane, Isleworth, TW7 5QE,

Thank you for your recent request for environmental information. The attached report is a complete search of our digital database for any records held on or within 250 metres of the site named above. This information includes:

- Industrial history from 8 epochs of maps and land use surveys, ranging from 1865 to 1971.
- Details from our public register of known former landfill sites.
- Details from our public register of Contaminated Land.
- A list of publicly accessible site reports held at the Civic Centre.

Our data collection is ongoing so there may be some cases where we currently hold little or no information about a site.

The information provided has been obtained from records held by the Council, which includes records based on information provided to the Council. The information is believed to be correct but no responsibility is accepted for the accuracy of the information provided. Some information has been extracted from historical maps and the accuracy of the boundaries cannot be assured.

Our charge for providing this information is £136.00 This charge covers our standard search fee and VAT. We understand that you paid this charge when you requested the report.

We trust the enclosed information satisfies your request.

Yours sincerely

Ann Zhang

On behalf of the Land Quality Team
London Borough of Hounslow

Report checked by: ...A. Devine.....

Date:31/07/19.....

Additional Sources of Information
PLEASE READ.

London Borough of Hounslow Pollution Control Team

The Pollution Control Team of the London Borough of Hounslow holds the following information:

- Details of Part B prescribed processes
- Nuisance issues (including noise, odour and dust problems/complaints)

Any requests for information of this nature have been forwarded to the Pollution Control Team. A member of the team will address your questions and respond to you directly. If you would like to contact an officer directly, please do so using the following:

London Borough of Hounslow Pollution Control Team Tel: 020 8583 2000
Hounslow House, 7 Bath Road, Email: pollution@hounslow.gov.uk
Hounslow, TW3 3EB

London Borough of Hounslow Development Control Team

The London Borough of Hounslow's Development Control Team maintain records for sites in the borough developed under the Town and Country Planning Act 1990. Any requests for information of this nature have been forwarded to the Development Control Team; a member of that team will address your questions and respond to you directly. If you would like to contact the Development Control Team, please do so using the following:

London Borough of Hounslow Tel: 020 8583 2000
Development Control Team Email: planningcomments@hounslow.gov.uk
Hounslow House, 7 Bath Road,
Hounslow, TW3 3EB

London Borough of Hounslow Building Control Department

The Building Control Department maintain records for sites inspected under the Building Regulations 2000 (as amended). Any requests for information of this nature have been forwarded to the Building Control Department. A member of the team will address your questions and respond to you directly. If you would like to contact an officer directly, please do so using the following:

London Borough of Hounslow Tel: 020 8583 2000
Building Control Department Email: buildingcontrol@hounslow.gov.uk
Hounslow House, 7 Bath Road,
Hounslow, TW3 3EB

Environment Agency Information

The following information is held by the Environment Agency:

- Pollution Incidents and related prosecutions
- Groundwater Abstractions
- Surface Water Courses

Requests for this information should be directed to the Environment Agency as the appropriate authority for this information. They can be contacted using the following:

External Relations Team
Apollo Court
2 Bishop's Square Business Park
St Albans Road West
Hatfield
Herts. AL10 9EX

Tel: 0370 8506 506

British Geological Survey

The British Geological Survey maintain geological records for the United Kingdom and can provide services and advise on many aspects of geoscience. Some of their services include:

- Information on natural ground stability
- Geology Maps
- Information Radon protective measures
- Geological Assessments

They can be contacted using the following:

British Geological Survey
Keyworth
Nottingham
NG12 5GG

Tel: 0115 936 3143
Fax: 0115 936 3276
Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk

Radon Enquiries

All enquiries regarding radon should be directed to the Health Protection Agency (Centre for Radiation, Chemical and Environmental Hazards). They can be contacted using the following:

Public Health England
Radiation Protection Division
Chiltern
Didcott
Oxon OX11 0RQ

Tel: 01235 831 600
Fax: 01235 833 891

Archaeological Issues

All enquiries regarding archaeological issues should be directed to English Heritage. They can be contacted using the following

English Heritage
Customer Services Department
PO Box 569
Swindon SN2 2YP

Tel: 0870 333 1181
customers@english-heritage.org.uk

GIS SEARCH

DATE: 30 July 2019 TIME: 12:47

Site Coordinates (British National Grid): 516401, 177323

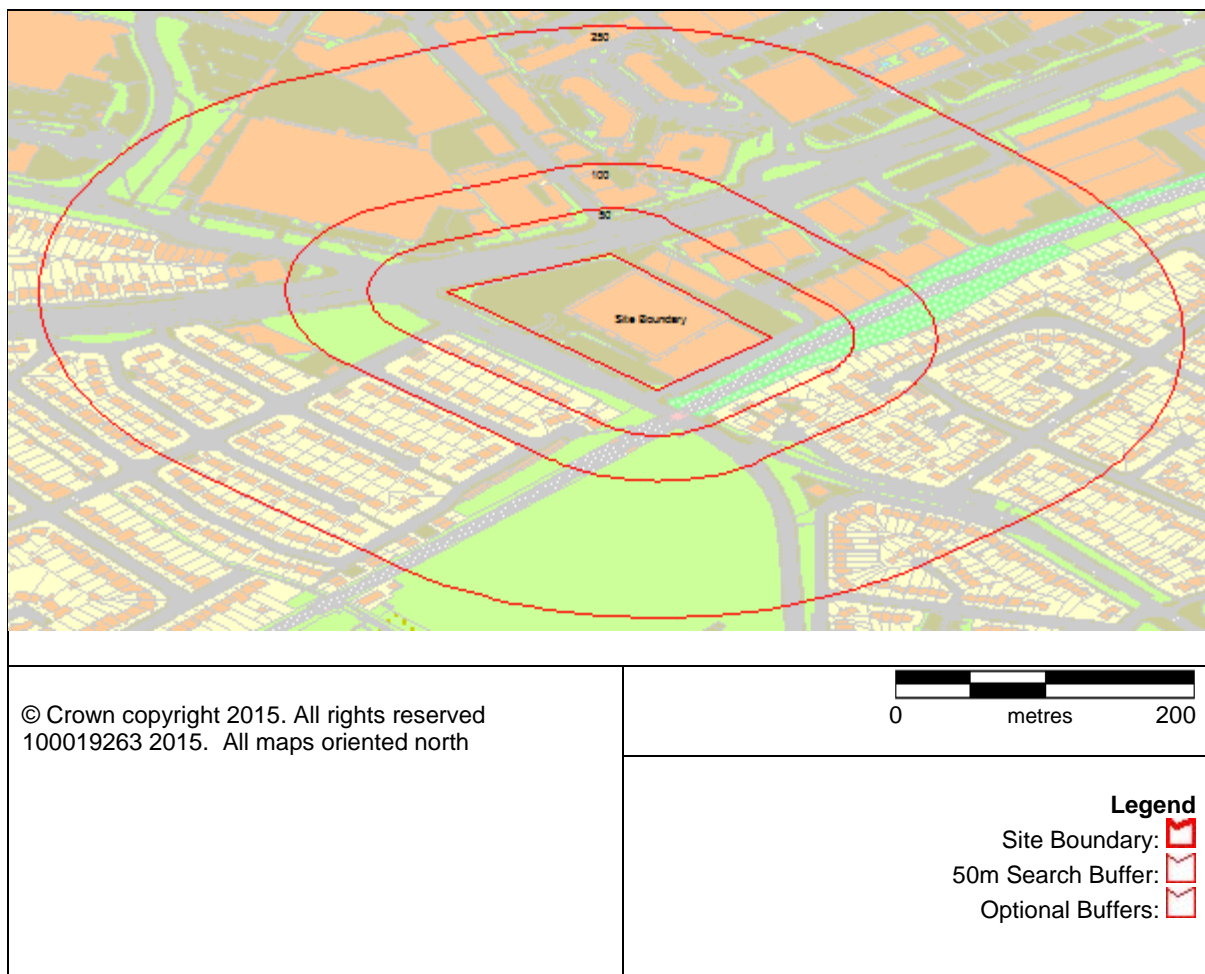
Site Area: 14170.00 sq.metres

Buffer Search Type: Polygon buffer search

Buffer Search Radius: 50 and 250 metres

Selection Summary: A total of 314 features were selected on 10 out of 13 target layers.

Site Overview Map



Statutory Contaminated Land

To date, the London Borough of Hounslow has not been required to determine any land within its administrative boundary as Contaminated Land as defined under Part 2A of the Environmental Protection Act 1990.

Status under Part 2A of the Environmental Protection Act 1990

We are currently reviewing information across the borough in accordance with our published Contaminated Land Strategy (which can be viewed at www.hounslow.gov.uk). The site named above is likely to undergo some form of further investigation due to its historic industrial use. We are not currently able to confirm what form these investigations may take, but please note that this does not necessarily imply intrusive site works.



Former landfill sites

Hounslow Council has undertaken substantial work in the past to identify closed landfill sites. In the early 1990s a Landfill Public Register was produced by the then Landfill Team. The register is supported by supplementary information collected from historical land use surveys and intrusive investigations. Wherever available, our latest monitoring data and summaries of any remedial works are included. Our public register documents former landfill sites that are no longer in operation; there are no licensed landfill sites operating in the borough at the present time.

No records were selected on this layer.

Industrial History

As part of our statutory duties in relation to Part 2A of the Environmental Protection Act 1990, we have conducted a detailed review of historical maps and land use surveys. This research has identified former industrial land uses on, and adjacent to the site that have the potential to cause contamination. These former uses are summarised below:

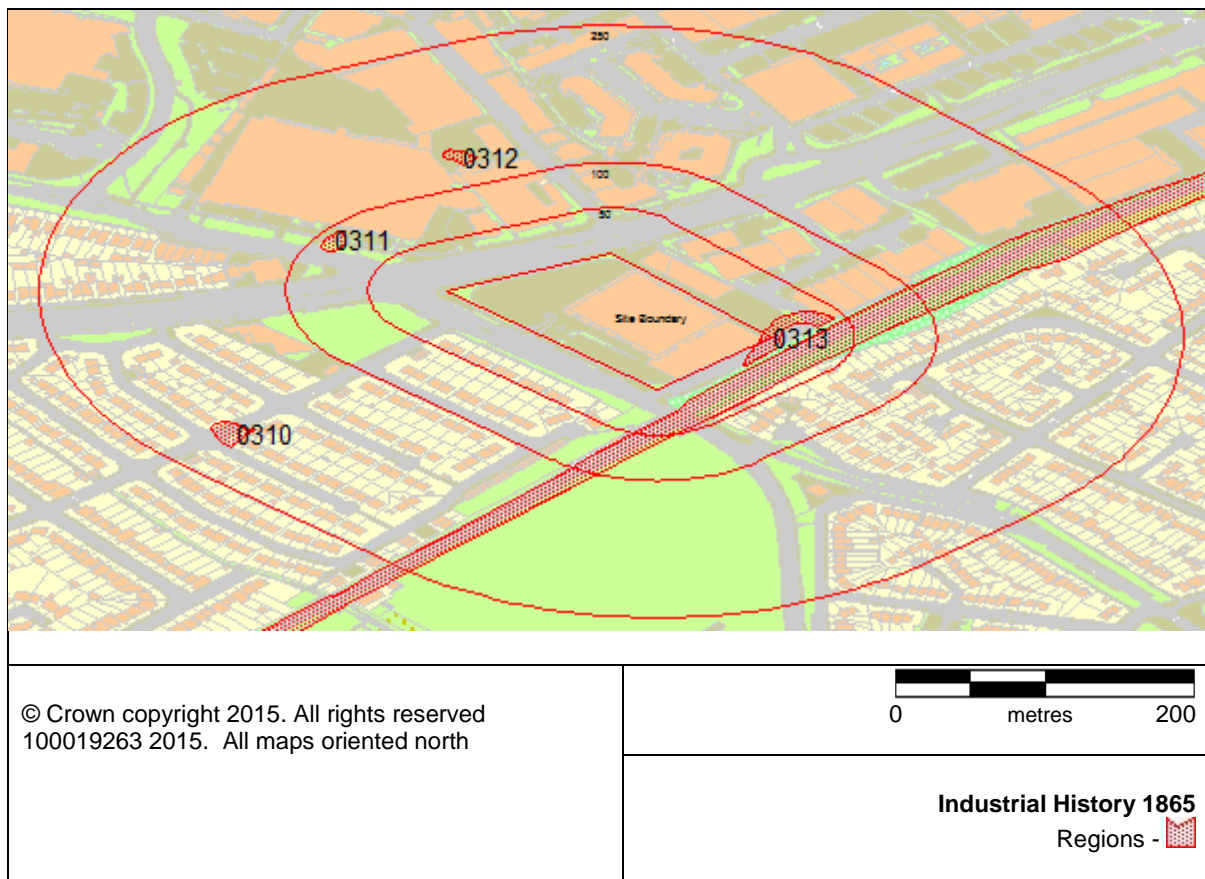
Number of features selected: 149 within 250 metres

Industrial History 1865

Source: Ordnance Survey County Series Maps, 1st edition. Original map scale: 1:2500

Number of features selected: 5 within 250 metres

Map overview of selected features



ID	Description	Survey Date	Comments
On site			
0313	Land Formerly Covered by Water	1865	Pond
Off site - Within 50m			
0052	Land used for Railway Purposes	1865	No data



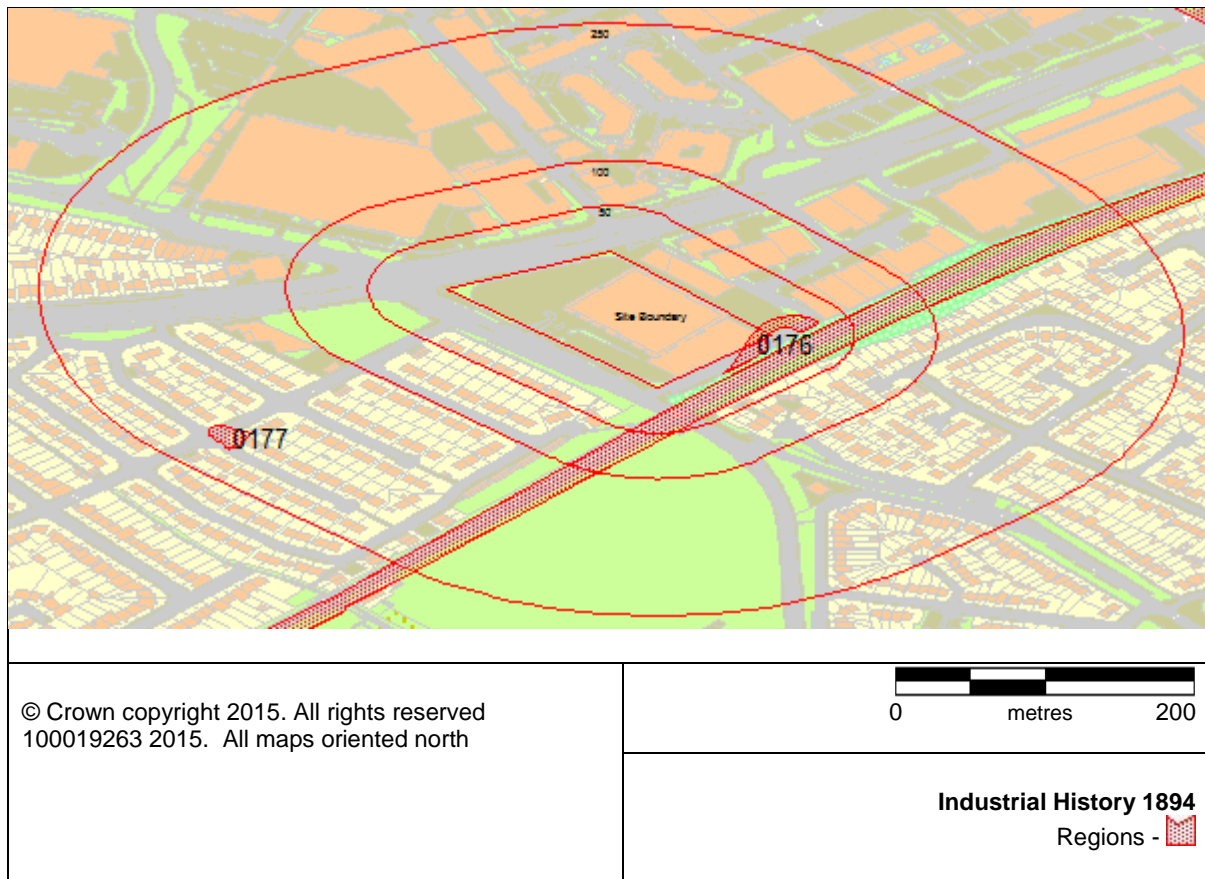
ID	Description	Survey Date	Comments
Off site - Within 50 - 100m			
0311	Land Formerly Covered by Water	1865	Pond
Off site - Within 100 - 250m			
0310	Land Formerly Covered by Water	1865	No data
0312	Land Formerly Covered by Water	1865	Pond

Industrial History 1894

Source: Ordnance Survey County Series Maps, 2nd edition. Original map scale: 1:2500

Number of features selected: 3 within 250 metres

Map overview of selected features



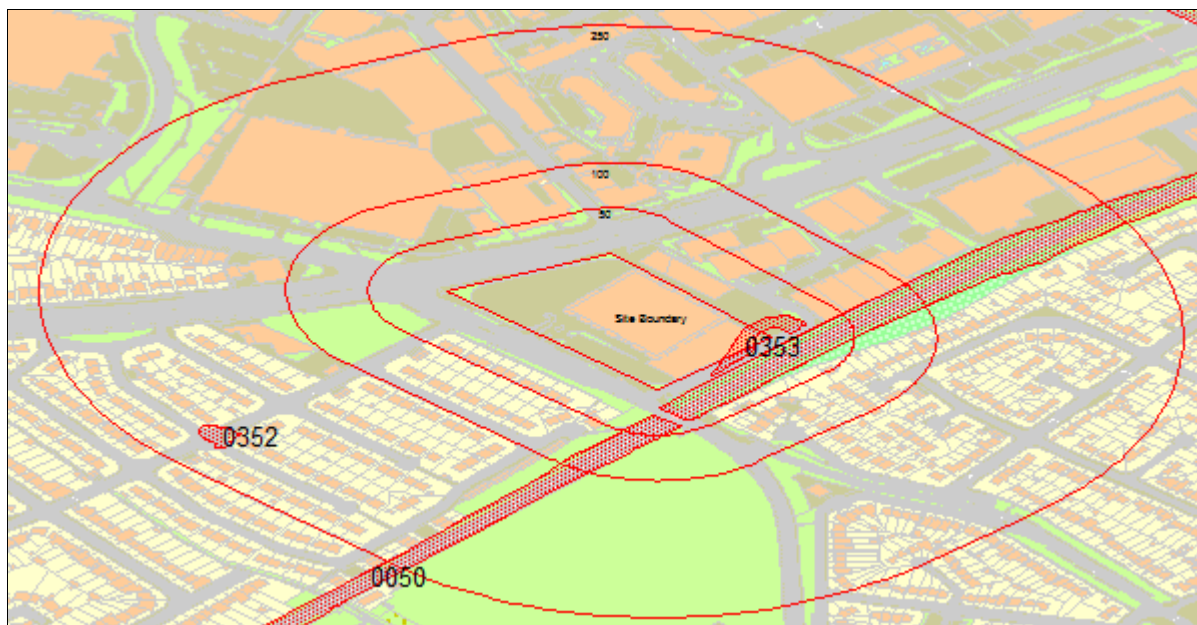
ID	Description	Survey Date	Comments
On site			
0176	Land Formerly Covered by Water	1894	No data
Off site - Within 50m			
0073	Land used for Railway Purposes	1894	No data
Off site - Within 50 - 100m			
None			
Off site - Within 100 - 250m			
0177	Land Formerly Covered by Water	1894	No data

Industrial History 1913


Source: Ordnance Survey County Series Maps, 3rd edition. Original map scale: 1:2500

Number of features selected: 4 within 250 metres

Map overview of selected features



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0 metres 200

Industrial History 1913
Regions - 

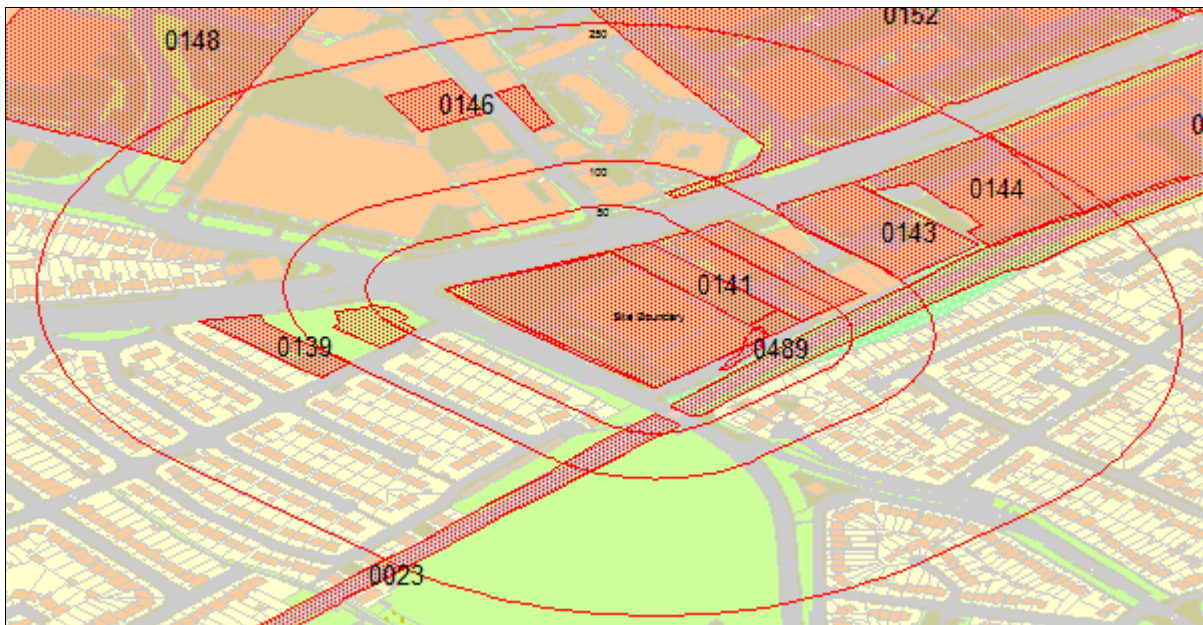
ID	Description	Survey Date	Comments
On site			
0353	Land formerly covered by water	1913	Pond
Off site - Within 50m			
0050	Land used for Railway purposes	1913	No data
0054	Land used for Railway purposes	1913	No data
Off site - Within 50 - 100m			
None			
Off site - Within 100 - 250m			
0352	Land formerly covered by water	1913	Pond

Industrial History 1934


Source: Ordnance Survey County Series Maps, 4th edition. Original map scale: 1:2500

Number of features selected: 15 within 250 metres

Map overview of selected features



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0 metres 200

Industrial History 1934
Regions - 

ID	Description	Survey Date	Comments
On site			
0140	Industrial Area	1934	Isleworth Winery
0141	Industrial Area	1934	Brittol House
0489	Land Formerly Covered by Water	1934	Pond
Off site - Within 50m			
0023	Railway Land	1934	No data
0024	Railway Land	1934	No data
0142	Industrial Area	1934	Perfume Manufactory
0281	Garages	1934	Syon Hill Garage

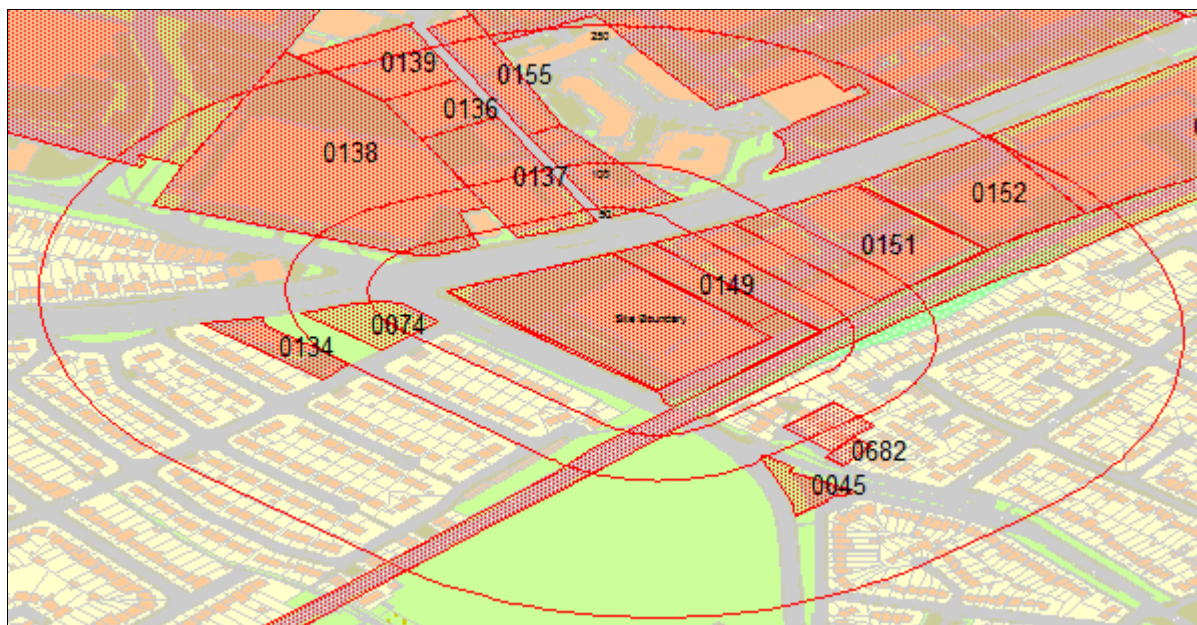
ID	Description	Survey Date	Comments
Off site - Within 50 - 100m			
0139	Industrial Area	1934	Solder Manufactory
0143	Industrial Area	1934	Motor Car Service Station,
0152	Industrial Area	1934	Rubber Tyre Manufactory
Off site - Within 100 - 250m			
0144	Industrial Area	1934	Motor Car Service Station,
0145	Industrial Area	1934	Fire Extinguishers Manufactory,
0146	Industrial Area	1934	Paper Manufactory
0147	Industrial Area	1934	Engineering Works
0148	Industrial Area	1934	Imperial Biscuit Works

Industrial History 1947


Source: Council Held Land Use Surveys. Original map scale: 1:2500


Number of features selected: 20 within 250 metres

Map overview of selected features



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0 metres 200

Industrial History 1947
Regions - 

ID	Description	Survey Date	Comments
On site			
0148	Industrial Area	1947	ISLEWORTH WINERY
Off site - Within 50m			
0074	Garage	1947	SYON HILL GARAGE
0137	Industrial Area	1947	GENERAL ENGINEERING
0138	Industrial Area	1947	GILLETTES
0149	Industrial Area	1947	No data
0150	Industrial Area	1947	PERFUME MANUFACTURE

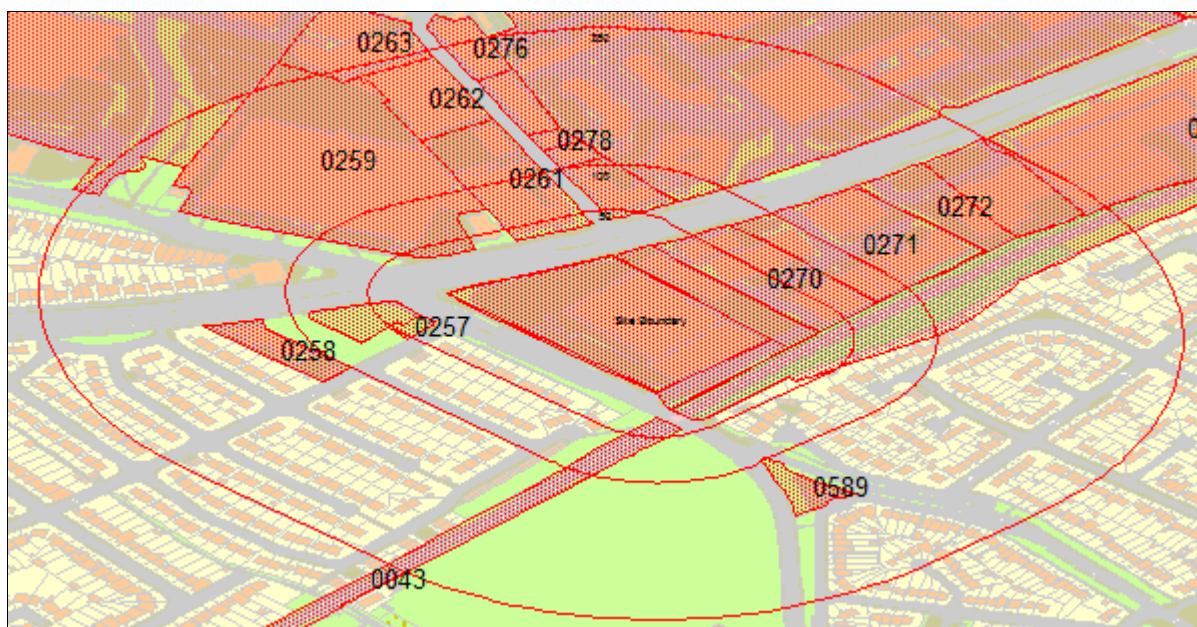
ID	Description	Survey Date	Comments
0154	Industrial Area	1947	FIRE DRUM MANUFACTURE
0529	Land used for railway purposes	1947	No data
Off site - Within 50 - 100m			
0045	Electricity Sub Station	1947	No data
0134	Industrial Area	1947	SOLDER MANUFACTURE
0151	Industrial Area	1947	MOTOR CAR SERVICE STATION
0683	Building used for storage	1947	No data
Off site - Within 100 - 250m			
0135	Industrial Area	1947	IMPERIAL BISCUIT WORKS
0136	Industrial Area	1947	PAPER MANUFACTURE
0139	Industrial Area	1947	GERRARD INDUSTRIES
0152	Industrial Area	1947	MOTOR CAR SERVICE STATION
0153	Industrial Area	1947	FIRE EXSTINGUISHER MANUFACTURE
0155	Industrial Area	1947	ALL TOOLS LTD
0156	Industrial Area	1947	RUBBER TYRE MANUFACTURE
0682	Building used for storage	1947	No data

Industrial History 1957


Source: Council Held Land Use Surveys. Original map scale: 1:2500


Number of features selected: 24 within 250 metres

Map overview of selected features



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0 metres 200

Industrial History 1957
Regions - 

ID	Description	Survey Date	Comments
On site			
0269	Industrial Area	1957	No data
1143	Industrial Area	1957	Amiralty Oil Laboratories
Off site - Within 50m			
0043	Land used for railway purposes	1957	No data
0044	Land used for railway purposes	1957	No data
0257	Industrial Area	1957	Engineers
0259	Industrial Area	1957	Gillettes
0261	Industrial Area	1957	Siemens Schuckert

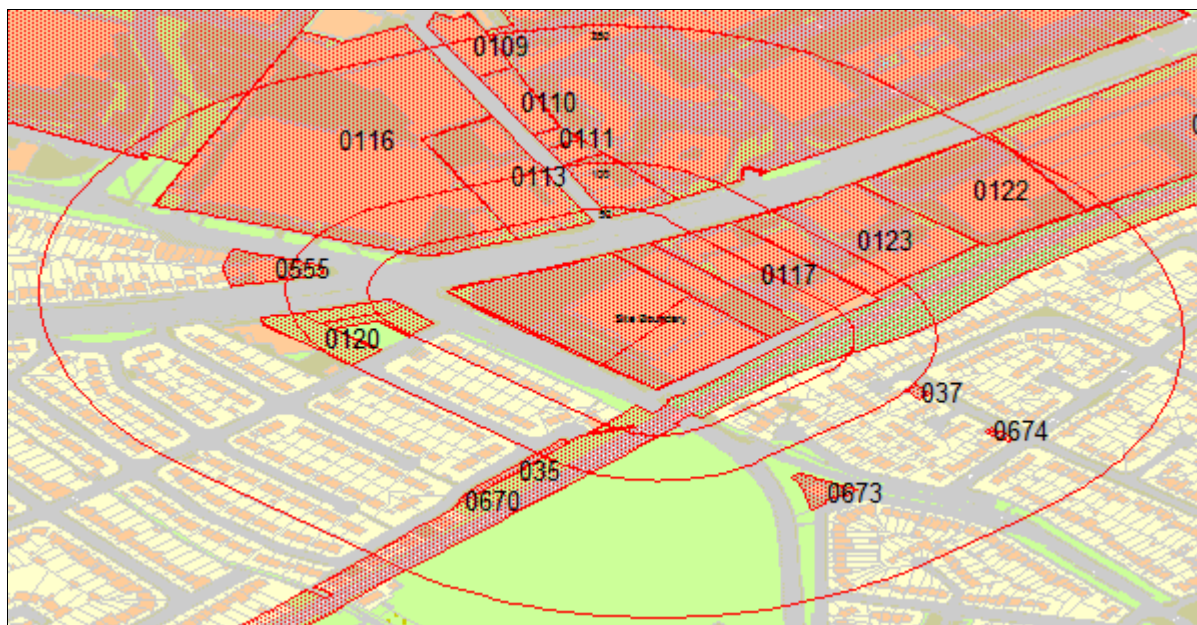
ID	Description	Survey Date	Comments
0270	Industrial Area	1957	Coty (Perfume Factory)
0280	Industrial Area	1957	Bowaters Fibre Drums
0514	Garage	1957	Syon Hill Garage
Off site - Within 50 - 100m			
0258	Industrial Area	1957	Soldering Fluxes
0271	Industrial Area	1957	Motor Car Service Station (with showroom)
0275	Industrial Area	1957	Firestone (rubber Tyre factory)
0279	Industrial Area	1957	Eynstone
0589	Electricity Sub Station	1957	No data
Off site - Within 100 - 250m			
0260	Industrial Area	1957	MacFarlane-Lang
0262	Industrial Area	1957	Toni Cosmetics
0263	Industrial Area	1957	Gerard Industries, Edwards Electrical - Boundary not clear
0272	Industrial Area	1957	Pakard
0273	Industrial Area	1957	Sperry's (Motor Car Services)
0274	Industrial Area	1957	Pyrene - Fire Extinguishers
0276	Industrial Area	1957	All Tools
0277	Industrial Area	1957	Instruments LMK Ltd
0278	Industrial Area	1957	Electrical

Industrial History 1966

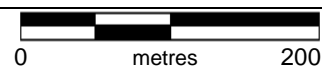
Source: Greater London Council Land Use Survey. Original map scale: 1:1250

Number of features selected: 41 within 250 metres



Map overview of selected features



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Industrial History 1966

Regions - 
Lines - 

ID	Description	Survey Date	Comments
On site			
0118	Industrial	1966	No data
0119	Industrial	1966	No data
0977	Food and Non Food Storage, furniture and other storage	1966	No data
0978	Food and Non Food Storage, furniture and other storage	1966	No data

ID	Description	Survey Date	Comments
Off site - Within 50m			
0113	Industrial	1966	No data
0116	Industrial	1966	No data
0117	Industrial	1966	No data
0556	Petrol filling stations	1966	No data
0858	Railway Land	1966	No data
0975	Food and Non Food Storage, furniture and other storage	1966	No data
0976	Food and Non Food Storage, furniture and other storage	1966	No data
0980	Food and Non Food Storage, furniture and other storage	1966	No data
1682	Road haulage depots, Taxi garages, Bus garages, Vehicle Depots	1966	No data
Off site - Within 50 - 100m			
0120	Industrial	1966	No data
0121	Industrial	1966	No data
0123	Industrial	1966	No data
0555	Petrol filling stations	1966	No data
0974	Food and Non Food Storage, furniture and other storage	1966	No data
0979	Food and Non Food Storage, furniture and other storage	1966	No data
0981	Food and Non Food Storage, furniture and other storage	1966	No data
035	Lock Up Garages	1966	No data

ID	Description	Survey Date	Comments
037	Lock Up Garages	1966	No data
Off site - Within 100 - 250m			
0106	Industrial	1966	No data
0109	Industrial	1966	No data
0110	Industrial	1966	No data
0111	Industrial	1966	No data
0112	Industrial	1966	No data
0115	Industrial	1966	No data
0122	Industrial	1966	No data
0124	Industrial	1966	No data
0670	Electrical power stations, transformers and sub stations	1966	No data
0673	Electrical power stations, transformers and sub stations	1966	No data
0674	Electrical power stations, transformers and sub stations	1966	No data
0965	Food and Non Food Storage, furniture and other storage	1966	No data
0970	Food and Non Food Storage, furniture and other storage	1966	No data
0971	Food and Non Food Storage, furniture and other storage	1966	No data
0972	Food and Non Food Storage, furniture and other storage	1966	No data



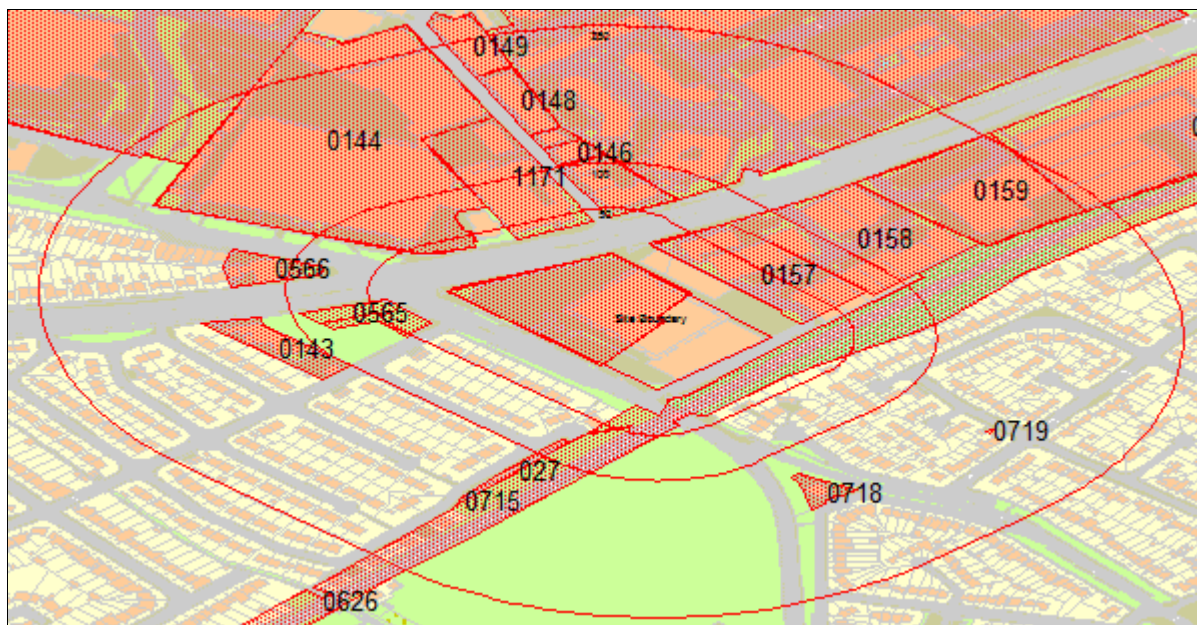
ID	Description	Survey Date	Comments
0982	Food and Non Food Storage, furniture and other storage	1966	No data
0983	Food and Non Food Storage, furniture and other storage	1966	No data
1680	Road haulage depots, Taxi garages, Bus garages, Vehicle Depots	1966	No data
036	Lock Up Garages	1966	No data

Industrial History 1971

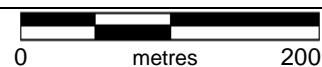
Source: Greater London Council Land Use Survey. Original map scale: 1:1250


Number of features selected: 37 within 250 metres

Map overview of selected features



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Industrial History 1971
Regions - 

ID	Description	Survey Date	Comments
On site			
0142	Industrial	1971	No data
1167	Food and Non food storage, furniture repositories and other storage	1971	No data
Off site - Within 50m			
0144	Industrial	1971	No data
0145	Industrial	1971	No data
0157	Industrial	1971	No data
0565	Petrol Filling Stations	1971	No data

ID	Description	Survey Date	Comments
0626	Railway land	1971	No data
1168	Food and Non food storage, furniture repositories and other storage	1971	No data
1170	Food and Non food storage, furniture repositories and other storage	1971	No data
1171	Food and Non food storage, furniture repositories and other storage	1971	No data
1176	Food and Non food storage, furniture repositories and other storage	1971	No data
1937	Road haulage depots, taxi garages, bus garages, vehicle repair garages	1971	No data
1938	Road haulage depots, taxi garages, bus garages, vehicle repair garages	1971	No data
Off site - Within 50 - 100m			
0143	Industrial	1971	No data
0158	Industrial	1971	No data
0160	Industrial	1971	No data
0566	Petrol Filling Stations	1971	No data
1169	Food and Non food storage, furniture repositories and other storage	1971	No data
1191	Food and Non food storage, furniture repositories and other storage	1971	No data
1943	Road haulage depots, taxi garages, bus garages, vehicle repair garages	1971	No data
027	lock up garages	1971	No data
Off site - Within 100 - 250m			

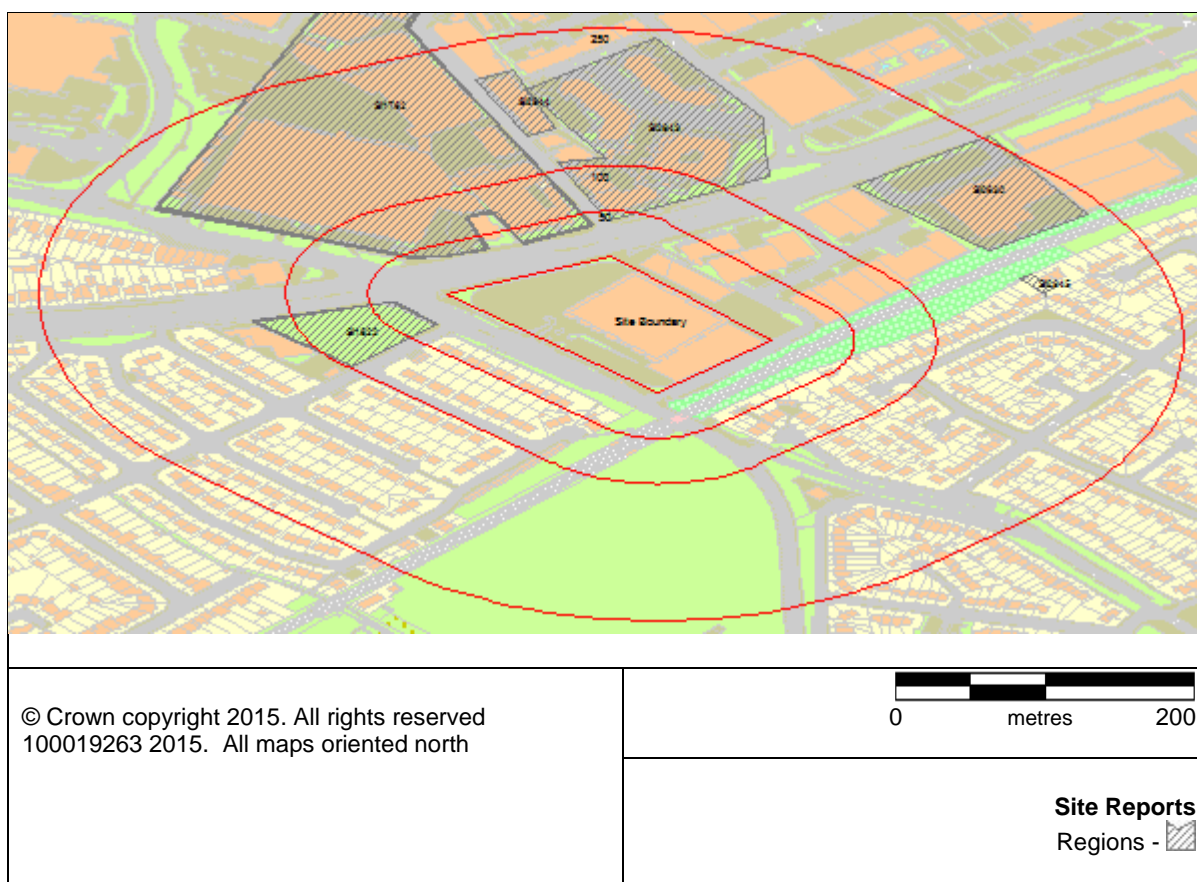
ID	Description	Survey Date	Comments
0146	Industrial	1971	No data
0147	Industrial	1971	No data
0148	Industrial	1971	No data
0149	Industrial	1971	No data
0154	Industrial	1971	No data
0159	Industrial	1971	No data
0715	Electrical power stations, transformers and sub stations	1971	No data
0718	Electrical power stations, transformers and sub stations	1971	No data
0719	Electrical power stations, transformers and sub stations	1971	No data
0968	Vacant industrial buildings	1971	No data
1172	Food and Non food storage, furniture repositories and other storage	1971	No data
1173	Food and Non food storage, furniture repositories and other storage	1971	No data
1174	Food and Non food storage, furniture repositories and other storage	1971	No data
1175	Food and Non food storage, furniture repositories and other storage	1971	No data
1184	Food and Non food storage, furniture repositories and other storage	1971	No data
1186	Food and Non food storage, furniture repositories and other storage	1971	No data

Site Reports

The following reports refer to sites within 250 metres of the site boundary but may not be specific to the site in question; please refer to the map below for details. All reports are public documents and, as such, can be viewed free of charge at the Civic Centre offices of the London Borough of Hounslow. If you wish to view any of the reports please contact the Land Quality Team so that the appropriate arrangements can be made. Photocopying facilities are available but are subject to charge.

Number of features selected: 19

Map overview of selected features



Total of 19 record(s) identified within 250 metres
0 record(s) identified on site.

Records identified within 50 metres buffer

Record 1

ID: SI1762

Name: Gillettes

Address: No Data

Type: Remediation Method Statement

Public: Y

Reference No: 1456

Report Reference: No data
Report Title: Isleworth Remediation - Overview and Way Forward
Consultant: P&G
Date: 22/09/2008
Report Description: No data

Record 2

ID: SI1822
Name: Environmental Assessment Report
Address: No Data
Type: Site Investigation

Public: Y
Reference No: No data
Report Reference: 4D/042/212
Report Title: Environmental Assessment Report
Consultant: SLR Consulting Limited
Date: 01/09/2002
Report Description: No data

Record 3

ID: SI1823
Name: Soil and Groundwater Investigation
Address: No Data
Type: Site Investigation Report

Public: Y
Reference No: No data
Report Reference: UK05/LO200196/CS
Report Title: SOIL AND GROUNDWATER INVESTIGATION
Consultant: AIG CONSULTANTS LIMITED
Date: 28/11/2005
Report Description: No data

Record 4

ID: SI1824
Name: QUANTITATIVE RISK ASSESSMENT REPORT
Address: No Data
Type: Site Investigation Report

Public: Y
Reference No: No data
Report Reference: UK06/LO200196/CS
Report Title: QUANTITATIVE RISK ASSESSMENT REPORT
Consultant: AIG CONSULTANTS LIMITED
Date: 01/04/2006
Report Description: No data

Record 5

ID: SI1825
Name: GROUND CONTAMINATION RISK ASSESSMENT REP
Address: No Data
Type: Site Investigation

Public: Y

Reference No: No data
Report Reference: 100466/SI/R001/01
Report Title: GROUND CONTAMINATION RISK ASSESSMENT REPORT
Consultant: AIG ENGINEERING GROUP LIMITED
Date: 01/08/2007
Report Description: No data

Record 6

ID: SI1826
Name: Remedial Action Plan
Address: No Data
Type: Site Investigation

Public: Y
Reference No: No data
Report Reference: 22748
Report Title: Remedial Action Plan
Consultant: RSK
Date: 14/12/2007
Report Description: No data

Record 7

ID: SI1827
Name: Proposed Remedial Works
Address: No Data
Type: Site Investigation Report

Public: Y
Reference No: No data
Report Reference: 22748/L03/tc
Report Title: Proposed Remedial Works
Consultant: RSK Group Plc
Date: 28/01/2008
Report Description: No data

Record 8

ID: SI1828
Name: Method Statement for Excavation
Address: No Data
Type: Site Investigation Report

Public: Y
Reference No: No data
Report Reference: 22748-L04 (00)
Report Title: method Statementfor Excavation
Consultant: RSK Group Plc
Date: 01/02/2008
Report Description: No data

Record 9

ID: SI1829
Name: Validation Report
Address: No Data
Type: Site Investigation Report

Public: Y
Reference No: No data
Report Reference: 22748L04/ajc
Report Title: Validation Report
Consultant: RSK Group Plc
Date: 19/02/2009
Report Description: No data

Record 10

ID: SI1830
Name: Petroleum Officer Data
Address: No Data
Type: Site Investigation Report

Public: Y
Reference No: No data
Report Reference: FSR/PET/25/003795/DM
Report Title: Petroleum Officer Report
Consultant: Petroleum Officer
Date: 10/06/2008
Report Description: No data

Record 11

ID: SI1831
Name: Desk Study and Walkover Report
Address: No Data
Type: Site Investigation Report

Public: Y
Reference No: No data
Report Reference: 9.5787
Report Title: Desk Study and Site Walkover Report
Consultant: Constructive Evaluation Limited
Date: 01/03/2009
Report Description: No data

Record 12

ID: SI1832
Name: Site Investigation Report
Address: No Data
Type: Site Investigation Report

Public: Y
Reference No: No data
Report Reference: 9.5787
Report Title: Site Investigation Report
Consultant: Constructive Evaluation Ltd
Date: 01/05/2009
Report Description: No data

Record 13

ID: SI2692
Name: Former Syon Gate Service Station
Address: No Data
Type: Site Investigation

Public: Y
Reference No: No data
Report Reference: 15.8827
Report Title: Phase I Environmental Risk Assessment
Consultant: Constructive Evaluation
Date: No data
Report Description: No data

Record 14

ID: SI2843
Name: Desk Study
Address: No Data
Type: Desk Study

Public: Y
Reference No: No data
Report Reference: UK16-23406
Report Title: PHASE I ENVIRONMENTAL ASSESSMENT
Consultant: Ramboll Environ
Date: 01/08/2016
Report Description: No data

Record 15

ID: SI3042
Name: Phase I Risk Assessment
Address: Great West Road
Type: Desk Study

Public: Y
Reference No: No data
Report Reference: No data
Report Title: Phase 1 Environmental Risk Assessment
Consultant: Constructive Evaluation
Date: 01/08/2018
Report Description: No data

Records identified within 100 - 250 metres buffers

Record 16

ID: SI0630
Name: Transport Avenue
Address: No Data
Type: Site Investigation Report

Public: y
Reference No: 150
Report Reference: A70378/RSE/
Report Title: Landfill Gas Survey, Brentford. Site of old Queensway store.
Consultant: Rendel Science and Environment.
Date: 01/06/1993
Report Description: 971 Gt. West Road. Within 250m site AP4. Potentially contaminated

Record 17

ID: SI2944

Name: PHASE 1 DESK TOP STUDY– PRELIMINARY RISK
Address: No Data
Type: Desk Study

Public: Y
Reference No: No data
Report Reference: SES/AJAR/HR/1#1
Report Title: CONTAMINATED LAND RISK ASSESSMENT
Consultant: Soil Environment Services Ltd
Date: 12/12/2017
Report Description: No data

Record 18

ID: SI2945
Name: Desk Study and Site Investigation
Address: No Data
Type: Desk Study

Public: Y
Reference No: No data
Report Reference: 34809G/R/001/CD
Report Title: Desk Study and Site Investigation
Consultant: Knapp Hicks & Partners Ltd
Date: 01/09/2017
Report Description: No data

Record 19

ID: SI2970
Name: Remediation Strategy 80B Cherry Crescent
Address: No Data
Type: Remediation Strategy

Public: Y
Reference No: No data
Report Reference: FMG/elg
Report Title: No data
Consultant: Woodruff Building Contractors
Date: 23/03/2018
Report Description: No data

Proximity to Borough Boundary

No records were selected on this layer.

End of detailed report

Appendix E Ground Gas and Groundwater Monitoring Results

- **Ground Gas Monitoring Equipment**
- **Ground Gas Monitoring Results**
- **Low-Flow Multiparameter Readings**

Table E.1: Ground gas monitoring equipment list

Equipment	Description	Range/Accuracy
Gas Analyser	GFM430 (Serial No. 10205)	0 -100 % / ± 0.1 %
Photo Ionisation Detector	MiniRAE 2000 (serial No. 110-900772)	0.1-2000ppm $\pm 10\%$ or ± 2 ppm, whichever is greater



Project Name	Homebase, Syon Lane
Project Reference	WIE15238
Consultant	Andrew Le Masurier
Date	20/11/2018 - 21/11/2018
Time	09:30

Atmospheric Pressure	Pre Monitoring:	1003	Post Monitoring:	1002
General Atmospheric Pressure Condition			Falling	
Weather Conditions	Warm	Sunny	Overcast	Rain
Wind Conditions	Still	Slight Breeze	Strong breeze	
Ground Conditions	Dry	Damp	Wet	
Site Conditions				

Exploratory hole identity				BH1	Flow	<0.1		
				Ambient moitoring	DP	<0.1		
Seconds	CH₄ (%)	CO₂ (%)	O₂ (%)	LEL (%)	H₂S (ppm)	CO (ppm)	Water Level (m)	Base (m)
15	<0.1	0.2	14.8	<0.1	<1	3	2.43	3.93
30	<0.1	0.1	14.6	<0.1	<1	2		
45	<0.1	0.2	14.4	<0.1	<1	2		
60	<0.1	0.2	14.4	<0.1	<1	3		
90	<0.1	0.2	14.4	<0.1	<1	2		
120	<0.1	0.2	14.4	<0.1	<1	1		
180	<0.1	0.2	14.3	<0.1	<1	3		
Peak State	<0.1	0.2	14.3	<0.1	<1	3		
Comments:	PID: 6.3 ppm							

Exploratory hole identity				BH2	Flow	0.3		
				Ambient moitoring	DP	1		
Seconds	CH₄ (%)	CO₂ (%)	O₂ (%)	LEL (%)	H₂S (ppm)	CO (ppm)	Water Level (m)	Base (m)
15	<0.1	0.3	1.2	<0.1	<1	3	2.7	4.18
30	<0.1	0.3	0.8	<0.1	<1	2		
45	<0.1	0.3	0.5	<0.1	<1	8		
60	<0.1	0.3	0.4	<0.1	<1	12		
90	<0.1	0.3	0.4	<0.1	<1	12		
120	<0.1	0.3	0.4	<0.1	<1	12		
180	<0.1	0.3	0.4	<0.1	<1	12		
Peak State	<0.1	0.3	0.4	<0.1	<1	12		
Comments:	PID: 19.1 ppm							

Exploratory hole identity			BH3		Flow	<0.1		
			Ambient moitoring		DP	<0.1		
Seconds	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	LEL (%)	H ₂ S (ppm)	CO (ppm)	Water Level (m)	Base (m)
15	<0.1	2.4	14.9	<0.1	<1	<1	Dry	1.45
30	<0.1	2.3	14.7	<0.1	<1	<1		
45	<0.1	2.4	14.6	<0.1	<1	<1		
60	<0.1	2.4	14.6	<0.1	<1	<1		
90	<0.1	2.4	14.6	<0.1	<1	<1		
120	<0.1	2.4	14.6	<0.1	<1	<1		
180	<0.1	2.4	14.6	<0.1	<1	<1		
Peak State	<0.1	2.4	14.6	<0.1	<1	<1		
Comments:	PID: 0.4 ppm							

Exploratory hole identity			WS1		Flow	<0.1		
			Ambient moitoring		DP	<0.1		
Seconds	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	LEL (%)	H ₂ S (ppm)	CO (ppm)	Water Level (m)	Base (m)
15	<0.1	0.3	17.8	<0.1	<1	2	0.9	1.48
30	<0.1	0.2	17.7	<0.1	<1	1		
45	<0.1	0.1	17.7	<0.1	<1	2		
60	<0.1	0.2	17.7	<0.1	<1	1		
90	<0.1	0.2	17.7	<0.1	<1	2		
120	<0.1	0.2	17.7	<0.1	<1	2		
180	<0.1	0.2	17.7	<0.1	<1	1		
Peak State	<0.1	0.3	17.7	<0.1	<1	2		
Comments:	PID: 2.4 ppm							

Exploratory hole identity			WS2		Flow	<0.1		
			Ambient moitoring		DP	<0.1		
Seconds	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	LEL (%)	H ₂ S (ppm)	CO (ppm)	Water Level (m)	Base (m)
15	<0.1	0.7	12.6	<0.1	<1	3	0.95	2.72
30	<0.1	0.8	12	<0.1	<1	4		
45	<0.1	0.7	11.9	<0.1	<1	1		
60	<0.1	0.8	11.9	<0.1	<1	1		
90	<0.1	0.8	11.9	<0.1	<1	1		
120	<0.1	0.8	11.9	<0.1	<1	1		
180	<0.1	0.8	11.9	<0.1	<1	1		
Peak State	<0.1	0.8	11.9	<0.1	<1	4		
Comments:	PID: 9.8 ppm							

Exploratory hole identity			WS3		Flow	0.3		
Ambient moitoring					DP	1		
Seconds	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	LEL (%)	H ₂ S (ppm)	CO (ppm)	Water Level (m)	Base (m)
15	<0.1	<0.1	7.4	<0.1	<1	<1	Dry	1.2
30	<0.1	<0.1	7.3	<0.1	<1	<1		
45	<0.1	<0.1	7.2	<0.1	<1	<1		
60	<0.1	<0.1	7.3	<0.1	<1	<1		
90	<0.1	<0.1	7.3	<0.1	<1	<1		
120	<0.1	<0.1	7.3	<0.1	<1	<1		
180	<0.1	<0.1	7.3	<0.1	<1	<1		
Peak State	<0.1	<0.1	7.2	<0.1	<1	<1		
Comments:	PID: 7.6 ppm							

Low-Flow Test Report:

Test Date / Time: 11/20/2018 11:03:40 AM

Project: Syon Lane

Operator Name:

Location Name: WS1 Well Diameter: 5 cm Total Depth: 1.48 m Initial Depth to Water: 0.9 m	Flow Cell Volume: 90 ml Final Draw Down: 0 m	Instrument Used: SmarTROLL MP Serial Number: 439905
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5
11/20/2018 11:03 AM	00:00	9.97 pH	9.99 °C	2,035.9 µS/cm	10.22 mg/L		81.6 mV	90.00 cm
11/20/2018 11:04 AM	00:30	10.64 pH	9.93 °C	1,952.7 µS/cm	8.02 mg/L		88.7 mV	90.00 cm
11/20/2018 11:04 AM	01:00	10.92 pH	9.98 °C	1,834.9 µS/cm	6.33 mg/L		90.7 mV	90.00 cm
11/20/2018 11:05 AM	01:30	11.08 pH	10.19 °C	1,741.4 µS/cm	5.26 mg/L		93.0 mV	90.00 cm
11/20/2018 11:05 AM	02:00	11.19 pH	10.42 °C	1,659.9 µS/cm	4.59 mg/L		94.1 mV	90.00 cm
11/20/2018 11:06 AM	02:30	11.28 pH	10.63 °C	1,569.4 µS/cm	4.18 mg/L		94.4 mV	90.00 cm
11/20/2018 11:06 AM	03:00	11.37 pH	10.76 °C	1,490.9 µS/cm	3.88 mg/L		94.2 mV	90.00 cm
11/20/2018 11:07 AM	03:30	11.45 pH	10.87 °C	1,418.3 µS/cm	3.64 mg/L		93.8 mV	90.00 cm
11/20/2018 11:07 AM	04:00	11.50 pH	10.96 °C	1,361.4 µS/cm	3.46 mg/L		93.8 mV	90.00 cm
11/20/2018 11:08 AM	04:30	11.57 pH	11.01 °C	1,313.5 µS/cm	3.33 mg/L		93.5 mV	90.00 cm
11/20/2018 11:08 AM	05:00	11.61 pH	11.06 °C	1,270.5 µS/cm	3.21 mg/L		93.3 mV	90.00 cm
11/20/2018 11:09 AM	05:30	11.64 pH	11.10 °C	1,238.6 µS/cm	3.11 mg/L		93.5 mV	90.00 cm
11/20/2018 11:09 AM	06:00	11.67 pH	11.13 °C	1,220.9 µS/cm	3.02 mg/L		93.8 mV	90.00 cm
11/20/2018 11:10 AM	06:30	11.69 pH	11.15 °C	1,196.2 µS/cm	2.94 mg/L		94.0 mV	90.00 cm
11/20/2018 11:10 AM	07:00	11.71 pH	11.15 °C	1,184.0 µS/cm	2.89 mg/L		94.1 mV	90.00 cm
11/20/2018 11:11 AM	07:30	11.73 pH	11.17 °C	1,174.2 µS/cm	2.85 mg/L		94.3 mV	90.00 cm

Samples

Sample ID:	Description:
WS1	2 x bottles, 2 x vials

Low-Flow Test Report:

Test Date / Time: 11/20/2018 11:34:08 AM

Project: Syon Lane

Operator Name:

Location Name: WS2 Well Diameter: 5 cm Total Depth: 2.72 m Initial Depth to Water: 0.95 m	Flow Cell Volume: 90 ml Final Draw Down: 0 m	Instrument Used: SmarTROLL MP Serial Number: 439905
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5
11/20/2018 11:34 AM	00:00	7.92 pH	9.75 °C	1,489.9 µS/cm	0.64 mg/L		-112.2 mV	95.00 cm
11/20/2018 11:34 AM	00:30	8.15 pH	9.80 °C	1,372.6 µS/cm	0.80 mg/L		-114.6 mV	95.00 cm
11/20/2018 11:35 AM	01:00	8.19 pH	9.89 °C	1,256.4 µS/cm	0.89 mg/L		-102.1 mV	95.00 cm
11/20/2018 11:35 AM	01:30	8.12 pH	10.08 °C	1,203.6 µS/cm	0.96 mg/L		-85.2 mV	95.00 cm
11/20/2018 11:36 AM	02:00	8.05 pH	10.36 °C	1,237.0 µS/cm	0.99 mg/L		-87.6 mV	95.00 cm
11/20/2018 11:36 AM	02:30	8.06 pH	10.64 °C	1,209.0 µS/cm	0.89 mg/L		-85.8 mV	95.00 cm
11/20/2018 11:37 AM	03:00	8.02 pH	10.79 °C	1,220.6 µS/cm	0.79 mg/L		-81.6 mV	95.00 cm

Samples

Sample ID:	Description:
WS2	2 x bottles, 2 x vials

Low-Flow Test Report:

Test Date / Time: 11/20/2018 12:59:28 PM

Project: Syon Lane

Operator Name:

Location Name: BH2 Well Diameter: 5 cm Total Depth: 4.18 m Initial Depth to Water: 2.7 m	Flow Cell Volume: 90 ml Final Draw Down: 0.01 m	Instrument Used: SmarTROLL MP Serial Number: 439905
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5
11/20/2018 12:59 PM	00:00	7.28 pH	8.24 °C	1,005.0 µS/cm	8.18 mg/L		-17.6 mV	270.00 cm
11/20/2018 12:59 PM	00:30	7.32 pH	11.48 °C	699.17 µS/cm	5.18 mg/L		-23.9 mV	270.00 cm
11/20/2018 1:00 PM	01:00	7.33 pH	12.64 °C	573.90 µS/cm	3.19 mg/L		-22.7 mV	270.00 cm
11/20/2018 1:00 PM	01:30	7.32 pH	13.40 °C	553.57 µS/cm	2.04 mg/L		-19.3 mV	270.00 cm
11/20/2018 1:01 PM	02:00	7.31 pH	13.97 °C	543.25 µS/cm	1.35 mg/L		-15.8 mV	270.00 cm
11/20/2018 1:01 PM	02:30	7.30 pH	14.27 °C	540.45 µS/cm	0.93 mg/L		-12.5 mV	270.00 cm
11/20/2018 1:02 PM	03:00	7.29 pH	14.49 °C	538.33 µS/cm	0.65 mg/L		-9.7 mV	270.00 cm
11/20/2018 1:02 PM	03:30	7.29 pH	14.63 °C	536.99 µS/cm	0.47 mg/L		-7.2 mV	270.00 cm
11/20/2018 1:03 PM	04:00	7.28 pH	14.71 °C	537.16 µS/cm	0.35 mg/L		-4.9 mV	270.00 cm

Samples

Sample ID:	Description:
BH2	

Low-Flow Test Report:

Test Date / Time: 11/21/2018 11:39:14 AM

Project: Syon Lane

Operator Name:

Location Name: BH1 Well Diameter: 5 cm Total Depth: 3.93 m Initial Depth to Water: 2.43 m	Flow Cell Volume: 90 ml Final Draw Down: 0 m	Instrument Used: SmarTROLL MP Serial Number: 439905
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.3	+/- 10	+/- 10	+/- 5
11/21/2018 11:39 AM	00:00	8.83 pH	15.08 °C	2,604.1 µS/cm	3.23 mg/L		173.8 mV	243.00 cm
11/21/2018 11:39 AM	00:30	8.84 pH	14.87 °C	2,628.3 µS/cm	2.62 mg/L		148.0 mV	243.00 cm
11/21/2018 11:40 AM	01:00	8.85 pH	14.78 °C	2,640.8 µS/cm	2.17 mg/L		134.6 mV	243.00 cm
11/21/2018 11:40 AM	01:30	8.86 pH	14.74 °C	2,648.1 µS/cm	1.82 mg/L		127.6 mV	243.00 cm
11/21/2018 11:41 AM	02:00	8.87 pH	14.71 °C	2,652.8 µS/cm	1.55 mg/L		123.7 mV	243.00 cm
11/21/2018 11:41 AM	02:30	8.87 pH	14.68 °C	2,656.6 µS/cm	1.35 mg/L		121.4 mV	243.00 cm
11/21/2018 11:42 AM	03:00	8.88 pH	14.67 °C	2,658.5 µS/cm	1.19 mg/L		119.9 mV	243.00 cm
11/21/2018 11:42 AM	03:30	8.88 pH	14.67 °C	2,658.9 µS/cm	1.07 mg/L		119.0 mV	243.00 cm

Samples

Sample ID:	Description:
BH1	2 x bottles, 2 x vials

Appendix F

Environmental Laboratory Analysis

- **Soils**
- **Groundwater**



Jon Coates

Waterman Infrastructure & Environment Ltd
Pickfords Wharf
Clink Street
London
SE1 9DG

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Analytical Report Number : 18-17267

Project / Site name:	67 Syon Lane	Samples received on:	06/11/2018
Your job number:	WIE15238-100	Samples instructed on:	06/11/2018
Your order number:	94131	Analysis completed by:	12/11/2018
Report Issue Number:	1	Report issued on:	12/11/2018
Samples Analysed:	6 soil samples		

Signed 

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1084590			1084591			1084592			1084593			1084594		
Sample Reference	WS1			WS2			WS2			WS2			WS2		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Depth (m)	0.10-0.30			0.10-0.30			1.00-1.20			2.60-2.90			3.80-4.00		
Date Sampled	02/11/2018			02/11/2018			02/11/2018			02/11/2018			02/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status												
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	4.6	3.5	20	28	22							
Total mass of sample received	kg	0.001	NONE	2.0	1.9	1.8	1.6	1.1							

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	-	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8	8.9	8.0	7.8	8.4
Organic Matter	%	0.1	MCERTS	3.9	1.8	2.2	3.7	0.6

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	0.57	< 0.05	-	1.4	-
Anthracene	mg/kg	0.05	MCERTS	0.21	< 0.05	-	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	0.57	< 0.05	-	1.4	-
Pyrene	mg/kg	0.05	MCERTS	0.51	< 0.05	-	1.3	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.72	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.67	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.76	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.33	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.55	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	1.9	< 0.9	-	7.1	-
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Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1084590	1084591	1084592	1084593	1084594
Sample Reference	WS1	WS2	WS2	WS2	WS2
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.10-0.30	0.10-0.30	1.00-1.20	2.60-2.90	3.80-4.00
Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Element	Unit	Limit of detection	Accreditation Status	1084590	1084591	1084592	1084593	1084594
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	19	-	15	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	410	670	-	79	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	< 0.06	< 0.06	-	0.63	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.4	-	3.2	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	1.1	-	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.8	9.4	-	29	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	11	10	-	27	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	31	130	-	64	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3	-
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	< 0.25	< 0.25	-	0.25	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.4	5.7	-	23	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	46	21	-	55	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	150	-	64	-

Monoaromatics

Compound	Unit	Limit of detection	Accreditation Status	1084590	1084591	1084592	1084593	1084594
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

Compound	Unit	Limit of detection	Accreditation Status	1084590	1084591	1084592	1084593	1084594
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	2.5	0.37	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	42	95	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	5.2	< 2.0	510	480	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	14	< 8.0	650	350	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	150	120	210	110	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	160	300	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	170	120	1400	1000	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	320	420	1400	1000	< 10

Compound	Unit	Limit of detection	Accreditation Status	1084590	1084591	1084592	1084593	1084594
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	0.042	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	4.3	< 1.0	7.2	31	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	13	< 2.0	240	290	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	44	< 10	490	400	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	260	310	230	250	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	370	700	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	320	320	960	970	< 10
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	690	1000	960	970	< 10

Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1084590	1084591	1084592	1084593	1084594
Sample Reference	WS1	WS2	WS2	WS2	WS2
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.10-0.30	0.10-0.30	1.00-1.20	2.60-2.90	3.80-4.00
Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

VOCs

Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Styrene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	5.7	-
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	15	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	22	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	8.5	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-



Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1084590	1084591	1084592	1084593	1084594
Sample Reference	WS1	WS2	WS2	WS2	WS2
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.10-0.30	0.10-0.30	1.00-1.20	2.60-2.90	3.80-4.00
Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

VOCs TICs

VOCs TICs Compound Name		N/A	NONE	-	-	Octane, 2,6-dimethyl-93	Benzene, 1-methyl-4-propyl-90	-
VOC % Match	%	N/A	NONE	-	-			-
VOCs TICs Compound Name		N/A	NONE	-	-	Naphthalene, decahydro-2-methyl-93	Naphthalene, decahydro-2-methyl-90	-
VOC % Match	%	N/A	NONE	-	-			-
VOCs TICs Compound Name		N/A	NONE	-	-	Benzene, 1,2,4,5-tetramethyl-92	-	-
VOC % Match	%	N/A	NONE	-	-			-
VOCs TICs Compound Name		N/A	NONE	-	-	Cyclohexane, 1,1,3-trimethyl-90	-	-
VOC % Match	%	N/A	NONE	-	-			-

Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1084590			1084591		1084592		1084593		1084594	
Sample Reference	WS1			WS2		WS2		WS2		WS2	
Sample Number	None Supplied			None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	0.10-0.30			0.10-0.30		1.00-1.20		2.60-2.90		3.80-4.00	
Date Sampled	02/11/2018			02/11/2018		02/11/2018		02/11/2018		02/11/2018	
Time Taken	None Supplied			None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status								

SVOCs											
Compound	Units	Limit of detection	Accreditation Status	1084590	1084591	1084592	1084593	1084594	1084590	1084591	1084592
Aniline	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	< 0.2	< 0.2	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	2.0	2.4	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	< 0.3	< 0.3	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	0.99	1.4	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	1.4	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	1.3	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	< 0.3	< 0.3	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.72	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.67	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.76	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.33	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.55	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-	-	-	-

Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1084590	1084591	1084592	1084593	1084594
Sample Reference	WS1	WS2	WS2	WS2	WS2
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.10-0.30	0.10-0.30	1.00-1.20	2.60-2.90	3.80-4.00
Date Sampled	02/11/2018	02/11/2018	02/11/2018	02/11/2018	02/11/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs TICs

SVOCs TICs Compound Name	SVOC % Match	N/A	NONE	-	-	Naphthalene, 2,3-dimethyl-	Naphthalene, 1,4,6-trimethyl-	-
	%	N/A	NONE	-	-	96	96	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Naphthalene, 1,6,7-trimethyl-	Naphthalene, 2,7-dimethyl-	-
SVOC % Match	%	N/A	NONE	-	-	96	95	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Naphthalene, 1,6-dimethyl-	Cyclopentane, 1-pentyl-2-propyl-	-
SVOC % Match	%	N/A	NONE	-	-	95	93	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Dibenzothiophene, 3-methyl-	3-Octadecene, (E)	-
SVOC % Match	%	N/A	NONE	-	-	95	92	-
SVOCs TICs Compound Name		N/A	NONE	-	-	2-Methyl-Z-4-tetradecene	Cyclooctacosane	-
SVOC % Match	%	N/A	NONE	-	-	93	92	-
SVOCs TICs Compound Name		N/A	NONE	-	-	3-(methoxycarbonyl)	quinone, 1-(3-hydroxy-3-phenyl-	-
SVOC % Match	%	N/A	NONE	-	-	93	92	-
SVOCs TICs Compound Name		N/A	NONE	-	-	quinone, 1-(3-hydroxy-3-phenyl-	Naphthalene, 1,3-dimethyl-	-
SVOC % Match	%	N/A	NONE	-	-	93	91	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Cyclotriacontane	Dodecane, 2,6,10-trimethyl-	-
SVOC % Match	%	N/A	NONE	-	-	92	91	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Naphthalene, 2,7-dimethyl-	1,3,8-p-Menthatriene	-
SVOC % Match	%	N/A	NONE	-	-	91	90	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-



Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1085186				
Sample Reference				WS1				
Sample Number				None Supplied				
Depth (m)				1.50-1.80				
Date Sampled				02/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	16				
Total mass of sample received	kg	0.001	NONE	2.0				

Asbestos in Soil	Type	N/A	ISO 17025	-				
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	11.0				
Organic Matter	%	0.1	MCERTS	0.8				

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-				
Acenaphthylene	mg/kg	0.05	MCERTS	-				
Acenaphthene	mg/kg	0.05	MCERTS	-				
Fluorene	mg/kg	0.05	MCERTS	-				
Phenanthrene	mg/kg	0.05	MCERTS	-				
Anthracene	mg/kg	0.05	MCERTS	-				
Fluoranthene	mg/kg	0.05	MCERTS	-				
Pyrene	mg/kg	0.05	MCERTS	-				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-				
Chrysene	mg/kg	0.05	MCERTS	-				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-				
Coronene	mg/kg	0.05	NONE	-				

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	-				
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Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1085186				
Sample Reference				WS1				
Sample Number				None Supplied				
Depth (m)				1.50-1.80				
Date Sampled				02/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.7				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	75				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.20				
Boron (water soluble)	mg/kg	0.2	MCERTS	3.5				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	< 0.25				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.7				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	23				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	46				

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	ug/kg	1	MCERTS	< 1.0				
Ethylbenzene	ug/kg	1	MCERTS	< 1.0				
p & m-xylene	ug/kg	1	MCERTS	< 1.0				
o-xylene	ug/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.7				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	9.2				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	35				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	150				
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	26				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	200				
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	220				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	24				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	54				
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	80				
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	80				



Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1085186				
Sample Reference				WS1				
Sample Number				None Supplied				
Depth (m)				1.50-1.80				
Date Sampled				02/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0				
Chloroethane	µg/kg	1	NONE	< 1.0				
Bromomethane	µg/kg	1	ISO 17025	< 1.0				
Vinyl Chloride	µg/kg	1	NONE	< 1.0				
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0				
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0				
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0				
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0				
Trichloromethane	µg/kg	1	MCERTS	< 1.0				
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0				
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0				
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0				
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0				
Benzene	µg/kg	1	MCERTS	< 1.0				
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0				
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0				
Trichloroethene	µg/kg	1	MCERTS	< 1.0				
Dibromomethane	µg/kg	1	MCERTS	< 1.0				
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0				
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0				
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0				
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0				
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0				
Tetrachloroethene	µg/kg	1	NONE	< 1.0				
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0				
Chlorobenzene	µg/kg	1	MCERTS	< 1.0				
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-Xylene	µg/kg	1	MCERTS	< 1.0				
Styrene	µg/kg	1	MCERTS	< 1.0				
Tribromomethane	µg/kg	1	NONE	< 1.0				
o-Xylene	µg/kg	1	MCERTS	< 1.0				
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0				
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0				
Bromobenzene	µg/kg	1	MCERTS	< 1.0				
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0				
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0				
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0				
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0				
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0				
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0				
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0				
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0				
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0				
Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0				
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0				
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0				
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0				



Analytical Report Number: 18-17267
Project / Site name: 67 Syon Lane
Your Order No: 94131

Lab Sample Number				1085186				
Sample Reference				WS1				
Sample Number				None Supplied				
Depth (m)				1.50-1.80				
Date Sampled				02/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs TICs								
VOCs TICs Compound Name		N/A	NONE	ND				
VOC % Match	%	N/A	NONE	-				
VOCs TICs Compound Name		N/A	NONE	-				
VOC % Match	%	N/A	NONE	-				
VOCs TICs Compound Name		N/A	NONE	-				
VOC % Match	%	N/A	NONE	-				
VOCs TICs Compound Name		N/A	NONE	-				
VOC % Match	%	N/A	NONE	-				

Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1085186				
Sample Reference				WS1				
Sample Number				None Supplied				
Depth (m)				1.50-1.80				
Date Sampled				02/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1				
Phenol	mg/kg	0.2	ISO 17025	< 0.2				
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1				
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2				
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1				
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1				
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3				
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05				
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3				
4-Methylphenol	mg/kg	0.2	NONE	< 0.2				
Isophorone	mg/kg	0.2	MCERTS	< 0.2				
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3				
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3				
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3				
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3				
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1				
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1				
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1				
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1				
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2				
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1				
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1				
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1				
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2				
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2				
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3				
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Azobenzene	mg/kg	0.3	MCERTS	< 0.3				
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2				
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Phenanthrene	mg/kg	0.05	MCERTS	1.8				
Anthracene	mg/kg	0.05	MCERTS	0.42				
Carbazole	mg/kg	0.3	MCERTS	< 0.3				
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3				
Fluoranthene	mg/kg	0.05	MCERTS	2.0				
Pyrene	mg/kg	0.05	MCERTS	1.7				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.68				
Chrysene	mg/kg	0.05	MCERTS	0.51				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.62				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.25				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.43				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.24				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.28				



Analytical Report Number: 18-17267

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1085186				
Sample Reference				WS1				
Sample Number				None Supplied				
Depth (m)				1.50-1.80				
Date Sampled				02/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	Eicosane				
SVOC % Match	%	N/A	NONE	96				
SVOCs TICs Compound Name		N/A	NONE	Benzo[e]pyrene				
SVOC % Match	%	N/A	NONE	96				
SVOCs TICs Compound Name		N/A	NONE	Octadecane				
SVOC % Match	%	N/A	NONE	95				
SVOCs TICs Compound Name		N/A	NONE	Dotriacontane				
SVOC % Match	%	N/A	NONE	95				
SVOCs TICs Compound Name		N/A	NONE	Heptacosane, 1-chloro-				
SVOC % Match	%	N/A	NONE	95				
SVOCs TICs Compound Name		N/A	NONE	Heptadecane				
SVOC % Match	%	N/A	NONE	94				
SVOCs TICs Compound Name		N/A	NONE	Naphthalene, 2,3,6-trimethyl-				
SVOC % Match	%	N/A	NONE	93				
SVOCs TICs Compound Name		N/A	NONE	Cyclopropa[1]phenanthrene, 1a,9b-				
SVOC % Match	%	N/A	NONE	93				
SVOCs TICs Compound Name		N/A	NONE	pyridine-3-carboxamide, oxime, N-(2-				
SVOC % Match	%	N/A	NONE	93				
SVOCs TICs Compound Name		N/A	NONE	Heneicosane				
SVOC % Match	%	N/A	NONE	93				



Analytical Report Number : 18-17267

Project / Site name: 67 Syon Lane

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1084590	WS1	None Supplied	0.10-0.30	Brown clay and sand with gravel and clinker.
1084591	WS2	None Supplied	0.10-0.30	Brown gravelly clay.
1084592	WS2	None Supplied	1.00-1.20	Brown clay and sand with gravel.
1084593	WS2	None Supplied	2.60-2.90	Brown clay and sand with gravel and vegetation.
1084594	WS2	None Supplied	3.80-4.00	Brown clay.
1085186	WS1	None Supplied	1.50-1.80	Light brown sandy clay with gravel.

Analytical Report Number : 18-17267

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE



Analytical Report Number : 18-17267

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Tentatively identified compounds (SVOC) in soil	Determination of semi-volatile organic compounds total ion count in soil by extraction with dichloromethane and hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L064-PL	D	NONE
Tentatively identified compounds (VOC) in soil	Determination of volatile organic compounds total ion count in soil by headspace GC-MS followed by a full library scan.	In-house method based on USEPA8260	L073-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/cleanup.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



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Analytical Report Number : 18-17702

Replaces Analytical Report Number : 18-17702, issue no. 1

Project / Site name:	67 Syon Lane	Samples received on:	07/11/2018
Your job number:	WIE15238-100	Samples instructed on:	08/11/2018
Your order number:	PO 94071	Analysis completed by:	20/11/2018
Report Issue Number:	2	Report issued on:	20/11/2018
Samples Analysed:	7 soil samples		

Signed:

Dr Claire Stone
Quality Manager

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number	1087297	1087298	1087299	1087300	1087301			
Sample Reference	BH1	BH1	BH1	WS03	WS03			
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Depth (m)	0.60-0.80	1.00-1.20	2.40-2.60	0.15-0.20	0.80-1.00			
Date Sampled	06/11/2018	06/11/2018	06/11/2018	05/11/2018	05/11/2018			
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	53	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.5	6.8	10	5.9	5.4
Total mass of sample received	kg	0.001	NONE	1.8	2.0	1.7	2.0	1.6

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Not-detected	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001	0.027	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001	0.027	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.6	11.4	10.5	9.4	7.8
Total Cyanide	mg/kg	1	MCERTS	-	-	< 1	-	-
Complex Cyanide	mg/kg	1	MCERTS	-	-	< 1	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-	< 1	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.83	-	-
Sulphide	mg/kg	1	MCERTS	-	-	75	-	-
Total Sulphur	mg/kg	50	MCERTS	-	-	2400	-	-
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	-	-	< 0.5	-	-
Organic Matter	%	0.1	MCERTS	0.8	0.5	0.7	1.6	< 0.1

Phenols by HPLC

Catechol	mg/kg	0.1	ISO 17025	-	-	< 0.10	-	-
Resorcinol	mg/kg	0.1	ISO 17025	-	-	< 0.10	-	-
Cresols (o-, m-, p-)	mg/kg	0.3	ISO 17025	-	-	< 0.30	-	-
Total Naphthols (sum of 1- and 2- Naphthol)	mg/kg	0.2	ISO 17025	-	-	< 0.20	-	-
2-Isopropylphenol	mg/kg	0.1	ISO 17025	-	-	< 0.10	-	-
Phenol	mg/kg	0.1	ISO 17025	-	-	< 0.10	-	-
Trimethylphenol (2,3,5-)	mg/kg	0.1	ISO 17025	-	-	< 0.10	-	-
Total Xylenols and Ethylphenols	mg/kg	0.3	ISO 17025	-	-	< 0.30	-	-

Total Phenols

Total Phenols (HPLC)	mg/kg	1.3	ISO 17025	-	-	< 1.3	-	-
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Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number	1087297			1087298			1087299			1087300			1087301		
Sample Reference	BH1			BH1			BH1			WS03			WS03		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Depth (m)	0.60-0.80			1.00-1.20			2.40-2.60			0.15-0.20			0.80-1.00		
Date Sampled	06/11/2018			06/11/2018			06/11/2018			05/11/2018			05/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status												

Speciated PAHs

Parameter	Units	Limit of detection	Accreditation Status	1087297	1087298	1087299	1087300	1087301
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.3	-	0.57	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.34	-	0.11	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.7	-	0.74	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	1.4	-	0.60	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.70	-	0.30	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.61	-	0.28	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.88	-	0.40	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.21	-	0.14	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.67	-	0.36	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.32	-	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.36	-	< 0.05	< 0.05	< 0.05
Coronene	mg/kg	0.05	NONE	< 0.05	-	< 0.05	< 0.05	< 0.05

Total PAH

Parameter	Units	Limit of detection	Accreditation Status	1087297	1087298	1087299	1087300	1087301
Total WAC-17 PAHs	mg/kg	0.85	NONE	8.4	-	3.5	< 0.9	< 0.9

Heavy Metals / Metalloids

Parameter	Units	Limit of detection	Accreditation Status	1087297	1087298	1087299	1087300	1087301
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	10	8.0	6.9	26
Barium (aqua regia extractable)	mg/kg	1	MCERTS	69	55	100	510	32
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.46	0.22	0.28	0.29	1.0
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	2.8	4.3	1.7	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.4	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	20	23	11	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	16	19	16	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	27	23	43	39	9.3
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	1.7	0.82	0.74	0.31	0.86
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	16	18	11	40
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.9	< 1.0	1.5
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	27	24	33	16	62
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	31	54	73	38

Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number	1087297			1087298			1087299			1087300			1087301		
Sample Reference	BH1			BH1			BH1			WS03			WS03		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Depth (m)	0.60-0.80			1.00-1.20			2.40-2.60			0.15-0.20			0.80-1.00		
Date Sampled	06/11/2018			06/11/2018			06/11/2018			05/11/2018			05/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status												

Monoaromatics

Parameter	Units	Limit of detection	Accreditation Status	1087297	1087298	1087299	1087300	1087301
Benzene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

Parameter	Units	Limit of detection	Accreditation Status	1087297	1087298	1087299	1087300	1087301
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	1.1	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	5.7	8.9	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	27	17	8.4
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	200	190	89
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-	< 8.4	180	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	230	210	97
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	-	230	390	97

Parameter	Units	Limit of detection	Accreditation Status	1087297	1087298	1087299	1087300	1087301
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	2.6	-	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	13	-	16	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	26	-	44	280	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-	< 8.4	540	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	41	-	61	290	< 10
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	41	-	61	830	< 10

Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number	1087297	1087298	1087299	1087300	1087301
Sample Reference	BH1	BH1	BH1	WS03	WS03
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.60-0.80	1.00-1.20	2.40-2.60	0.15-0.20	0.80-1.00
Date Sampled	06/11/2018	06/11/2018	06/11/2018	05/11/2018	05/11/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

VOCs

Compound	Units	Limit of detection	Accreditation Status	1087297	1087298	1087299	1087300	1087301
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Chloroethane	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Styrene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Tribromomethane	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-



Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number	1087297	1087298	1087299	1087300	1087301
Sample Reference	BH1	BH1	BH1	WS03	WS03
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.60-0.80	1.00-1.20	2.40-2.60	0.15-0.20	0.80-1.00
Date Sampled	06/11/2018	06/11/2018	06/11/2018	05/11/2018	05/11/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

VOCs TICs

VOCs TICs Compound Name	Units	Limit of detection	Accreditation Status	1087297	1087298	1087299	1087300	1087301
VOCs TICs Compound Name		N/A	NONE	0	-	0	0	-
VOC % Match	%	N/A	NONE	0	-	0	0	-
VOCs TICs Compound Name		N/A	NONE	0	-	0	0	-
VOC % Match	%	N/A	NONE	0	-	0	0	-
VOCs TICs Compound Name		N/A	NONE	0	-	0	0	-
VOC % Match	%	N/A	NONE	0	-	0	0	-
VOCs TICs Compound Name		N/A	NONE	0	-	0	0	-
VOC % Match	%	N/A	NONE	0	-	0	0	-
VOCs TICs Compound Name		N/A	NONE	0	-	0	0	-
VOC % Match	%	N/A	NONE	0	-	0	0	-
VOCs TICs Compound Name		N/A	NONE	0	-	0	0	-
VOC % Match	%	N/A	NONE	0	-	0	0	-
VOCs TICs Compound Name		N/A	NONE	0	-	0	0	-
VOC % Match	%	N/A	NONE	0	-	0	0	-
VOCs TICs Compound Name		N/A	NONE	0	-	0	0	-
VOC % Match	%	N/A	NONE	0	-	0	0	-

Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number	1087297			1087298			1087299			1087300			1087301		
Sample Reference	BH1			BH1			BH1			WS03			WS03		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Depth (m)	0.60-0.80			1.00-1.20			2.40-2.60			0.15-0.20			0.80-1.00		
Date Sampled	06/11/2018			06/11/2018			06/11/2018			05/11/2018			05/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status												

SVOCs															
Compound	Units	Limit of detection	Accreditation Status	1087297	1087298	1087299	1087300	1087301	1087297	1087298	1087299	1087300	1087301	1087297	1087298
Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-	< 0.1	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
Phenanthrene	mg/kg	0.05	MCERTS	1.3	-	0.57	< 0.05	-	1.3	-	0.57	< 0.05	-	1.3	-
Anthracene	mg/kg	0.05	MCERTS	0.34	-	0.11	< 0.05	-	0.34	-	0.11	< 0.05	-	0.34	-
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-	< 0.2	-
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
Fluoranthene	mg/kg	0.05	MCERTS	1.7	-	0.74	< 0.05	-	1.7	-	0.74	< 0.05	-	1.7	-
Pyrene	mg/kg	0.05	MCERTS	1.4	-	0.60	< 0.05	-	1.4	-	0.60	< 0.05	-	1.4	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.70	-	0.30	< 0.05	-	0.70	-	0.30	< 0.05	-	0.70	-
Chrysene	mg/kg	0.05	MCERTS	0.61	-	0.28	< 0.05	-	0.61	-	0.28	< 0.05	-	0.61	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.88	-	0.40	< 0.05	-	0.88	-	0.40	< 0.05	-	0.88	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.21	-	0.14	< 0.05	-	0.21	-	0.14	< 0.05	-	0.21	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.67	-	0.36	< 0.05	-	0.67	-	0.36	< 0.05	-	0.67	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.32	-	< 0.05	< 0.05	-	0.32	-	< 0.05	< 0.05	-	0.32	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.36	-	< 0.05	< 0.05	-	0.36	-	< 0.05	< 0.05	-	0.36	-



Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number	1087297	1087298	1087299	1087300	1087301
Sample Reference	BH1	BH1	BH1	WS03	WS03
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.60-0.80	1.00-1.20	2.40-2.60	0.15-0.20	0.80-1.00
Date Sampled	06/11/2018	06/11/2018	06/11/2018	05/11/2018	05/11/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	Benzo[e]pyrene	-	Eicosane	Homoandrostane, (5.alpha.,13.alpha)	-
SVOC % Match	%	N/A	NONE	96	-	95	92	-
SVOCs TICs Compound Name		N/A	NONE	di-p-Tolylacetylene	-	Hexadecane	Bromophenyl]-4-nitro-1,3-	-
SVOC % Match	%	N/A	NONE	95	-	94	92	-
SVOCs TICs Compound Name		N/A	NONE	Bisnorabieta-5,7,9(10),11,13-	-	Heptadecane, 9-octyl-	Demecolcine	-
SVOC % Match	%	N/A	NONE	93	-	94	92	-
SVOCs TICs Compound Name		N/A	NONE	Tetradecadien-1-ol acetate	-	Heptadecane	2,5-bis(1,1-dimethylethyl)-	-
SVOC % Match	%	N/A	NONE	92	-	94	91	-
SVOCs TICs Compound Name		N/A	NONE	Benz[a]anthracene, 7-methyl-	-	Pentadecane	2-Ethylacridine	-
SVOC % Match	%	N/A	NONE	91	-	92	91	-
SVOCs TICs Compound Name		N/A	NONE	Tricosane	-	Nonadecane	2,5-Furandione, 3-dodecyl-	-
SVOC % Match	%	N/A	NONE	90	-	91	90	-
SVOCs TICs Compound Name		N/A	NONE	4-Hydroxyphenyl pyrrolidinyl thione	-	Pentadecane, 8-heptyl-	0	-
SVOC % Match	%	N/A	NONE	90	-	91	0	-
SVOCs TICs Compound Name		N/A	NONE	0	-	Octacosane	0	-
SVOC % Match	%	N/A	NONE	0	-	91	0	-
SVOCs TICs Compound Name		N/A	NONE	0	-	Heneicosane, 11-(1-ethylpropyl)-	0	-
SVOC % Match	%	N/A	NONE	0	-	90	0	-
SVOCs TICs Compound Name		N/A	NONE	0	-	0	0	-
SVOC % Match	%	N/A	NONE	0	-	0	0	-



Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number	1087297	1087298	1087299	1087300	1087301
Sample Reference	BH1	BH1	BH1	WS03	WS03
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.60-0.80	1.00-1.20	2.40-2.60	0.15-0.20	0.80-1.00
Date Sampled	06/11/2018	06/11/2018	06/11/2018	05/11/2018	05/11/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

PCBs by GC-MS

PCB Congener	mg/kg	Limit of detection	Accreditation Status					
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-

Total PCBs by GC-MS

Total PCBs	mg/kg	Limit of detection	Accreditation Status					
Total PCBs	mg/kg	0.007	MCERTS	-	-	< 0.007	-	-

Glycols

Glycol	mg/kg	Limit of detection	Accreditation Status					
1,2-Butanediol	mg/kg	10	NONE	< 10	-	-	-	-
1,2-Propanediol	mg/kg	10	NONE	< 10	-	-	-	-
1,3-Butanediol	mg/kg	10	NONE	< 10	-	-	-	-
1,3-Propanediol	mg/kg	10	NONE	< 10	-	-	-	-
1,4-Butanediol	mg/kg	10	NONE	< 10	-	-	-	-
1,5-Pentanediol	mg/kg	10	NONE	< 10	-	-	-	-
Diethylene Glycol	mg/kg	10	NONE	< 10	-	-	-	-
Ethylene Glycol	mg/kg	10	NONE	< 10	-	-	-	-
Triethylene Glycol	mg/kg	10	NONE	< 10	-	-	-	-



Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number				1087302	1087303			
Sample Reference				WS04	WS04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.55-0.65	1.10-1.20			
Date Sampled				05/11/2018	05/11/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	6.4	6.8			
Total mass of sample received	kg	0.001	NONE	2.0	1.9			

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-			
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-			
Asbestos Quantification Total	%	0.001	ISO 17025	-	-			

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	11.1	10.6			
Total Cyanide	mg/kg	1	MCERTS	-	-			
Complex Cyanide	mg/kg	1	MCERTS	-	-			
Free Cyanide	mg/kg	1	MCERTS	-	-			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-			
Sulphide	mg/kg	1	MCERTS	-	-			
Total Sulphur	mg/kg	50	MCERTS	-	-			
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	-	-			
Organic Matter	%	0.1	MCERTS	0.8	0.9			

Phenols by HPLC

Catechol	mg/kg	0.1	ISO 17025	-	-			
Resorcinol	mg/kg	0.1	ISO 17025	-	-			
Cresols (o-, m-, p-)	mg/kg	0.3	ISO 17025	-	-			
Total Naphthols (sum of 1- and 2- Naphthol)	mg/kg	0.2	ISO 17025	-	-			
2-Isopropylphenol	mg/kg	0.1	ISO 17025	-	-			
Phenol	mg/kg	0.1	ISO 17025	-	-			
Trimethylphenol (2,3,5-)	mg/kg	0.1	ISO 17025	-	-			
Total Xylenols and Ethylphenols	mg/kg	0.3	ISO 17025	-	-			

Total Phenols

Total Phenols (HPLC)	mg/kg	1.3	ISO 17025	-	-			
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Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number				1087302	1087303			
Sample Reference				WS04	WS04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.55-0.65	1.10-1.20			
Date Sampled				05/11/2018	05/11/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.25			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.27			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.23			
Fluorene	mg/kg	0.05	MCERTS	0.21	0.42			
Phenanthrene	mg/kg	0.05	MCERTS	2.2	2.9			
Anthracene	mg/kg	0.05	MCERTS	0.72	0.85			
Fluoranthene	mg/kg	0.05	MCERTS	2.9	4.1			
Pyrene	mg/kg	0.05	MCERTS	2.6	3.7			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.4	1.3			
Chrysene	mg/kg	0.05	MCERTS	1.5	1.3			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.5	1.2			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.75	0.49			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	0.89			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.60	0.51			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.21	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.77	0.63			
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05			

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	17	19			
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	12			
Barium (aqua regia extractable)	mg/kg	1	MCERTS	140	150			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.27	0.28			
Boron (water soluble)	mg/kg	0.2	MCERTS	3.3	3.0			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.3			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	20			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	30			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	76	74			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.67	0.53			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	14			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29	29			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	69	74			



Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number				1087302	1087303			
Sample Reference				WS04	WS04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.55-0.65	1.10-1.20			
Date Sampled				05/11/2018	05/11/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	26	34			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	68	100			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	180	240			
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	40			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	280	370			
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	280	410			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	14	15			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	49	69			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	100	140			
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	56			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	160	220			
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	160	280			

Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number				1087302	1087303		
Sample Reference				WS04	WS04		
Sample Number				None Supplied	None Supplied		
Depth (m)				0.55-0.65	1.10-1.20		
Date Sampled				05/11/2018	05/11/2018		
Time Taken				None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
VOCs							
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0		
Chloroethane	µg/kg	1	NONE	-	< 1.0		
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0		
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0		
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0		
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0		
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0		
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0		
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0		
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0		
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0		
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0		
Benzene	µg/kg	1	MCERTS	-	< 1.0		
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0		
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0		
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0		
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0		
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0		
Toluene	µg/kg	1	MCERTS	-	< 1.0		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0		
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0		
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0		
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0		
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0		
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0		
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0		
Styrene	µg/kg	1	MCERTS	-	< 1.0		
Tribromomethane	µg/kg	1	NONE	-	< 1.0		
o-Xylene	µg/kg	1	MCERTS	-	< 1.0		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0		
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0		
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0		
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0		
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0		
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0		
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0		
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0		
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0		
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0		
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0		



Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number				1087302	1087303			
Sample Reference				WS04	WS04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.55-0.65	1.10-1.20			
Date Sampled				05/11/2018	05/11/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs TICs								
VOCs TICs Compound Name		N/A	NONE	-	0			
VOC % Match	%	N/A	NONE	-	0			
VOCs TICs Compound Name		N/A	NONE	-	0			
VOC % Match	%	N/A	NONE	-	0			
VOCs TICs Compound Name		N/A	NONE	-	0			
VOC % Match	%	N/A	NONE	-	0			
VOCs TICs Compound Name		N/A	NONE	-	0			
VOC % Match	%	N/A	NONE	-	0			
VOCs TICs Compound Name		N/A	NONE	-	0			
VOC % Match	%	N/A	NONE	-	0			
VOCs TICs Compound Name		N/A	NONE	-	0			
VOC % Match	%	N/A	NONE	-	0			
VOCs TICs Compound Name		N/A	NONE	-	0			
VOC % Match	%	N/A	NONE	-	0			
VOCs TICs Compound Name		N/A	NONE	-	0			
VOC % Match	%	N/A	NONE	-	0			
VOCs TICs Compound Name		N/A	NONE	-	0			
VOC % Match	%	N/A	NONE	-	0			

Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number				1087302	1087303		
Sample Reference				WS04	WS04		
Sample Number				None Supplied	None Supplied		
Depth (m)				0.55-0.65	1.10-1.20		
Date Sampled				05/11/2018	05/11/2018		
Time Taken				None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
SVOCs							
Aniline	mg/kg	0.1	NONE	-	< 0.1		
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2		
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1		
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3		
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05		
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3		
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2		
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2		
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3		
Naphthalene	mg/kg	0.05	MCERTS	-	0.25		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3		
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2		
2-Methylnaphthalene	mg/kg	0.1	NONE	-	0.7		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1		
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1		
Acenaphthylene	mg/kg	0.05	MCERTS	-	0.27		
Acenaphthene	mg/kg	0.05	MCERTS	-	0.23		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2		
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3		
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2		
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2		
Fluorene	mg/kg	0.05	MCERTS	-	0.42		
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2		
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3		
Phenanthrene	mg/kg	0.05	MCERTS	-	2.9		
Anthracene	mg/kg	0.05	MCERTS	-	0.85		
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3		
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2		
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3		
Fluoranthene	mg/kg	0.05	MCERTS	-	4.1		
Pyrene	mg/kg	0.05	MCERTS	-	3.7		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	1.3		
Chrysene	mg/kg	0.05	MCERTS	-	1.3		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	1.2		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.49		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	0.89		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.51		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.63		



Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number				1087302	1087303			
Sample Reference				WS04	WS04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.55-0.65	1.10-1.20			
Date Sampled				05/11/2018	05/11/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	-	Naphthalene, 1,6,7-trimethyl-			
SVOC % Match	%	N/A	NONE	-	97			
SVOCs TICs Compound Name		N/A	NONE	-	Heptadecane			
SVOC % Match	%	N/A	NONE	-	96			
SVOCs TICs Compound Name		N/A	NONE	-	Benzo[e]pyrene			
SVOC % Match	%	N/A	NONE	-	96			
SVOCs TICs Compound Name		N/A	NONE	-	Phenanthrene, 4- methyl-			
SVOC % Match	%	N/A	NONE	-	95			
SVOCs TICs Compound Name		N/A	NONE	-	Octadecane, 1- chloro-			
SVOC % Match	%	N/A	NONE	-	95			
SVOCs TICs Compound Name		N/A	NONE	-	Tetradecadien-1- ol acetate			
SVOC % Match	%	N/A	NONE	-	95			
SVOCs TICs Compound Name		N/A	NONE	-	Friedelan-3-one			
SVOC % Match	%	N/A	NONE	-	95			
SVOCs TICs Compound Name		N/A	NONE	-	Eicosane			
SVOC % Match	%	N/A	NONE	-	94			
SVOCs TICs Compound Name		N/A	NONE	-	Naphthalene, 1,4,6-trimethyl-			
SVOC % Match	%	N/A	NONE	-	93			
SVOCs TICs Compound Name		N/A	NONE	-	Dodecane, 2,6,10- trimethyl-			
SVOC % Match	%	N/A	NONE	-	93			



Analytical Report Number: 18-17702

Project / Site name: 67 Syon Lane

Your Order No: PO 94071

Lab Sample Number				1087302	1087303			
Sample Reference				WS04	WS04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.55-0.65	1.10-1.20			
Date Sampled				05/11/2018	05/11/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-			
PCB Congener 52	mg/kg	0.001	MCERTS	-	-			
PCB Congener 101	mg/kg	0.001	MCERTS	-	-			
PCB Congener 118	mg/kg	0.001	MCERTS	-	-			
PCB Congener 138	mg/kg	0.001	MCERTS	-	-			
PCB Congener 153	mg/kg	0.001	MCERTS	-	-			
PCB Congener 180	mg/kg	0.001	MCERTS	-	-			

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	-			
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Glycols

1,2-Butanediol	mg/kg	10	NONE	-	-			
1,2-Propanediol	mg/kg	10	NONE	-	-			
1,3-Butanediol	mg/kg	10	NONE	-	-			
1,3-Propanediol	mg/kg	10	NONE	-	-			
1,4-Butanediol	mg/kg	10	NONE	-	-			
1,5-Pentanediol	mg/kg	10	NONE	-	-			
Diethylene Glycol	mg/kg	10	NONE	-	-			
Ethylene Glycol	mg/kg	10	NONE	-	-			
Triethylene Glycol	mg/kg	10	NONE	-	-			



Analytical Report Number: 18-17702
Project / Site name: 67 Syon Lane
Your Order No: PO 94071

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1087297	BH1	0.60-0.80	190	Loose Fibres	Chrysotile	< 0.001	< 0.001
1087298	BH1	1.00-1.20	152	Loose Fibres	Chrysotile	< 0.001	< 0.001
1087299	BH1	2.40-2.60	160	Hard/Cement Type Material & Loose Fibres	Chrysotile	0.027	0.027

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



Analytical Report Number : 18-17702

Project / Site name: 67 Syon Lane

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1087297	BH1	None Supplied	0.60-0.80	Brown gravelly sand with stones.
1087298	BH1	None Supplied	1.00-1.20	Brown gravelly sand.
1087299	BH1	None Supplied	2.40-2.60	Brown clay and sand with gravel.
1087300	WS03	None Supplied	0.15-0.20	Brown sand with rubble and brick.
1087301	WS03	None Supplied	0.80-1.00	Brown sand with gravel.
1087302	WS04	None Supplied	0.55-0.65	Brown sand with rubble and brick.
1087303	WS04	None Supplied	1.10-1.20	Brown sand with rubble.

Analytical Report Number : 18-17702

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method,10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Determination of glycols in soil by GC-MS.	Determination of glycols in soil by GC-MS.	In-house method	L059B-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Phenols, speciated, in soil, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	ISO 17025
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS

Analytical Report Number : 18-17702

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Tentatively identified compounds (SVOC) in soil	Determination of semi-volatile organic compounds total ion count in soil by extraction with dichloromethane and hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L064-PL	D	NONE
Tentatively identified compounds (VOC) in soil	Determination of volatile organic compounds total ion count in soil by headspace GC-MS followed by a full library scan.	In-house method based on USEPA8260	L073-PL	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/cleanup.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



Jon Coates

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Analytical Report Number : 18-17769-B

Replaces Analytical Report Number : 18-17769, issue no. 1

Project / Site name:	34745 67 Syon Lane	Samples received on:	07/11/2018
Your job number:	WIE15238-100	Samples instructed on:	08/11/2018
Your order number:		Analysis completed by:	15/11/2018
Report Issue Number:	2	Report issued on:	16/11/2018
Samples Analysed:	2 soil samples		

Signed 

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-17769-B
 Project / Site name: 34745 67 Syon Lane

Lab Sample Number	1087685	1087686					
Sample Reference	HP05	HP05					
Sample Number	None Supplied	None Supplied					
Depth (m)	0.25-0.40	0.80-1.00					
Date Sampled	06/11/2018	06/11/2018					
Time Taken	None Supplied	None Supplied					
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	10	12		
Total mass of sample received	kg	0.001	NONE	2.0	2.0		

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite	Chrysotile & Amosite		
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected		
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.001	0.008		
Asbestos Quantification Total	%	0.001	ISO 17025	0.001	0.008		

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.4	10.0		
Organic Matter	%	0.1	MCERTS	2.0	1.7		

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	1.9	0.95		
Anthracene	mg/kg	0.05	MCERTS	0.40	0.32		
Fluoranthene	mg/kg	0.05	MCERTS	4.5	2.5		
Pyrene	mg/kg	0.05	MCERTS	3.6	2.8		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.1	1.4		
Chrysene	mg/kg	0.05	MCERTS	1.9	1.4		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.5	1.4		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.76	0.67		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.6	1.1		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.3	0.90		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.43	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.7	1.1		
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05		

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	23	15		
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	13		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	310	230		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.40	0.42		
Boron (water soluble)	mg/kg	0.2	MCERTS	3.6	7.8		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	0.4		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	26		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	32		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	170	170		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3		
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.40	0.68		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	19		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	36	39		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	200	160		



Analytical Report Number: 18-17769-B

Project / Site name: 34745 67 Syon Lane

Lab Sample Number	1087685			1087686		
Sample Reference	HP05			HP05		
Sample Number	None Supplied			None Supplied		
Depth (m)	0.25-0.40			0.80-1.00		
Date Sampled	06/11/2018			06/11/2018		
Time Taken	None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Monoaromatics

Compound	Units	Limit of detection	Accreditation Status	1087685	1087686
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	8.3	< 2.0
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	43	< 8.0
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	170	240
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	110	150
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	220	250
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	320	410

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	4.0	< 2.0
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	25	19
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	130	130
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	150	120
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	160	150
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	310	270



Analytical Report Number: 18-17769-B
 Project / Site name: 34745 67 Syon Lane

Lab Sample Number	1087685	1087686				
Sample Reference	HP05	HP05				
Sample Number	None Supplied	None Supplied				
Depth (m)	0.25-0.40	0.80-1.00				
Date Sampled	06/11/2018	06/11/2018				
Time Taken	None Supplied	None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

VOCs

Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	1087685	1087686		
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-		
Chloroethane	µg/kg	1	NONE	< 1.0	-		
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-		
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-		
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-		
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-		
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-		
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-		
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-		
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-		
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-		
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-		
Benzene	µg/kg	1	MCERTS	< 1.0	-		
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-		
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-		
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-		
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-		
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-		
Toluene	µg/kg	1	MCERTS	< 1.0	-		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-		
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-		
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-		
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-		
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-		
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-		
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-		
Styrene	µg/kg	1	MCERTS	< 1.0	-		
Tribromomethane	µg/kg	1	NONE	< 1.0	-		
o-Xylene	µg/kg	1	MCERTS	< 1.0	-		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-		
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-		
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-		
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-		
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-		
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-		
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-		
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-		
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-		
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-		
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-		



Analytical Report Number: 18-17769-B
 Project / Site name: 34745 67 Syon Lane

Lab Sample Number				1087685	1087686			
Sample Reference				HP05	HP05			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.25-0.40	0.80-1.00			
Date Sampled				06/11/2018	06/11/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs TICs								
VOCs TICs Compound Name		N/A	NONE	ND	-			
VOC % Match	%	N/A	NONE	-	-			



Analytical Report Number: 18-17769-B

Project / Site name: 34745 67 Syon Lane

Lab Sample Number	1087685	1087686					
Sample Reference	HP05	HP05					
Sample Number	None Supplied	None Supplied					
Depth (m)	0.25-0.40	0.80-1.00					
Date Sampled	06/11/2018	06/11/2018					
Time Taken	None Supplied	None Supplied					
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				

SVOCs							
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	1087685	1087686		
Aniline	mg/kg	0.1	NONE	< 0.1	-		
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-		
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-		
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-		
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-		
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-		
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-		
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-		
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-		
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-		
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-		
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-		
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-		
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-		
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-		
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-		
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-		
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-		
Phenanthrene	mg/kg	0.05	MCERTS	1.9	-		
Anthracene	mg/kg	0.05	MCERTS	0.40	-		
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-		
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-		
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-		
Fluoranthene	mg/kg	0.05	MCERTS	4.5	-		
Pyrene	mg/kg	0.05	MCERTS	3.6	-		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.1	-		
Chrysene	mg/kg	0.05	MCERTS	1.9	-		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.5	-		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.76	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.6	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.3	-		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.43	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.7	-		



Analytical Report Number: 18-17769-B

Project / Site name: 34745 67 Syon Lane

Lab Sample Number				1087685	1087686			
Sample Reference				HP05	HP05			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.25-0.40	0.80-1.00			
Date Sampled				06/11/2018	06/11/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	Anthracene, 9-methyl-	-			
SVOC % Match	%	N/A	NONE	93	-			
SVOCs TICs Compound Name		N/A	NONE	Perylene	-			
SVOC % Match	%	N/A	NONE	93	-			
SVOCs TICs Compound Name		N/A	NONE	Antra-9,10-quinone, 1-(3-hydroxy-3-phenyl-1-triazenyl)-	-			
SVOC % Match	%	N/A	NONE	93	-			
SVOCs TICs Compound Name		N/A	NONE	Pyrene, 1-methyl-	-			
SVOC % Match	%	N/A	NONE	91	-			
SVOCs TICs Compound Name		N/A	NONE	Tetracosane	-			
SVOC % Match	%	N/A	NONE	91	-			
SVOCs TICs Compound Name		N/A	NONE	Naphthalenecarboxylic acid, 2-benzoyl-	-			
SVOC % Match	%	N/A	NONE	91	-			
SVOCs TICs Compound Name		N/A	NONE	Dodecane	-			
SVOC % Match	%	N/A	NONE	90	-			
SVOCs TICs Compound Name		N/A	NONE	Cyclohexadecane, 1,2-diethyl-	-			
SVOC % Match	%	N/A	NONE	90	-			
SVOCs TICs Compound Name		N/A	NONE	Chrysene, 6-methyl-	-			
SVOC % Match	%	N/A	NONE	90	-			
SVOCs TICs Compound Name		N/A	NONE	Cyclohexane-1,3-dione, 2-allylaminoethyl-5,5-dimethyl-	-			
SVOC % Match	%	N/A	NONE	90	-			



Analytical Report Number: 18-17769
Project / Site name: 34745 67 Syon Lane
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1087685	HP05	0.25-0.40	145	Loose Fibres	Chrysotile & Amosite	0.001	0.001
1087686	HP05	0.80-1.00	134	Loose Fibrous Debris & Sheeting/Board Debris	Chrysotile & Amosite	0.008	0.008

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



Analytical Report Number : 18-17769-B

Project / Site name: 34745 67 Syon Lane

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1087685	HP05	None Supplied	0.25-0.40	Brown sand with gravel.
1087686	HP05	None Supplied	0.80-1.00	Brown sand with gravel.

Analytical Report Number : 18-17769-B

Project / Site name: 34745 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Tentatively identified compounds (SVOC) in soil	Determination of semi-volatile organic compounds total ion count in soil by extraction with dichloromethane and hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L064-PL	D	NONE
Tentatively identified compounds (VOC) in soil	Determination of volatile organic compounds total ion count in soil by headspace GC-MS followed by a full library scan.	In-house method based on USEPA8260	L073-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS



Analytical Report Number : 18-17769-B

Project / Site name: 34745 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



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Analytical Report Number : 18-18152

Replaces Analytical Report Number : 18-18152, issue no. 1

Project / Site name:	67 Syon Lane	Samples received on:	13/11/2018
Your job number:	WIE15238-100	Samples instructed on:	13/11/2018
Your order number:		Analysis completed by:	19/11/2018
Report Issue Number:	2	Report issued on:	19/11/2018
Samples Analysed:	2 soil samples		

Signed:

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-18152

Project / Site name: 67 Syon Lane

Lab Sample Number				1089713	1089714			
Sample Reference				BH1	BH1			
Sample Number				None Supplied	None Supplied			
Depth (m)				3.90-4.40	6.00-6.20			
Date Sampled				09/11/2018	09/11/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	2.0	19			
Total mass of sample received	kg	0.001	NONE	2.0	1.4			

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	8.4			
Organic Matter	%	0.1	MCERTS	< 0.1	1.6			

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05			

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.9	< 0.9			
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.6	-			
Barium (aqua regia extractable)	mg/kg	1	MCERTS	13	-			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.18	-			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	-			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	-			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	-			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	4.7	-			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-			
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	4.0	-			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	41	-			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	9.4	-			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	9.6	-			



Analytical Report Number: 18-18152

Project / Site name: 67 Syon Lane

Lab Sample Number	1089713			1089714				
Sample Reference	BH1			BH1				
Sample Number	None Supplied			None Supplied				
Depth (m)	3.90-4.40			6.00-6.20				
Date Sampled	09/11/2018			09/11/2018				
Time Taken	None Supplied			None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Compound	Units	Limit of detection	Accreditation Status	1089713	1089714		
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0		
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0		
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0		
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0		
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0		

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001		
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001		
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001		
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0		
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0		
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0		
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0		
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10		
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10		

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001		
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001		
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001		
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0		
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0		
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10		
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10		
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10		
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10		



Analytical Report Number : 18-18152

Project / Site name: 67 Syon Lane

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1089713	BH1	None Supplied	3.90-4.40	Non Soil **
1089714	BH1	None Supplied	6.00-6.20	Grey clay.

** Non MCerts Matrix

Analytical Report Number : 18-18152

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/cleanup.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



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Analytical Report Number : 18-18534

Replaces Analytical Report Number : 18-18534, issue no. 1

Project / Site name:	67 Syon Lane	Samples received on:	14/11/2018
Your job number:	WIE15238-100	Samples instructed on:	15/11/2018
Your order number:	PO 94131	Analysis completed by:	22/11/2018
Report Issue Number:	2	Report issued on:	22/11/2018
Samples Analysed:	3 soil samples		

Signed

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-18534

Project / Site name: 67 Syon Lane

Your Order No: PO 94131

Lab Sample Number	1092070			1092071	1092072		
Sample Reference	BH3			BH3	BH3		
Sample Number	None Supplied			None Supplied	None Supplied		
Depth (m)	0.30-0.50			1.00-1.20	2.70-2.90		
Date Sampled	13/11/2018			13/11/2018	13/11/2018		
Time Taken	None Supplied			None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	8.5	9.7	21	
Total mass of sample received	kg	0.001	NONE	1.8	1.9	1.3	

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	-	
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.4	9.6	7.5	
Organic Matter	%	0.1	MCERTS	0.6	0.3	0.5	

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	
Phenanthrene	mg/kg	0.05	MCERTS	1.1	< 0.05	-	
Anthracene	mg/kg	0.05	MCERTS	0.19	< 0.05	-	
Fluoranthene	mg/kg	0.05	MCERTS	1.5	< 0.05	-	
Pyrene	mg/kg	0.05	MCERTS	1.4	< 0.05	-	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.69	< 0.05	-	
Chrysene	mg/kg	0.05	MCERTS	0.61	< 0.05	-	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.66	< 0.05	-	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.28	< 0.05	-	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.52	< 0.05	-	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.26	< 0.05	-	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.34	< 0.05	-	
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	7.5	< 0.9	-	
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.8	-	14	
Barium (aqua regia extractable)	mg/kg	1	MCERTS	170	-	49	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.46	-	0.74	
Boron (water soluble)	mg/kg	0.2	MCERTS	3.2	-	1.6	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	-	45	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	-	20	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	61	-	14	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	< 0.25	-	< 0.25	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	-	40	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	39	-	79	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	-	77	



Analytical Report Number: 18-18534

Project / Site name: 67 Syon Lane

Your Order No: PO 94131

Lab Sample Number	1092070			1092071			1092072		
Sample Reference	BH3			BH3			BH3		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	0.30-0.50			1.00-1.20			2.70-2.90		
Date Sampled	13/11/2018			13/11/2018			13/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

Monoaromatics

Compound	Units	Limit of detection	Accreditation Status	1092070	1092071	1092072
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	5.0	< 2.0	< 2.0
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	16	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	46	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	65	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	67	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	130	< 10	< 10

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	2.4	< 2.0	< 2.0
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	18	< 10	< 10
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	44	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	56	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	64	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	120	< 10	< 10

Analytical Report Number: 18-18534

Project / Site name: 67 Syon Lane

Your Order No: PO 94131

Lab Sample Number	1092070			1092071			1092072		
Sample Reference	BH3			BH3			BH3		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	0.30-0.50			1.00-1.20			2.70-2.90		
Date Sampled	13/11/2018			13/11/2018			13/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

VOCs

Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	< 1.0	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	< 1.0	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-	-



Analytical Report Number: 18-18534

Project / Site name: 67 Syon Lane

Your Order No: PO 94131

Lab Sample Number				1092070	1092071	1092072		
Sample Reference				BH3	BH3	BH3		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.30-0.50	1.00-1.20	2.70-2.90		
Date Sampled				13/11/2018	13/11/2018	13/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

VOCs TICs

VOCs TICs Compound Name		N/A	NONE	0	-	-		
VOC % Match	%	N/A	NONE	0	-	-		
VOCs TICs Compound Name		N/A	NONE	0	-	-		
VOC % Match	%	N/A	NONE	0	-	-		
VOCs TICs Compound Name		N/A	NONE	0	-	-		
VOC % Match	%	N/A	NONE	0	-	-		
VOCs TICs Compound Name		N/A	NONE	0	-	-		
VOC % Match	%	N/A	NONE	0	-	-		
VOCs TICs Compound Name		N/A	NONE	0	-	-		
VOC % Match	%	N/A	NONE	0	-	-		
VOCs TICs Compound Name		N/A	NONE	0	-	-		
VOC % Match	%	N/A	NONE	0	-	-		
VOCs TICs Compound Name		N/A	NONE	0	-	-		
VOC % Match	%	N/A	NONE	0	-	-		
VOCs TICs Compound Name		N/A	NONE	0	-	-		
VOC % Match	%	N/A	NONE	0	-	-		

Analytical Report Number: 18-18534

Project / Site name: 67 Syon Lane

Your Order No: PO 94131

Lab Sample Number	1092070			1092071			1092072		
Sample Reference	BH3			BH3			BH3		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	0.30-0.50			1.00-1.20			2.70-2.90		
Date Sampled	13/11/2018			13/11/2018			13/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

SVOCs									
Compound	Units	Limit of detection	Accreditation Status	1092070	1092071	1092072			
Aniline	mg/kg	0.1	NONE	< 0.1	-	-			
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	-			
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-			
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	-			
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-			
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	-			
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-			
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	-			
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-			
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	-			
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-			
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	-			
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	-			
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	-			
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-			
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	-			
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-			
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-			
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	-			
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	-			
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	-			
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	-			
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-			
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	-			
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	-			
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	-			
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	-			
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	-			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-			
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	-			
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	-			
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	-			
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-			
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	-			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-			
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-			
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	-			
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-			
Phenanthrene	mg/kg	0.05	MCERTS	1.1	-	-			
Anthracene	mg/kg	0.05	MCERTS	0.19	-	-			
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	-			
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-			
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	-			
Fluoranthene	mg/kg	0.05	MCERTS	1.5	-	-			
Pyrene	mg/kg	0.05	MCERTS	1.4	-	-			
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	-			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.69	-	-			
Chrysene	mg/kg	0.05	MCERTS	0.61	-	-			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.66	-	-			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.28	-	-			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.52	-	-			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.26	-	-			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.34	-	-			



Analytical Report Number: 18-18534

Project / Site name: 67 Syon Lane

Your Order No: PO 94131

Lab Sample Number	1092070			1092071			1092072		
Sample Reference	BH3			BH3			BH3		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	0.30-0.50			1.00-1.20			2.70-2.90		
Date Sampled	13/11/2018			13/11/2018			13/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

SVOCs TICs

SVOCs TICs Compound Name	SVOC % Match	Units	Limit of detection	Accreditation Status	1092070	1092071	1092072		
Benzo[b]naphtho[2,1-d]thiophene		N/A	NONE		96	-	-		
Tridecane		N/A	NONE		95	-	-		
Pentadecane		N/A	NONE		95	-	-		
Z-11,13-Tetradecadien-1-ol acetate		N/A	NONE		95	-	-		
Benzo[e]pyrene		N/A	NONE		95	-	-		
3,5-Dimethyl-2-pyrrolo[2,3-d]carbazole-6-carboxylic acid, 1,2,3a,4,5,7-hexahydro-12-hydroxy-12-(1-hydroxyethyl)-, methyl ester		N/A	NONE		94	-	-		
Hexadecane, 2,6,10,14-tetramethyl-		N/A	NONE		93	-	-		
Dibenzothiophene		N/A	NONE		93	-	-		
		N/A	NONE		0	-	-		
		N/A	NONE		0	-	-		
		N/A	NONE		0	-	-		
		N/A	NONE		0	-	-		

Glycols

Compound Name	Units	Limit of detection	Accreditation Status	1092070	1092071	1092072		
1,2-Butanediol	mg/kg	10	NONE	< 10	-	-		
1,2-Propanediol	mg/kg	10	NONE	< 10	-	-		
1,3-Butanediol	mg/kg	10	NONE	< 10	-	-		
1,3-Propanediol	mg/kg	10	NONE	< 10	-	-		
1,4-Butanediol	mg/kg	10	NONE	< 10	-	-		
1,5-Pentanediol	mg/kg	10	NONE	< 10	-	-		
Diethylene Glycol	mg/kg	10	NONE	< 10	-	-		
Ethylene Glycol	mg/kg	10	NONE	< 10	-	-		
Triethylene Glycol	mg/kg	10	NONE	< 10	-	-		



Analytical Report Number: 18-18534
Project / Site name: 67 Syon Lane
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1092070	BH3	0.30-0.50	137	Loose Fibres	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



Analytical Report Number : 18-18534

Project / Site name: 67 Syon Lane

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1092070	BH3	None Supplied	0.30-0.50	Brown sand with rubble.
1092071	BH3	None Supplied	1.00-1.20	Light brown sand with gravel.
1092072	BH3	None Supplied	2.70-2.90	Brown clay.

Analytical Report Number : 18-18534

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Determination of glycols in soil by GC-MS.	Determination of glycols in soil by GC-MS.	In-house method	L059B-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Tentatively identified compounds (SVOC) in soil	Determination of semi-volatile organic compounds total ion count in soil by extraction with dichloromethane and hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L064-PL	D	NONE
Tentatively identified compounds (VOC) in soil	Determination of volatile organic compounds total ion count in soil by headspace GC-MS followed by a full library scan.	In-house method based on USEPA8260	L073-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Iss No 18-18534-2 67 Syon Lane WIE15238-100

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The results included within the report are representative of the samples submitted for analysis.

Page 10 of 11



Analytical Report Number : 18-18534

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



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Analytical Report Number : 18-18682

Project / Site name:	67 Syon Lane	Samples received on:	14/11/2018
Your job number:	WIE15238-100	Samples instructed on:	15/11/2018
Your order number:		Analysis completed by:	22/11/2018
Report Issue Number:	1	Report issued on:	22/11/2018
Samples Analysed:	3 soil samples		

Signed

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-18682

Project / Site name: 67 Syon Lane

Lab Sample Number	1092768	1092769	1092770			
Sample Reference	BH2	BH2	BH2			
Sample Number	None Supplied	None Supplied	None Supplied			
Depth (m)	0.50-0.70	1.00-1.20	3.80-4.00			
Date Sampled	14/11/2018	14/11/2018	14/11/2018			
Time Taken	None Supplied	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	5.3	6.7	18
Total mass of sample received	kg	0.001	NONE	2.0	1.9	1.6

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.9	8.6	7.9
Organic Matter	%	0.1	MCERTS	0.3	< 0.1	0.1

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-
Coronene	mg/kg	0.05	NONE	-	< 0.05	-

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	-	< 0.9	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	17	15
Barium (aqua regia extractable)	mg/kg	1	MCERTS	100	27	88
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.45	1.1	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	2.3	0.5	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	31	58
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	12	24
Lead (aqua regia extractable)	mg/kg	1	MCERTS	71	6.4	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.35	< 0.25	< 0.25
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	30	36
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	50	54	79
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	59	40	71

Analytical Report Number: 18-18682

Project / Site name: 67 Syon Lane

Lab Sample Number	1092768			1092769			1092770		
Sample Reference	BH2			BH2			BH2		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	0.50-0.70			1.00-1.20			3.80-4.00		
Date Sampled	14/11/2018			14/11/2018			14/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

Monoaromatics

Compound	Units	Limit of detection	Accreditation Status	1092768	1092769	1092770
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	8.6	< 2.0	< 2.0
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	23	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	45	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	78	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	78	< 10	< 10

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	19	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	31	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	31	< 10	< 10

Analytical Report Number: 18-18682
 Project / Site name: 67 Syon Lane

Lab Sample Number	1092768			1092769			1092770		
Sample Reference	BH2			BH2			BH2		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	0.50-0.70			1.00-1.20			3.80-4.00		
Date Sampled	14/11/2018			14/11/2018			14/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

VOCs

Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
Chloroethane	µg/kg	1	NONE	< 1.0	-	< 1.0		
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	< 1.0		
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	< 1.0		
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0		
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0		
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Styrene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Tribromomethane	µg/kg	1	NONE	< 1.0	-	< 1.0		
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	< 1.0		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0		



Analytical Report Number: 18-18682

Project / Site name: 67 Syon Lane

Lab Sample Number				1092768	1092769	1092770		
Sample Reference				BH2	BH2	BH2		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50-0.70	1.00-1.20	3.80-4.00		
Date Sampled				14/11/2018	14/11/2018	14/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

VOCs TICs

VOCs TICs Compound Name		N/A	NONE	0	-	0		
VOC % Match	%	N/A	NONE	0	-	0		
VOCs TICs Compound Name		N/A	NONE	0	-	0		
VOC % Match	%	N/A	NONE	0	-	0		
VOCs TICs Compound Name		N/A	NONE	0	-	0		
VOC % Match	%	N/A	NONE	0	-	0		
VOCs TICs Compound Name		N/A	NONE	0	-	0		
VOC % Match	%	N/A	NONE	0	-	0		
VOCs TICs Compound Name		N/A	NONE	0	-	0		
VOC % Match	%	N/A	NONE	0	-	0		
VOCs TICs Compound Name		N/A	NONE	0	-	0		
VOC % Match	%	N/A	NONE	0	-	0		
VOCs TICs Compound Name		N/A	NONE	0	-	0		
VOC % Match	%	N/A	NONE	0	-	0		
VOCs TICs Compound Name		N/A	NONE	0	-	0		
VOC % Match	%	N/A	NONE	0	-	0		

Analytical Report Number: 18-18682

Project / Site name: 67 Syon Lane

Lab Sample Number	1092768			1092769			1092770		
Sample Reference	BH2			BH2			BH2		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	0.50-0.70			1.00-1.20			3.80-4.00		
Date Sampled	14/11/2018			14/11/2018			14/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

SVOCs									
Compound	Units	Limit of detection	Accreditation Status	1092768	1092769	1092770			
Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1			
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2			
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1			
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1			
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1			
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2			
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1			
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1			
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1			
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1			
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1			
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1			
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1			
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3			
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
Phenanthrene	mg/kg	0.05	MCERTS	0.23	-	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2			
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3			
Fluoranthene	mg/kg	0.05	MCERTS	0.30	-	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	0.31	-	< 0.05			
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05			



Analytical Report Number: 18-18682

Project / Site name: 67 Syon Lane

Lab Sample Number				1092768	1092769	1092770		
Sample Reference				BH2	BH2	BH2		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50-0.70	1.00-1.20	3.80-4.00		
Date Sampled				14/11/2018	14/11/2018	14/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	0	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		
SVOCs TICs Compound Name		N/A	NONE	000	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		
SVOCs TICs Compound Name		N/A	NONE	0	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		
SVOCs TICs Compound Name		N/A	NONE	0	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		
SVOCs TICs Compound Name		N/A	NONE	00	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		
SVOCs TICs Compound Name		N/A	NONE	0	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		
SVOCs TICs Compound Name		N/A	NONE	0	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		
SVOCs TICs Compound Name		N/A	NONE	0	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		
SVOCs TICs Compound Name		N/A	NONE	0	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		
SVOCs TICs Compound Name		N/A	NONE	0	-	0		
SVOC % Match	%	N/A	NONE	0	-	0		

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-	< 0.001	-		
PCB Congener 52	mg/kg	0.001	MCERTS	-	< 0.001	-		
PCB Congener 101	mg/kg	0.001	MCERTS	-	< 0.001	-		
PCB Congener 118	mg/kg	0.001	MCERTS	-	< 0.001	-		
PCB Congener 138	mg/kg	0.001	MCERTS	-	< 0.001	-		
PCB Congener 153	mg/kg	0.001	MCERTS	-	< 0.001	-		
PCB Congener 180	mg/kg	0.001	MCERTS	-	< 0.001	-		

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	< 0.007	-		
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Analytical Report Number: 18-18682
Project / Site name: 67 Syon Lane
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1092768	BH2	0.50-0.70	140	Loose Fibres	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



Analytical Report Number : 18-18682

Project / Site name: 67 Syon Lane

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1092768	BH2	None Supplied	0.50-0.70	Light brown sandy clay with loam and gravel.
1092769	BH2	None Supplied	1.00-1.20	Brown sand with gravel.
1092770	BH2	None Supplied	3.80-4.00	Brown clay.

Analytical Report Number : 18-18682

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE

Analytical Report Number : 18-18682

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Tentatively identified compounds (SVOC) in soil	Determination of semi-volatile organic compounds total ion count in soil by extraction with dichloromethane and hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L064-PL	D	NONE
Tentatively identified compounds (VOC) in soil	Determination of volatile organic compounds total ion count in soil by headspace GC-MS followed by a full library scan.	In-house method based on USEPA8260	L073-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/cleanup.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



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Analytical Report Number : 18-19590

Project / Site name:	67 Syon Lane	Samples received on:	22/11/2018
Your job number:	WIE15238-100	Samples instructed on:	22/11/2018
Your order number:	94131	Analysis completed by:	29/11/2018
Report Issue Number:	1	Report issued on:	29/11/2018
Samples Analysed:	3 water samples		

Signed 

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-19590

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1097949			1097950			1097952		
Sample Reference	WS1			WS2			BH2		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	None Supplied			None Supplied			None Supplied		
Date Sampled	20/11/2018			20/11/2018			20/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status						

General Inorganics

Parameter	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952
pH	pH Units	N/A	ISO 17025	11.3	7.2	7.2
Sulphate as SO ₄	µg/l	45	ISO 17025	100000	203000	46800
Sulphate as SO ₄	mg/l	0.045	ISO 17025	100	203	46.8
Chloride	mg/l	0.15	ISO 17025	52	14	59
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	7.91	16.1	1.91
Nitrate as N	mg/l	0.01	ISO 17025	5.36	0.22	1.21
Nitrate as NO ₃	mg/l	0.05	ISO 17025	23.8	0.96	5.34
Hardness - Total	mgCaCO ₃ /l	1	ISO 17025	123	268	140

Speciated PAHs

Parameter	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	0.66	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	0.31	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	0.67	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	1.41	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	1.45	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	0.29	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	0.26	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01

Total PAH

Parameter	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	5.05	< 0.16



Analytical Report Number: 18-19590

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1097949			1097950			1097952		
Sample Reference	WS1			WS2			BH2		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	None Supplied			None Supplied			None Supplied		
Date Sampled	20/11/2018			20/11/2018			20/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status						

Heavy Metals / Metalloids

Parameter	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952		
Arsenic (total)	µg/l	0.15	ISO 17025	8.02	32.7	2.11		
Cadmium (total)	µg/l	0.02	ISO 17025	0.15	0.46	0.23		
Chromium (total)	µg/l	0.2	ISO 17025	10.2	14.8	2.6		
Barium (dissolved)	µg/l	0.06	ISO 17025	16	70	47		
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1		
Boron (dissolved)	µg/l	10	ISO 17025	32	99	22		
Calcium (dissolved)	mg/l	0.012	ISO 17025	49	89	43		
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0		
Cobalt (dissolved)	µg/l	0.2	ISO 17025	1.0	3.5	1.7		
Copper (dissolved)	µg/l	0.5	ISO 17025	5.5	1.3	0.6		
Lead (dissolved)	µg/l	0.2	ISO 17025	0.3	0.4	< 0.2		
Magnesium (dissolved)	mg/l	0.005	ISO 17025	0.041	11	8.0		
Manganese (dissolved)	µg/l	0.05	ISO 17025	1.2	630	860		
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05		
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	6.0	6.6	0.55		
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.9	4.5	2.1		
Selenium (dissolved)	µg/l	0.6	ISO 17025	22	2.7	2.3		
Vanadium (dissolved)	mg/l	0.0002	ISO 17025	0.0335	0.0007	< 0.0002		
Zinc (dissolved)	µg/l	0.5	ISO 17025	< 0.5	2.7	1.5		

Monoaromatics

Parameter	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952		
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		

Petroleum Hydrocarbons

Parameter	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952		
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	310	< 10		
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	590	< 10		
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	700	83		
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	350	470		
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	2000	550		
TPH-CWG - Aliphatic (C5 - C44)	µg/l	10	NONE	< 10	2000	550		

Parameter	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952		
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	170	< 10		
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	410	< 10		
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	340	< 10		
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	910	< 10		
TPH-CWG - Aromatic (C5 - C44)	µg/l	10	NONE	< 10	910	< 10		



Analytical Report Number: 18-19590

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1097949	1097950	1097952		
Sample Reference				WS1	WS2	BH2		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				20/11/2018	20/11/2018	20/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Analytical Parameter	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952		
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		



Analytical Report Number: 18-19590

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1097949	1097950	1097952		
Sample Reference				WS1	WS2	BH2		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				20/11/2018	20/11/2018	20/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs TICs

VOCs TICs Compound Name		10	NONE	ND	ND	ND		
VOC % Match	%	10	NONE	-	-	-		



Analytical Report Number: 18-19590

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1097949			1097950			1097952		
Sample Reference	WS1			WS2			BH2		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	None Supplied			None Supplied			None Supplied		
Date Sampled	20/11/2018			20/11/2018			20/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status						

SVOCs									
Analytical Parameter	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952			
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	0.66	< 0.01			
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	15	< 0.05			
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	0.31	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	0.67	< 0.01			
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	5.1	< 0.05			
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	1.4	< 0.01			
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	1.5	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01			
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	0.29	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	0.26	< 0.01			
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01			



Analytical Report Number: 18-19590

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number	1097949			1097950			1097952		
Sample Reference	WS1			WS2			BH2		
Sample Number	None Supplied			None Supplied			None Supplied		
Depth (m)	None Supplied			None Supplied			None Supplied		
Date Sampled	20/11/2018			20/11/2018			20/11/2018		
Time Taken	None Supplied			None Supplied			None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status						

SVOCs TICs

SVOCs TICs Compound Name	SVOC % Match	Units	Limit of detection	Accreditation Status	1097949	1097950	1097952		
Naphthalene, 1,6,7-trimethyl-	-	%	N/A	NONE	ND	98	94		
Cyclotetradecane, 1,7,11-trimethyl-4-(1-methylethyl)-	-								
Naphthalene, 1,4-dimethyl-	-	%	N/A	NONE	-	97	94		
(+)-5-(1-Acetoxy-1-methylethyl)-2-methyl-2-cyclohexen-1-one semicarbazone	-								
Naphthalene, 1,6-dimethyl-	-	%	N/A	NONE	-	97	93		
Naphthalene, 1,6,7-trimethyl-	-								
Naphthalene, 1,7-dimethyl-	-	%	N/A	NONE	-	97	92		
1-Nonadecene	-								
Naphthalene, 1,4,6-trimethyl-	-	%	N/A	NONE	-	97	91		
Pyridine-3-carboxamide, oxime, N-(2-trifluoromethylphenyl)-	-								
Hexadecane, 2,6,10,14-tetramethyl-	-	%	N/A	NONE	-	97	90		
Dodecane, 2,6,10-trimethyl-	-								
Naphthalene, 2,7-dimethyl-	-	%	N/A	NONE	-	96	90		
E,E,Z-1,3,12-Nonadecatriene-5,14-diol	-								
Nonane	-	%	N/A	NONE	-	95	-		
Benzene, 1,2,3-trimethyl-	-	%	N/A	NONE	-	95	-		
Benzene, 2-ethyl-1,4-dimethyl-	-	%	N/A	NONE	-	95	-		

PCBs by GC-MS

PCB Congener 28	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 52	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 101	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 118	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 138	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 153	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 180	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		

PCBs by GC-MS

Total PCBs	µg/l	0.14	NONE	< 0.14	< 0.14	< 0.14		
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 18-19590

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
PCB's By GC-MS in water	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L028-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025



Analytical Report Number : 18-19590

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Tentatively identified compounds (SVOC) in water	Determination of semi-volatile organic compounds total ion count in water by extraction with hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L070-PL	W	NONE
Tentatively identified compounds (VOC) in water	Determination of volatile organic compounds total ion count in water by headspace GC-MS followed by a full library scan.	In-house method based on USEPA8260	L073B-PL	W	NONE
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPH in (Water)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L070-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



Jon Coates

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Analytical Report Number : 18-20145

Project / Site name:	67 Syon Lane	Samples received on:	22/11/2018
Your job number:	WIE15238-100	Samples instructed on:	27/11/2018
Your order number:	94131	Analysis completed by:	03/12/2018
Report Issue Number:	1	Report issued on:	03/12/2018
Samples Analysed:	1 leachate sample		

Signed 

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-20145

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1101451				
Sample Reference				BH1				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				21/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	9.4				
Sulphate as SO ₄	mg/l	0.1	ISO 17025	82.3				
Chloride	mg/l	0.15	ISO 17025	6.1				
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	9.62				
Nitrate as N	mg/l	0.01	NONE	0.13				
Nitrate as NO ₃	mg/l	0.05	NONE	0.56				
Hardness - Total	mgCaCO ₃ /l	1	NONE	12.4				



Analytical Report Number: 18-20145

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1101451				
Sample Reference				BH1				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				21/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1.1	ISO 17025	12				
Barium (dissolved)	µg/l	0.05	ISO 17025	7.9				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	44				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.7				
Cobalt (dissolved)	µg/l	0.3	ISO 17025	1.3				
Copper (dissolved)	µg/l	0.7	ISO 17025	3.8				
Lead (dissolved)	µg/l	1	ISO 17025	1.3				
Manganese (dissolved)	µg/l	0.06	ISO 17025	2.7				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	5.4				
Nickel (dissolved)	µg/l	0.3	ISO 17025	4.2				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	33				
Zinc (dissolved)	µg/l	0.4	ISO 17025	< 0.4				

Calcium (dissolved)	mg/l	0.012	ISO 17025	3.3				
Magnesium (dissolved)	mg/l	0.005	ISO 17025	1.0				



Analytical Report Number: 18-20145

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1101451				
Sample Reference				BH1				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				21/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C44)	µg/l	10	NONE	< 10				

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C44)	µg/l	10	NONE	< 10				



Analytical Report Number: 18-20145

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1101451				
Sample Reference				BH1				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				21/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	NONE	< 1.0				
Chloroethane	µg/l	1	NONE	< 1.0				
Bromomethane	µg/l	1	NONE	< 1.0				
Vinyl Chloride	µg/l	1	NONE	< 1.0				
1,1-dichloroethene	µg/l	1	NONE	< 1.0				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	NONE	< 1.0				
Cis-1,2-dichloroethene	µg/l	1	NONE	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	NONE	< 1.0				
1,1-dichloroethane	µg/l	1	NONE	< 1.0				
2,2-Dichloropropane	µg/l	1	NONE	< 1.0				
Trichloromethane	µg/l	1	NONE	< 1.0				
1,1,1-Trichloroethane	µg/l	1	NONE	< 1.0				
1,2-dichloroethane	µg/l	1	NONE	< 1.0				
1,1-Dichloropropene	µg/l	1	NONE	< 1.0				
Trans-1,2-dichloroethene	µg/l	1	NONE	< 1.0				
Benzene	µg/l	1	ISO 17025	< 1.0				
Tetrachloromethane	µg/l	1	NONE	< 1.0				
1,2-dichloropropane	µg/l	1	NONE	< 1.0				
Trichloroethene	µg/l	1	NONE	< 1.0				
Dibromomethane	µg/l	1	NONE	< 1.0				
Bromodichloromethane	µg/l	1	NONE	< 1.0				
Cis-1,3-dichloropropene	µg/l	1	NONE	< 1.0				
Trans-1,3-dichloropropene	µg/l	1	NONE	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloroethane	µg/l	1	NONE	< 1.0				
1,3-Dichloropropane	µg/l	1	NONE	< 1.0				
Dibromochloromethane	µg/l	1	NONE	< 1.0				
Tetrachloroethene	µg/l	1	NONE	< 1.0				
1,2-Dibromoethane	µg/l	1	NONE	< 1.0				
Chlorobenzene	µg/l	1	NONE	< 1.0				
1,1,1,2-Tetrachloroethane	µg/l	1	NONE	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
Styrene	µg/l	1	NONE	< 1.0				
Tribromomethane	µg/l	1	NONE	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
1,1,2,2-Tetrachloroethane	µg/l	1	NONE	< 1.0				
Isopropylbenzene	µg/l	1	NONE	< 1.0				
Bromobenzene	µg/l	1	NONE	< 1.0				
N-Propylbenzene	µg/l	1	NONE	< 1.0				
2-Chlorotoluene	µg/l	1	NONE	< 1.0				
4-Chlorotoluene	µg/l	1	NONE	< 1.0				
1,3,5-Trimethylbenzene	µg/l	1	NONE	< 1.0				
Tert-Butylbenzene	µg/l	1	NONE	< 1.0				
1,2,4-Trimethylbenzene	µg/l	1	NONE	< 1.0				
Sec-Butylbenzene	µg/l	1	NONE	< 1.0				
1,3-dichlorobenzene	µg/l	1	NONE	< 1.0				
P-Isopropyltoluene	µg/l	1	NONE	< 1.0				
1,2-dichlorobenzene	µg/l	1	NONE	< 1.0				
1,4-dichlorobenzene	µg/l	1	NONE	< 1.0				
Butylbenzene	µg/l	1	NONE	< 1.0				
1,2-Dibromo-3-chloropropane	µg/l	1	NONE	< 1.0				
1,2,4-Trichlorobenzene	µg/l	1	NONE	< 1.0				
Hexachlorobutadiene	µg/l	0.1	NONE	< 0.1				
1,2,3-Trichlorobenzene	µg/l	1	NONE	< 1.0				



Analytical Report Number: 18-20145

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1101451				
Sample Reference				BH1				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				21/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

VOCs TICs

VOC TICs Compound Name		10	NONE	ND				
VOC TICs Compound % Match	%	10	NONE	-				



Analytical Report Number: 18-20145
 Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1101451				
Sample Reference				BH1				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				21/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs								
Analytical Parameter	Units	Limit of detection	Accreditation Status	Result				
Aniline	µg/l	0.05	NONE	< 0.05				
Phenol	µg/l	0.05	NONE	< 0.05				
2-Chlorophenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05				
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05				
2-Methylphenol	µg/l	0.05	NONE	< 0.05				
Hexachloroethane	µg/l	0.05	NONE	< 0.05				
Nitrobenzene	µg/l	0.05	NONE	< 0.05				
4-Methylphenol	µg/l	0.05	NONE	< 0.05				
Isophorone	µg/l	0.05	NONE	< 0.05				
2-Nitrophenol	µg/l	0.05	NONE	< 0.05				
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05				
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05				
Naphthalene	µg/l	0.01	NONE	< 0.01				
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05				
4-Chloroaniline	µg/l	0.05	NONE	< 0.05				
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05				
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05				
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05				
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05				
Dimethylphthalate	µg/l	0.05	NONE	< 0.05				
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Acenaphthylene	µg/l	0.01	NONE	< 0.01				
Acenaphthene	µg/l	0.01	NONE	< 0.01				
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Dibenzofuran	µg/l	0.05	NONE	< 0.05				
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Diethyl phthalate	µg/l	0.05	NONE	< 0.05				
4-Nitroaniline	µg/l	0.05	NONE	< 0.05				
Fluorene	µg/l	0.01	NONE	< 0.01				
Azobenzene	µg/l	0.05	NONE	< 0.05				
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02				
Phenanthrene	µg/l	0.01	NONE	< 0.01				
Anthracene	µg/l	0.01	NONE	< 0.01				
Carbazole	µg/l	0.05	NONE	< 0.05				
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05				
Anthraquinone	µg/l	0.05	NONE	< 0.05				
Fluoranthene	µg/l	0.01	NONE	< 0.01				
Pyrene	µg/l	0.01	NONE	< 0.01				
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05				
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01				
Chrysene	µg/l	0.01	NONE	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01				
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				



Analytical Report Number: 18-20145

Project / Site name: 67 Syon Lane

Your Order No: 94131

Lab Sample Number				1101451				
Sample Reference				BH1				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				21/11/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs TICs

SVOC TICs Compound Name		N/A	NONE	ND				
SVOC TICs Compound % Match	%	N/A	NONE	-				

PCBs by GC-MS

PCB Congener 28	µg/l	0.05	NONE	< 0.05				
PCB Congener 52	µg/l	0.05	NONE	< 0.05				
PCB Congener 101	µg/l	0.02	NONE	< 0.02				
PCB Congener 118	µg/l	0.05	NONE	< 0.05				
PCB Congener 138	µg/l	0.05	NONE	< 0.05				
PCB Congener 153	µg/l	0.05	NONE	< 0.05				
PCB Congener 180	µg/l	0.05	NONE	< 0.05				

PCBs by GC-MS

Total PCBs	µg/l	0.4	NONE	< 0.40				
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Analytical Report Number : 18-20145

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved Organic Carbon in leachate	Determination of dissolved organic carbon in leachate by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L023-PL	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	NONE
PCB's By GC-MS in leachate	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L028-UK	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Semi-volatile organic compounds in leachate	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025



Analytical Report Number : 18-20145

Project / Site name: 67 Syon Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Tentatively identified compounds (SVOC) in leachate	Determination of semi-volatile organic compounds total ion count in leachate by extraction with hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L070-PL	W	NONE
Tentatively identified compounds (VOC) in leachate	Determination of volatile organic compounds total ion count in water by headspace GC-MS followed by a full library scan.	In-house method based on USEPA8260	L036-UK	W	NONE
Total Hardness of leachates	Determination of hardness in leachates by calculation from calcium and magnesium.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	NONE
TPH in (Leachate)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method, TPH with carbon banding.	L070-PL	W	NONE
TPH7 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA8260	L073B-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Appendix G Risk Rating Matrix

Table G.1: Risk rating for contaminated land qualitative risk assessment

Level of Severity	Likelihood		
	Most Likely	Reasonably Foreseeable	Unlikely
Acute harm or severe chronic harm. Direct pollution of sensitive water receptors or serious pollution of other water bodies.	High	High	Low
Harm from long-term exposure. Slight pollution of sensitive receptors or pollution of other water bodies.	Medium	Medium	Low
No significant harm in either short or long term. No pollution of water that is likely to affect sensitive receptors. No more than slight pollution of other water bodies.	Low	Low	Low

Appendix H Environmental Receptors

The Contaminated Land Statutory Guidance has a four category system that considers harm to human health, controlled waters, flora and fauna, property, livestock and crops. The Categories are broadly defined as follows:

- 1 Contaminated Land – similar to land where it is known that significant harm has been caused or significant harm is being caused
- 2 Contaminated Land – no significant harm being caused but there is a significant possibility for significant harm to be caused in the future
- 3 Not Contaminated Land – there may be harm being caused but no significant possibility for significant harm to be caused in the future
- 4 Not Contaminated Land – no contaminant linkage, normal levels of contaminants and no significant harm being caused and no significant possibility for significant harm to be caused in the future.

Table H.1: Significant pollution to controlled waters

Pollution of controlled waters

Under Section 78A(9) of Part 2A the term “pollution of controlled waters means the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter. The term “controlled waters” in relation to England has the same meaning as in Part 3 of the Water Resources Act 1991, except that “ground waters” does not include water contained in underground strata but above the saturation zones. (Paragraph 4.36)

Given that the Part 2A regime seeks to identify and deal with significant pollution (rather than lesser levels of pollution), the local authority should seek to focus on pollution which: (i) may be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems; (ii) which may result in damage to material property; or (iii) which may impair or interfere with amenities and other legitimate uses of the environment. (Paragraph 4.37)

Significant pollution of controlled waters

Paragraph 4.38 states that “The following types of pollution should be considered to constitute significant pollution of controlled waters:

- (a) Pollution equivalent to “environmental damage” to surface water or groundwater as defined by The Environmental Damage (Prevention and Remediation) Regulations 2009, but which cannot be dealt with under those Regulations.
- (b) Inputs resulting in deterioration of the quality of water abstracted, or intended to be used in the future, for human consumption such that additional treatment would be required to enable that use.
- (c) A breach of a statutory surface water Environment Quality Standard, either directly or via a groundwater pathway.
- (d) Input of a substance into groundwater resulting in a significant and sustained upward trend in concentration of contaminants (as defined in Article 2(3) of the Groundwater Daughter Directive (2006/118/EC)5”.

Paragraph 4.39 states that “In some circumstances, the local authority may consider that the following types of pollution may constitute significant pollution: (a) significant concentrations⁶ of hazardous substances or non-hazardous pollutants in groundwater; or (b) significant concentrations of priority hazardous substances, priority substances or other specific polluting substances in surface water; at an appropriate, risk based compliance point. The local authority should only conclude that pollution is significant if it considers that treating the land as contaminated land would be in accordance with the broad objectives of the regime as described in Section 1 (of the Contaminated Land Statutory Guidance). This would normally mean that the authority should conclude that less serious forms of pollution are not significant. In such cases the authority should consult the Environment Agency”.

The following types of circumstance should not be considered to be contaminated land on water pollution grounds:

- (a) The fact that substances are merely entering water and none of the conditions for considering that significant pollution is being caused set out in paragraphs 4.38 and 4.39 above are being met.
- (b) The fact that land is causing a discharge that is not discernible at a location immediately downstream or down-gradient of the land (when compared to upstream or up-gradient concentrations).
- (c) Substances entering water in compliance with a discharge authorised under the Environmental Permitting Regulations.

Significant pollution of controlled waters is being caused

In deciding whether significant pollution of controlled waters is being caused, the local authority should consider that this test is only met where it is satisfied that the substances in question are continuing to enter controlled waters; or that they have already entered the waters and are likely to do so again in such a manner that past and likely future entry in effect constitutes ongoing pollution. For these purposes, the local authority should:

- (a) Regard substances as having entered controlled waters where they are dissolved or suspended in those waters, or (if they are immiscible with water) they have direct contact with those waters on or beneath the surface of the water.
- (b) Take the term “continuing to enter” to mean any measurable entry of the substance(s) into controlled waters additional to any which has already occurred.
- (c) Take the term “likely to do so again” to mean more likely than not to occur again.

Land should not be determined as contaminated land on grounds that significant pollution of controlled waters is being caused where: (a) the relevant substance(s) are already present in controlled waters; (b) entry into controlled waters of the substance(s) from land has ceased; and (c) it is not likely that further entry will take place.

Significant Possibility of Significant Pollution of Controlled Waters

In deciding whether or not a significant possibility of significant pollution of controlled waters exists, the local authority should first understand the possibility of significant pollution of controlled waters posed by the land, and the levels of certainty/uncertainty attached to that understanding, before it goes on to decide whether or not that possibility is significant. The term “possibility of significant pollution of controlled waters” means the estimated likelihood that significant pollution of controlled waters might occur. In assessing the possibility of significant pollution of controlled waters from land, the local authority should act in accordance with the advice on risk assessment in Section 3 and the guidance in this sub-section.

In deciding whether the possibility of significant pollution of controlled waters is significant the local authority should bear in mind that Part 2A makes the decision a positive legal test. In other words, for particular land to meet the test the authority needs reasonably to believe that there is a significant possibility of such pollution, rather than to demonstrate that there is not.

Before making its decision on whether a given possibility of significant pollution of controlled waters is significant, the local authority should consider:

- (a) The estimated likelihood that the potential significant pollution of controlled waters would become manifest; the strength of evidence underlying the estimate; and the level of uncertainty underlying the estimate.
- (b) The estimated impact of the potential significant pollution if it did occur. This should include consideration of whether the pollution would be likely to cause a breach of European water legislation, or make a major contribution to such a breach.
- (c) The estimated timescale over which the significant pollution might become manifest.
- (d) The authority's initial estimate of whether remediation is feasible, and if so what it would involve and the extent to which it might provide a solution to the problem; how long it would take; what benefit it would be likely to bring; and whether the benefits would outweigh the costs and any impacts on local society or the environment from taking action

Reproduced from DEFRA (2012) Contaminated Land Statutory Guidance pursuant to section 78YA of the Environmental Protection Act 1990 as amended by Section 57 of the Environment Act 1995.

Table H.2: Significant harm to human health, ecological systems and property

Relevant types of receptor	Significant harm	Significant possibility of significant harm
Human beings	<p>The following health effects should always be considered to constitute significant harm to human health: death; life threatening diseases (eg cancers); other diseases likely to have serious impacts on health; serious injury; birth defects; and impairment of reproductive functions.</p> <p>Other health effects may be considered by the local authority to constitute significant harm. For example, a wide range of conditions may or may not constitute significant harm (alone or in combination) including: physical injury; gastrointestinal disturbances; respiratory tract effects; cardio-vascular effects; central nervous system effects; skin ailments; effects on organs such as the liver or kidneys; or a wide range of other health impacts. In deciding whether or not a particular form of harm is significant harm, the local authority should consider the seriousness of the</p>	<p>The risk posed by one or more relevant contaminant linkage(s) relating to the land comprises:</p> <ul style="list-style-type: none"> (a) The estimated likelihood that significant harm might occur to an identified receptor, taking account of the current use of the land in question. (b) The estimated impact if the significant harm did occur – i.e. the nature of the harm, the seriousness of the harm to any person who might suffer it, and (where relevant) the extent of the harm in terms of how many people might suffer it. <p>In estimating the likelihood that a specific form of significant harm might occur the local authority should, among other things, consider:</p> <ul style="list-style-type: none"> (a) The estimated probability that

Relevant types of receptor	Significant harm	Significant possibility of significant harm
	<p>harm in question: including the impact on the health, and quality of life, of any person suffering the harm; and the scale of the harm. The authority should only conclude that harm is significant if it considers that treating the land as contaminated land would be in accordance with the broad objectives of the regime as described in Section 1 of the Contaminated Land Statutory Guidance.</p>	<p>the significant harm might occur:</p> <p>(i) if the land continues to be used as it is currently being used; and</p> <p>(ii) where relevant, if the land were to be used in a different way (or ways) in the future having regard to the guidance on “current use” in Section 3 of the Contaminated Land Statutory Guidance.</p> <p>(b) The strength of evidence underlying the risk estimate. It should also consider the key assumptions on which the estimate of likelihood is based, and the level of uncertainty underlying the estimate.</p>
<p>Any ecological system, or living organism forming part of such a system, within a location which is:</p> <ul style="list-style-type: none"> • a site of special scientific interest (under section 28 of the Wildlife and Countryside Act (WCA) 1981 (as amended) and Part 4 of the Natural Environment and Rural Communities Act 2006 (as amended)); • a national nature reserve (under Section 35 of the WCA 1981 (as amended)); • a marine nature reserve (under Section 36 of the WCA 1981 (as amended)); • an area of special protection for birds (under Section 3 of the WCA 1981 (as amended)); • a “European site” within the meaning of regulation 8 of the Conservation of Habitats and Species Regulations 2010 (as amended); • any habitat or site afforded policy protection under Section 15 of The National Planning Policy Framework (NPPF) on conserving and enhancing the natural environment (i.e. possible Special Areas of Conservation, potential Special 	<p>The following types of harm should be considered to be significant harm:</p> <ul style="list-style-type: none"> • harm which results in an irreversible adverse change, or in some other substantial adverse change, in the functioning of the ecological system within any substantial part of that location; or • harm which significantly affects any species of special interest within that location and which endangers the long-term maintenance of the population of that species at that location. <p>In the case of European sites, harm should also be considered to be significant harm if it endangers the favourable conservation status of natural habitats at such locations or species typically found there. In deciding what constitutes such harm, the local authority should have regard to the advice of Natural England and to the requirements of the Conservation of Habitats and Species Regulations 2010 (as amended).</p>	<p>Conditions would exist for considering that a significant possibility of significant harm exists to a relevant ecological receptor where the local authority considers that:</p> <ul style="list-style-type: none"> • significant harm of that description is more likely than not to result from the contaminant linkage in question; or • there is a reasonable possibility of significant harm of that description being caused, and if that harm were to occur, it would result in such a degree of damage to features of special interest at the location in question that they would be beyond any practicable possibility of restoration. <p>Any assessment made for these purposes should take into account relevant information for that type of contaminant linkage, particularly in relation to the ecotoxicological effects of the contaminant.</p>

Relevant types of receptor	Significant harm	Significant possibility of significant harm
<p>Protection Areas and listed or proposed Ramsar sites); or</p> <ul style="list-style-type: none"> • any nature reserve established under Section 21 of the National Parks and Access to the Countryside Act 1949. 		
<p>Property in the form of:</p> <ul style="list-style-type: none"> • crops, including timber • produce grown domestically, or on allotments, for consumption • livestock • other owned or domesticated animals; • wild animals which are the subject of shooting or fishing rights. 	<p>For crops, a substantial diminution in yield or other substantial loss in their value resulting from death, disease or other physical damage. For domestic pets, death, serious disease or serious physical damage. For other property in this category, a substantial loss in its value resulting from death, disease or other serious physical damage.</p> <p>The local authority should regard a substantial loss in value as occurring only when a substantial proportion of the animals or crops are dead or otherwise no longer fit for their intended purpose. Food should be regarded as being no longer fit for purpose when it fails to comply with the provisions of the Food Safety Act 1990. Where a diminution in yield or loss in value is caused by a contaminant linkage, a 20% diminution or loss should be regarded as a benchmark for what constitutes a substantial diminution or loss. In the Guidance states that this description of significant harm is referred to as an “animal or crop effect”.</p>	<p>Conditions would exist for considering that a significant possibility of significant harm exists to the relevant types of receptor where the local authority considers that significant harm is more likely than not to result from the contaminant linkage in question, taking into account relevant information for that type of contaminant linkage, particularly in relation to the ecotoxicological effects of the contaminant.</p>
<p>Property in the form of buildings. For this purpose 'building' means any structure or erection and any part of a building, including any part below ground level, but does not include plant or machinery comprised in a building, or buried services such as sewers, water pipes or electricity cables.</p>	<p>Structural failure, substantial damage or substantial interference with any right of occupation. The local authority should regard substantial damage or substantial interference as occurring when any part of the building ceases to be capable of being used for the purpose for which it is or was intended.</p> <p>In the case of a scheduled Ancient Monument, substantial damage should be regarded as occurring when the damage significantly impairs the historic, architectural, traditional, artistic or archaeological interest by reason of which the monument was scheduled.</p>	<p>Conditions would exist for considering that a significant possibility of significant harm exists to the relevant types of receptor where the local authority considers that significant harm is more likely than not to result from the contaminant linkage in question during the expected economic life of the building (or in the case of a scheduled Ancient Monument the foreseeable future), taking into account relevant information for that type of contaminant linkage.</p>

Relevant types of receptor	Significant harm	Significant possibility of significant harm
	The Guidance states that this description of significant harm is referred to as a 'building effect'.	

Reproduced from DEFRA (2012) Contaminated Land Statutory Guidance pursuant to section 78YA of the Environmental Protection Act 1990 as amended by Section 57 of the Environment Act 1995.

Appendix I Generic Assessment Criteria

Human Health Generic Assessment Criteria

Background

In order to be able to make inference on whether the results obtained during the site investigation (e.g. chemical concentrations in soils, waters and gas) point to the presence of a potential hazard to human health, it is necessary to distinguish between the results, reflecting background and/or insignificantly elevated levels of contamination (i.e. with negligible potential to cause harm or pollution) and the results with significantly elevated concentrations (i.e. with significant potential to cause harm or pollution).

The approach to risk assessment with respect to risks to human health from contaminated land in the UK is set out in the publication Model Procedures for the Management of Land Contamination (CLR11) Environment Agency (2004).

This sets out a tiered approach:

- Preliminary Risk Assessment (e.g. establishing potential contaminant linkages);
- Generic Quantitative Risk Assessment (GQRA) (e.g. comparison of site contaminant concentrations against generic standards and compliance criteria e.g. Soil Guideline Values (SGV) or other Generic Assessment Criteria including an assessment of risk using the source pathway target model); and
- Detailed Quantitative Risk Assessment (DQRA) (e.g. the comparison of contaminant concentrations against site specific assessment criteria).

Preliminary Risk Assessment

This typically encompasses a desk based generation of a conceptual model to establish the potential contaminant linkages associated with the site and any proposed development. Works would typically involve:

- Evaluation of the potential sources of contamination on the site and in the locality and from both a current and historical perspective
- Statutory Consultation;
- Evaluation of a sites geology, hydrology and hydrogeology;
- Site inspection;
- Additional pertinent information as necessary on a site by site basis.

Where works indicate the presence of a potential contaminant linkage further evaluation and potentially site investigation works are necessary to determine the significance of the linkage.

Generic Quantitative Risk Assessment (GQRA)

In August 2008 the Environment Agency (EA) and Department of Environment Food and Rural Affairs (DEFRA) announced the withdrawal of the Contaminated Land Reports CLR7 – 10, CLEA UK (beta) and existing SGV reports as they no-longer fully reflected the revised approach to human health risk assessment.

New partial guidance (in particular Science Reports SR2, SR3 and SR7) and new risk assessment tools (CLEA model version v1.04, v1.05 and currently v1.06) were published in 2009 and these allow environmental practitioners to derive generic and site specific Soil Assessment Criteria (GAC and SAC).

Soil Guideline Values (SGVs)

The EA and DEFRA updated the TOX reports and Soil Guideline Values (SGVs) to reflect the guidance documents published in 2009. SGVs for arsenic, cadmium, nickel, selenium, BTEX compounds (benzene, toluene, ethylbenzene and xylenes), dioxins, furans and dioxin like PCBs and phenol have been made available.

Since publishing the revised SGVs the CLEA model was updated to version v1.06. The Environment Agency has however confirmed that v1.05 has only a “minor effect on assessment criteria calculated using the CLEA software 1.04” and consequently the GACs derived are considered to remain valid. Environment Agency SGVs generated using v1.04 have also not been updated. Software version v1.06 is identical to v1.05 with some password protection enhancements that in no way affect the GAC values generated.

Owing to the scientific advances since 2009 and in particular toxicological research outputs, less significance is now placed on the SGVs in the hierarchy outlined below.

Category 4 Screening Levels (C4SLs)

Category 4 Screening Levels were generated by Contaminated Land: Applications in Real Environments (CL:AIRE) on behalf of DEFRA and made available to the public in April 2014. Category 4 Screening Levels were derived in response to policy changes outlined in the recently revised Statutory Guidance (SG) for Part 2A of the Environmental Protection Act 1990 (Part 2A). Part 2A was originally introduced to ensure that the risks from land contamination to human health, property and the environment are managed appropriately, with the revised SG being designed to address concerns regarding its real-world application. The revised SG presents a new four category system for classifying land under Part 2A, ranging from Category 4, where the level of risk posed is acceptably low, to Category 1, where the level of risk is clearly unacceptable.

The document SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document (March 2014) states that:

The Impact Assessment that accompanied the revised Part 2A Statutory Guidance identified a potential role for new ‘Category 4 Screening Levels’ in providing a simple test for deciding when land is suitable for use and definitely not contaminated land. It was envisaged that these new screening levels would allow ‘low-risk’ land to be dismissed from the need for further risk assessment more quickly and easily and allow regulators to focus efforts on the highest-risk land. The C4SLs were proposed to be more pragmatic (whilst still strongly precautionary) compared to existing generic screening levels. It is anticipated that, where they exist, C4SLs will be used as generic screening criteria that can be used within a GQRA, albeit describing a higher level of risk than the currently or previously available SGVs.

Suitable For Use Screening Levels (S4USLs)

In January 2015, Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH) have published updated screening criteria that were derived in line with UK guidance on risk assessment (SR2 and SR3). The resultant screening criteria reflect the industries greater knowledge of the relevant toxicology and further consideration of exposure scenarios as set out in SP1010.

Waterman's Generic Assessment Criteria (GACs)

Waterman have used the following hierarchy for the generic assessment of soils to evaluate Human Health.

- Published Category 4 Screening Values (C4SLs) derived by CL:AIRE on behalf of DEFRA; or in their absence;
- Suitable 4 Use Screening Levels (S4USLs) derived by LQM/CIEH; or in their absence;
- Published Soil Guideline Values (SGVs);
- GAC prepared in accordance with the CLEA v1.04 / v1.06 model by authoritative bodies (e.g. Contaminated Land Applications in Real Environments (CL:AIRE) 2009; and
- Waterman in-house GAC prepared in accordance with the CLEA V1.06 model and associated documents.

Tabulated values of the GACs used are presented overleaf. The references of the sources quoted in the table are:-

- Environment Agency, 2009. CLEA Software, version 1.06;
- DEFRA, Environment Agency, 2004. Model Procedures for the Management of Land Contamination, Contaminated Land Report 11;
- DEFRA, 2014, SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document and appendices;
- LQM / CIEH, 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment;
- Environment Agency, 2009. Human health toxicological assessment of contaminants in soil. Report SC050021/SR2;
- Environment Agency, 2009. Updated technical background to the CLEA model. Report SC050021/SR3;
- Environment Agency, 2008. Compilation of chemical data for priority organic pollutants for derivation of Soil Guideline Values. Report SC050021/SR7; and
- EIC / CL:AIRE, 2010. Soil generic assessment criteria for human health risk assessment.

Detailed Quantitative Risk Assessment (DQRA)

Detailed Quantitative Risk Assessments are undertaken on a site specific basis and full details of the alterations to the CLEA model and generic land use scenarios will be described within the specific reports.

Benzo(a)pyrene Surrogate Marker (SM) Approach

The DEFRA Category 4 Screening Level for B(a)P is based on the surrogate marker approach. In order to utilise the GAC or others based on this approach, the sample assessed must exhibit certain properties that comply with underlying assumptions.

SP1010, Appendix E states:

“The SM approach estimates the toxicity of a mixture of PAHs in an environmental matrix by using toxicity data for a PAH mixture for which the composition is known. Exposure to the SM is assumed to represent

exposure to all PAHs in that matrix therefore the toxicity of the SM represents the toxicity of the mixture. In most cases, BaP is chosen as the SM due to its ubiquitous nature and the vast amount of data available and has been used by various authoritative bodies to assess the carcinogenic risk of PAHs in food (EFSA 2008). However, RIVM considered that 'it would not be suitable to use BaP as a SM for carcinogenic risk assessment of PAH mixtures in soil due to the wide variety in composition of PAH mixtures in Dutch land contamination sites', although little data was provided in the report to support this statement (RIVM 2001). Similarly, the Canadian Council of Ministers of the Environment (CCME) also stated that contaminated soil is likely to contain a diverse range of carcinogenic and non-carcinogenic PAH of varying potency (CCME, 2008).

The SM approach relies on a number of assumptions (HPA 2010).

- The SM (BaP) must be present in all soil samples.
- The profile of the different PAH relative to BaP should be similar in all samples.
- The PAH profile in the soil samples should be similar to that used in the pivotal toxicity study on which HBGV was based i.e. the Culp study.

[sic] To assess the PAH profile in the test soil sample [complies with the assumptions above], the ratio of the seven genotoxic PAHs (benz[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[g,h,i]perylene, chrysene, dibenz[a,h]anthracene and indeno[1,2,3-c,d]pyrene), relative to BaP, should be calculated to ensure it is similar to the test material used in the Culp study (HPA 2010). To be considered sufficiently similar, the ratio relative to BaP should fit within the upper and lower limits (representing an order of magnitude above and below the mean ratio to BaP of test material used in the Culp study). In such cases BaP is considered an adequate SM and the LLTC for BaP may be used in the risk assessment.

If the site falls outside the order of magnitude limits, it may be appropriate to considering a LLTC for groups of surrogate markers, such as groups of 2, 4 or 8 PAHs, as used by EFSA for the evaluation of PAHs in food (EFSA 2008). Expert judgement should be sought in such situations where there is uncertainty as to whether BaP is sufficiently representative (HPA 2010)."

The ratios of the seven genotoxic PAHs relative to B(a)P can be calculated 'by hand' or using LQM's PAH profiling tool.

Generic Quantitative Risk Assessment Criteria – Residential end-use without plant uptake

Proposed End Use	units	Residential without plant uptake			Source
		1	2.5	6	
Soil Organic Matter Content	%	1	2.5	6	
Arsenic	mg/kg	40	40	40	DEFRA C4SLs
Antimony	mg/kg	550	550	550	CL:AIRE 2009
Barium	mg/kg	1300	1300	1300	CL:AIRE 2009
Beryllium	mg/kg	1.7	1.7	1.7	LQM S4ULs 2015
Boron (Water Soluble)	mg/kg	11000	11000	11000	LQM S4ULs 2015
Cadmium	mg/kg	150	150	150	DEFRA C4SLs
Chromium (Total)	mg/kg	910	910	910	LQM S4ULs 2015
Chromium (VI)	mg/kg	21	21	21	DEFRA C4SLs
Copper	mg/kg	7100	7100	7100	LQM S4ULs 2015
Lead	mg/kg	310	310	310	DEFRA C4SLs
Mercury	mg/kg	1.2	1.2	1.2	LQM S4ULs 2015
Molybdenum	mg/kg	670	670	670	CL:AIRE 2009
Nickel	mg/kg	180	180	180	LQM S4ULs 2015
Selenium	mg/kg	430	430	430	LQM S4ULs 2015
Vanadium*	mg/kg	1200	1200	1200	LQM S4ULs 2015
Zinc	mg/kg	40000	40000	40000	LQM S4ULs 2015
Cyanide (Free)	mg/kg				Waterman GAC - CLEA v1.06
Complex Cyanide	mg/kg				Waterman GAC - CLEA v1.06

Proposed End Use	units	Residential without plant uptake			Source
		1	2.5	6	
Soil Organic Matter Content	%	1	2.5	6	
Thiocyanate	mg/kg				Waterman GAC - CLEA v1.06
Aliphatic EC5 - EC6	mg/kg	42	78	160	LQM S4ULs 2015
Aliphatic EC6 - EC8	mg/kg	100	230	530	LQM S4ULs 2015
Aliphatic EC8-EC10	mg/kg	27	65	150	LQM S4ULs 2015
Aliphatic EC10-EC12	mg/kg	130	330	770	LQM S4ULs 2015
Aliphatic EC12-EC16	mg/kg	1100	2400	4400	LQM S4ULs 2015
Aliphatic EC16-EC35	mg/kg	65000	92000	110000	LQM S4ULs 2015
Aliphatic EC35-EC44	mg/kg	65000	92000	110000	LQM S4ULs 2015
Aromatic C5-C7	mg/kg	370	690	1400	LQM S4ULs 2015
Aromatic C7-C8	mg/kg	860	1800	3900	LQM S4ULs 2015
Aromatic C8-C10	mg/kg	47	110	270	LQM S4ULs 2015
Aromatic C10-C12	mg/kg	250	590	1200	LQM S4ULs 2015
Aromatic C12-C16	mg/kg	1800	2300	2500	LQM S4ULs 2015
Aromatic C16-C21	mg/kg	1900	1900	1900	LQM S4ULs 2015
Aromatic C21-C35	mg/kg	1900	1900	1900	LQM S4ULs 2015
Aromatic C35-C44	mg/kg	1900	1900	1900	LQM S4ULs 2015
Benzene	mg/kg	0.38	0.7	1.4	LQM S4ULs 2015
Toluene	mg/kg	880	1900	3900	LQM S4ULs 2015
Ethyl Benzene	mg/kg	83	190	440	LQM S4ULs 2015

Proposed End Use	units	Residential without plant uptake			Source
		1	2.5	6	
Soil Organic Matter Content	%				
Xylene - o	mg/kg	82	190	450	LQM S4ULs 2015
Xylene - m	mg/kg	88	210	480	LQM S4ULs 2015
Xylene - p	mg/kg	79	180	430	LQM S4ULs 2015
MTBE (Methyl tert-butyl ether)	mg/kg				CL:AIRE 2009
Naphthalene	mg/kg	2.3	5.6	13	LQM S4ULs 2015
Acenaphthylene	mg/kg	2900	4600	6000	LQM S4ULs 2015
Acenaphthene	mg/kg	3000	4700	6000	LQM S4ULs 2015
Fluorene	mg/kg	2800	3800	4500	LQM S4ULs 2015
Phenanthrene	mg/kg	1300	1500	1500	LQM S4ULs 2015
Anthracene	mg/kg	31000	35000	37000	LQM S4ULs 2015
Fluoranthene	mg/kg	1500	1600	1600	LQM S4ULs 2015
Pyrene	mg/kg	3700	3800	3800	LQM S4ULs 2015
Benzo(a)anthracene	mg/kg	11	14	15	LQM S4ULs 2015
Chrysene	mg/kg	30	31	32	LQM S4ULs 2015
Benzo(b)fluoranthene	mg/kg	3.9	4	4	LQM S4ULs 2015
Benzo(k)fluoranthene	mg/kg	110	110	110	LQM S4ULs 2015
Benzo(a)pyrene	mg/kg	3.2	3.2	3.2	LQM S4ULs 2015
Indeno(1,2,3-cd)pyrene	mg/kg	45	46	46	LQM S4ULs 2015
Di-benzo(a,h.)anthracene	mg/kg	0.31	0.32	0.32	LQM S4ULs 2015

Proposed End Use	units	Residential without plant uptake			Source
		1	2.5	6	
Soil Organic Matter Content	%				
Benzo(g,h,i.) Perylene	mg/kg	360	360	360	LQM S4ULs 2015
Phenol	mg/kg	750	1300	2300	LQM S4ULs 2015
Pentachlorophenol (PCP)	mg/kg	27	29	31	LQM S4ULs 2015
1,1,2,2 Tetrachloroethane	mg/kg	3.9	8	17	LQM S4ULs 2015
1,1,1,2 Tetrachloroethane	mg/kg	1.5	3.5	8.2	LQM S4ULs 2015
1,1,1 Trichloroethane	mg/kg	9	18	40	LQM S4ULs 2015
Trichloroethene	mg/kg	0.017	0.036	0.08	LQM S4ULs 2015
Tetrachloromethane (Carbon Tetrachloride)	mg/kg	0.026	0.056	0.13	LQM S4ULs 2015
1,2- Dichloroethane	mg/kg	0.0092	0.013	0.023	LQM S4ULs 2015
Chloroethene (Vinyl chloride)	mg/kg	0.00077	0.001	0.0015	LQM S4ULs 2015
Trichloroethene	mg/kg	0.017	0.036	0.08	LQM S4ULs 2015
Tetrachloroethene	mg/kg	0.18	0.4	0.92	LQM S4ULs 2015
Trichloromethane (Chloroform)	mg/kg	1.2	2.1	4.2	LQM S4ULs 2015
Sum of PCDDs, PCDFs and dioxins like PCBs	mg/kg				CLEA SGVs 2009
Isopropylbenzene	mg/kg	12	28	67	CL:AIRE 2009
Propylbenzene	mg/kg	40	97	230	CL:AIRE 2009
Styrene	mg/kg	35	78	170	CL:AIRE 2009
Bromobenzene	mg/kg	0.91	2.1	4.9	CL:AIRE 2009

Proposed End Use	units	Residential without plant uptake			Source
		1	2.5	6	
Soil Organic Matter Content	%				
1,1,2 Trichloroethane	mg/kg	0.88	1.8	3.9	CL:AIRE 2009
1,1-Dichloroethane	mg/kg	2.5	4.1	7.7	CL:AIRE 2009
1,1-Dichloroethene	mg/kg	0.23	0.41	0.82	CL:AIRE 2009
1,2,4-Trimethylbenzene	mg/kg	0.41	0.99	2.3	CL:AIRE 2009
1,2-Dichloropropane	mg/kg	0.024	0.042	0.085	CL:AIRE 2009
2-Chloronaphthalene	mg/kg	3.8	9.3	22	CL:AIRE 2009
Bromodichloromethane	mg/kg	0.019	0.034	0.07	CL:AIRE 2009
Bromoform	mg/kg	5.2	11	23	CL:AIRE 2009
Chloroethane	mg/kg	8.4	11	18	CL:AIRE 2009
Chloromethane	mg/kg	0.0085	0.0099	0.013	CL:AIRE 2009
Cis 1,2 Dichloroethene	mg/kg	0.12	0.2	0.39	CL:AIRE 2009
Dichloromethane	mg/kg	2.1	2.8	4.5	CL:AIRE 2009
Hexachloroethane	mg/kg	0.22	0.54	1.3	CL:AIRE 2009
Trans 1,2 Dichloroethene	mg/kg	0.19	0.35	0.71	CL:AIRE 2009
Bis (2-ethylhexyl) phthalate	mg/kg	2700	2800	2800	CL:AIRE 2009
Butyl benzyl phthalate	mg/kg	42000	44000	44000	CL:AIRE 2009
Diethyl Phthalate	mg/kg	1800	3500	6300	CL:AIRE 2009
Di-n-butyl phthalate	mg/kg	450	450	450	CL:AIRE 2009
Di-n-octyl phthalate	mg/kg	3400	3400	3400	CL:AIRE 2009
Biphenyl	mg/kg	220	500	980	CL:AIRE 2009

Proposed End Use	units	Residential without plant uptake			Source
Soil Organic Matter Content	%	1	2.5	6	
2,4-Dinitrotoluene	mg/kg	170	170	170	CL:AIRE 2009
2,6-Dinitrotoluene	mg/kg	78	84	87	CL:AIRE 2009
Tributyl tin oxide	mg/kg	1.4	3.1	0.24	CL:AIRE 2009

Soil Contamination – Risk of Harm to Property

Structures and Underground Services

Buried Concrete

BRE Special Digest 1 (2005), 3rd Edition, entitled *Concrete in aggressive ground*, provides guidance on the specification for concrete for installation in natural ground and in brownfield locations. The procedures given for the ground assessment and concrete specification cover the fairly common occurrences of sulfates, sulfides and acids, and the more rarely occurring aggressive carbon dioxide found in some ground and surface waters, which affects concrete foundations and sub-structures. It gives procedures for specification of concrete and applies to both buildings and civil engineering construction.

Water Supply Pipes

Guidance is provided in the UK Water Industry Research (UKWIR) report entitled “*Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites*” Report Ref. No. 10/WM/03/21, 2010.

Guidance is provided in the November 2010 Q&A Update and the Questions and Answers Sheet dated 4 May 2011 included at the back of the UKWIR report. Item 3 has been reproduced here:

Table H2 UKWIR guidance

Item	Question	Answer
3	Following the flow chart in Figure 1.1, would it be acceptable to not undertake a site investigation and specify the use of barrier pipes (these seem to be suitable for all conditions)? Would it be acceptable to adopt the blanket approach of always using barrier pipes at Brownfield sites, negating the need for a desk study or intrusive investigation?	The UKWIR project steering group decided that barrier pipes would provide sufficient protection for the supply of drinking water in all Brownfield site conditions. It is therefore reasonable to expect that water companies will accept the use of barrier pipe in all situations as a blanket approach

Soil Contamination – Risk of Combustion

The combustibility of soils is a complex function of soil type, energy content, and availability of oxygen. The Building Research Establishment (BRE) has published guidance based on Calorific Value (i.e. energy content, alone), namely *IP 2/87, Fire and explosion hazards associated with the redevelopment of contaminated land*. This document provides a level below which combustibility is unlikely (2MJ/kg) and a level above which combustibility is likely (10MJ/kg). In the range between these two values combustibility is uncertain. Therefore, where the lower value is exceeded, the other key factors mentioned above need to be considered.

Soil Contamination – Risk of Harm to Vegetation

Where there is topsoil present on Site and it is being considered for reuse in landscaped areas then it needs to be assessed for its suitability for use by an appropriately qualified specialist. Topsoil can be both naturally-occurring and manufactured. The requirements for topsoil that is to be reused on site are specified in BS3882:2015 and cover a range of properties including texture, organic matter content, grading, pH, nutrients and phytotoxic contaminants. The specification for phytotoxic contaminants is reproduced in the table below:

Table H3 Phytotoxic Contaminants (by soil pH) for Topsoil

Contaminant*	pH		
	<6	6.0 to 7.0	>7
Zinc (Nitric acid extractable**)	<200mg/kg	<200mg/kg	<300mg/kg
Copper (Nitric acid extractable**)	<100mg/kg	<135mg/kg	<200mg/kg
Nickel (Nitric acid extractable**)	<60mg/kg	<75mg/kg	<110mg/kg

Footnotes: * The lower of the Generic Assessment Criteria for chemical contaminants (human health and the environment) and phytotoxicity shall be used for topsoil

** The method of testing is given in Annex D to BS3882:2015 Specification for topsoil and requirements for use.

The risk to human health and the environment needs to be considered as well as phytotoxicity and this will be carried out using the Generic Assessment Criteria selected for these risks as described elsewhere in this appendix and this report.

In order to assess the suitability of topsoil to be reused the full range of testing specified needs to be carried out and assessed by an appropriately qualified specialist.

Controlled Waters Generic Assessment Criteria

The Screening Values adopted by Waterman for ground and surface water quality have been selected on the basis of the water quality standards that apply at the controlled water receptor considered to be at potential risk of harm.

Surface Waters

The Water Framework Directive (WFD) (2000/60/EC) was originally introduced in 2000, however a raft of Daughter Directives were introduced to address the objectives the WFD originally set out. Over time the WFD and its Daughter Directives have gradually replaced number of the existing Directives including the Dangerous Substances Directive (DSD) and Surface Water Directive (SWD).

The WFD identifies 'Priority' and 'Priority Hazardous Substances', to which Environmental Quality Standards (EQS) have been determined. The WFD EQS do not provide a full complement of applicable values to adopt. In the absence of an EQS, values under the replaced Surface Water Directive have been used as a guide.

Groundwater

The EU Drinking Water Directive (DWD) (98/83/EC) lays out the standards for drinking water EU wide. The UK have followed the EU regulations and translated the Directive into the Water Supply (Water Quality) Regulations England 2000. The UK Drinking Water Standards are the most relevant criteria to use for the assessment of risks to water destined for potable sources.

The WFD, to date, have not set threshold values for groundwater on a river basin basis.

TPH and PAHs

A suitable risk based assessment criteria for risks from TPH in both surface waters and groundwater are not available in the UK. The WHO have produced a health based risk assessment for drinking waters

with regard to TPH “Petroleum Products in Drinking Waters, Background document for development of WHO Guidelines for Drinking-water Quality. Ref. WHO/SDE/WSH/05.08/123”.

A complete list of assessment criteria for PAHs is absent from the UK (benzo(a)pyrene is available). However, the risk from PAHs should be considered. The theory presented in the WHO document “Petroleum Products in Drinking Waters, Background document for development of WHO Guidelines for Drinking-water Quality. Ref. WHO/SDE/WSH/05.08/123” has been applied to provide indicative screening values for PAHs with regard to drinking water. Published TDI and ID effects have been amended for the UK standard body weight and behaviour to derive a UK guideline for DWS of PAHs (70kg body weight and 2l of water consumed per day).

The derived TPH and PAH screening values are used as an indication of the risks from TPH and PAHs to human health through drinking water only.

The standards for the substances tested for in this investigation are provided below.

Table H4 Water Quality Standards

Determinand	Concentration (µg/l)		
	Surface Water - EQS Freshwater (DEFRA Directions 2015)	UK Drinking Water Standard (DWS)	WHO Drinking Water Standard
Metals			
Arsenic	50	10	-
Barium	-	-	700
Beryllium	-	-	12
Boron	-	1000	-
Cadmium	0.25*	5	-
Copper	7.59 – 60.34	2000	-
Chromium (total)	4.7	50	-
Chromium (VI)	3.4	-	-
Chromium (III)	4.7	-	-
Iron	1000	200	-
Lead	2.29 – 19.32	10	-
Manganese	123 – 1033.09	50	-
Mercury	0.07	1	-
Nickel	4.00 – 35.68	20	-
Selenium	-	10	-
Zinc	17.19 – 52.25**	-	-

Non-Metals			
Cyanide	1	50	-
Chloride	-	250,000	-
Nitrate	-	50,000	-
Sulphate	-	250,000	-
Ammonia (total)	-	500	-
Nitrite	-	500	-
BTEX			
Benzene	10	1	-
Ethyl Benzene	-	-	300
Toluene	74	-	-
Xylene (p+m)	30	-	500
MTBE	-	-	15***
Phenol	7.7	-	-
Petroleum Hydrocarbons			
Aliphatic EC5 - EC6	-	-	15,000
Aliphatic EC6 - EC8	-	-	15,000
Aliphatic EC8-EC10	-	-	300
Aliphatic EC10-EC12	-	-	300
Aliphatic EC12-EC16	-	-	300
Aromatic EC6-EC7 (Benzene)	10	1	
Aromatic EC7-EC8 (Toluene)	74	-	700
Aromatic EC8-EC10	-	-	300****
Aromatic EC10-EC12	-	-	90
Aromatic EC12-EC16	-	-	90
Aromatic EC16-EC21	-	-	90
Aromatic EC21-EC35	-	-	90
Polycyclic Aromatic Hydrocarbons			
Anthracene	0.1	-	1050
Acenaphthene	-	-	210*****
Acenaphthylene	-	-	210*****

Chrysene	-	-	1.085*****
Di-benzo(a,h.)anthracene	-	-	0.01085*****
Phenanthrene	-	-	43.75*****
Benzo(a)pyrene	0.00017	0.01	-
Benzo(b)fluoranthene	0.00017	0.1b	-
Benzo(g,h,i.) Perylene	0.00017	0.1	-
Benzo(k)fluoranthene	0.00017	0.1	-
Fluoranthene	0.0063	-	-
Indeno(1,2,3-cd)pyrene	0.00017	0.1	-
Naphthalene	2	-	70
Fluorene	-	-	140*****
Benzo(a)anthracene	-	-	0.543*****
Pyrene	-	-	105*****
Volatile Organic Compounds			
Vinyl Chloride	-	0.5	-
1,1-dichloroethene	-	-	30
Trans 1,2-Dichloroethene	-	-	0.3
Chloroform	-	100c	-
1,2-Dichloroethane	10	3	-
Trichloroethene (TCE)	-	10	-
Bromodichloromethane	-	100	-
Tetrachloroethene (PCE)	-	10	-
1,3-Dichloropropane	-	100	40
Bromoform	-	100	-
1,4-Dichlorobenzene	-	-	300
1,2-Dichlorobenzene	-	-	1000
1,2-Dibromo-3-chloropropane	-	-	1

* Value for Class 5 water, assumes >200mgCaCO₃/L

** Ambient background concentration of zinc for Thames catchment is 2ug/l

*** Odour and taste threshold

**** Value for ethylbenzene

***** Waterman-derived criteria based on guidance in WHO document and UK background data

b - Sum of 4 PAHs

c - sum of 4 trichlorohalides – Chloroform, bromoform, dibromoform and bromodichloromethane

Bioavailability based Environmental Quality Standards

Under the Water Framework Directive, originally introduced in 2000, and transposed into the UK regulatory framework via the Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015, we are now required take account of the bioavailability when assessing the toxicity of heavy metal contamination in the freshwater environment.

What is Bioavailability and Why Account for it?

It is widely accepted that the total concentration of certain metals in freshwater often has limited relevance to potential environmental risk, but it is the 'bioavailable' fraction that is likely to result in toxic effects to aquatic organisms. Effectively, it's the bioavailability of a metal which reflects the actual metal concentration that the organism will be exposed to, and thus is the relevant concentration that we are interested in when assessing risk.

EQS developed under previous legislation (including the Dangerous Substances Directive (76/464/EEC)) were expressed as total concentration relative to hardness bandings to reflect the indications that toxicity to aquatic life was influenced by water hardness. Scientific knowledge and understanding on the impact of metals has since developed, and metal bioavailability in aquatic systems is now understood to be influenced by several site-specific physio-chemical factors including the pH, calcium content and the level of dissolved organic carbon (DOC) present within the water body under consideration.

Taking bioavailability into account as part of the risk assessment process is now considered best practice and will enable more accurate estimation of metal toxicity and the risks posed to the freshwater environment.

How to Account for Metal Bioavailability

The increased understanding of the impact of certain metals on the aquatic environment has enabled EQSs to be published by the UK Secretary of State for a number of metals based on their bioavailable concentration. These are referred to as EQSbioavailable and are listed in the Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

It is very difficult to measure the bioavailable concentration of a metal directly. We therefore have to rely on models to predict the bioavailable concentration from dissolved concentrations. In the UK, a simple predictive tool has been developed that can take account of water quality parameters such as pH, and calcium to determine the amount of bioavailable metal present in the freshwater environment.

The tool is called the Metal Bioavailability Assessment Tool (M-BAT) and is acceptable for use under the UK regulatory framework.

Use of Background Concentrations for the Assessment of Zinc.

Metals occur naturally in the aquatic environment due to weathering of surface geology, and under the EQS Directive (2008/105/EEC) background concentrations for metals can be considered when assessing compliance against the respective EQS.

The situation for Zinc is now slightly different, and consideration of background concentration is now an explicit part of the zinc EQS released under the WFD and needs to be taken into account as part of the initial compliance assessment.

Using this approach, a local background concentration should be subtracted from the monitoring data before the bioavailability estimate is performed using M-BAT. Under the WFD, catchment specific background values have been defined for England and Wales to be used in conjunction with the EQSbioavailable. The background values are listed within the Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 Schedule 3, Part 2, Table 2, and also reproduced in Appendix A of the M-BAT user guide.

Lead

Lead is not included in the M-BAT tool (referred to above) as it is not a full bioavailable EQS. The EQS for lead is an EU standard under WFD. It takes into account the influence of DOC on the toxicity of lead but, unlike the full bioavailable standards for zinc, copper, manganese and nickel which are included in M-BAT, it only considers the influence of DOC, and does not require the consideration of calcium or pH.

Ground Gas and Volatile Organic Compounds Generic Assessment Criteria

Ground Gas

Current UK guidance has been produced by CIRIA, the British Standards Institution (BSI) and CL:AIRE. The following relevant documents have been prepared to date:

- CIRIA C665 – Assessing the risks posed by hazardous ground gases to buildings, 2007;
 - Aims to consolidate good practice in investigation, facilitate the collection of relevant data, instigate appropriate monitoring programmes, all in a risk based approach to gas contaminated land.
- BS 8576 – Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs), 2013;
 - Provides guidance on the monitoring and sampling of ground gases, including methane, carbon dioxide, oxygen, and VOCs. Guidance is not provided on the risk evaluation and characterisation of site's, the selection and design of protective measures, verification of protective measures, sampling of atmospheric gases, and the monitoring and sampling of radon.
- CIRIA C735 – Good practice on the testing and verification of protection systems for buildings against hazardous ground gases, 2014; and
 - Sets out the good practice guidance for the designer, installer, verifier, and regulator on the verification and integrity testing of gas protection systems.
- BS 8485 – Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings, 2015.
 - Provides guidance on the appropriate ground gas parameters that can be used to identify a range of possible design solutions for protection against methane and carbon dioxide on a development.
- CL:AIRE - Technical Bulletin (TB 17), August 2018
 - The bulletin provides guidance on assessing ground gas monitoring data to ensure that sufficient data has been collected to cover critical variations in barometric pressure

Both the CIRIA and BSI publications have been prepared to be generally consistent with CLR11, *Model Procedures for the management of land contamination*, (Defra and the Environment Agency, 2004a) and follow a step by step approach summarised below:

1. Desk Study and Site Walkover.
2. Development of a Preliminary Conceptual Model and Risk Assessment.
3. Site Investigation (If deemed necessary from stage 2).
4. Risk Assessment and Site Characterisation.

5. Recommendation and Mitigation.

Where the preliminary conceptual model has deemed further investigation necessary to characterise the ground gas regime, an appropriate site investigation and monitoring regime should be designed and undertaken. In-depth guidance to assist in the design of the investigation is provided within C665 and BS 8576, which describes intrusive investigation techniques and provides guidance on selecting the number and location of monitoring wells based on the site specific conceptual model.

Waterman has generally followed the approach recommended in CIRIA C665, BS 8576, and BS 8485 with respect to characterising a site and determining the levels of gas protection methods required. Where deviations from the methodology detailed within above guidance occurs, the reasoning behind the deviation and implication of the analysis of the results has been included within the report.

Risk Assessment

In accordance with C665, to assess the ground gas regime at a site, the ground gas monitoring data should be assessed by determining the Gas Screening Value (GSV) (l/hr). BS 8485 details further guidance on which GSV can be adopted based on a number of modifiers.

$GSV = (\text{Measured Maximum CO}_2 \text{ or CH}_4 \text{ Gas Concentration (\%)} / 100) \times \text{Maximum Measured Gas Flow Rate from boreholes (l/hr)}$.

Both C665 and BS 8485 dictate where the gas flow has been measured as less than the detection limit of the instrument used (typically <0.1l/hr), the limit of detection of the instrumented should be used as the gas flow rate.

As per the guidance given in BS 8485 where a negative flow has been recorded, and there is an absence of a positive flow, a qualitative assessment has been undertaken into whether under different temporal conditions, a similar positive flow could occur. When the cause for negative flow is reasonably understood, it has been possible to rule out a corresponding credible positive flow and discount the negative flow.

The Gas Screening Value is used to classify the site, subject to the proposed end use of the site.

The Modified Wilson and Card classification system is used to attribute a Characteristic Situation (CS) value to the site/zone depending upon the calculated GSV. When attributing a CS, additional factors including the maximum recorded gas concentration and the maximum recorded gas flow rate should also be taken into account and may result in an increase in the CS value. Table H.5 below, outlines the CS values associated GSV's and additional factors which must be taken into account.

Table H5 Modified Wilson and Card Classification

Characteristic Situation (CIRIA 149)	Risk Classification	Gas screening value (CH ₄ CO ₂) l/hr	Additional Factors	Typical source of generation
1	Very low risk	<0.07	Typically methane ≤1% and / or carbon dioxide ≤5%. Otherwise consider increase to CS 2.	Natural soils with low organic content 'Typical' made ground
2	Low risk	<0.7	Borehole air flow rate not to exceed 70 l/hr.	Natural soil, high peat/organic content.

Characteristic Situation (CIRIA 149)	Risk Classification	Gas screening value (CH ₄ CO ₂) l/hr	Additional Factors	Typical source of generation
			Otherwise consider increase to CS 3.	'Typical' made ground
3	Moderate risk	<3.5		Old landfill, inert waste, mineworking flooded
4	Moderate to high risk	<15	Quantitative risk assessment required to evaluate scope of protective measures.	Mineworking – susceptible to flooding, completed landfill (WMP 26B criteria)
5	High risk	<70		Mineworking unflooded inactive with shallow workings near surface
6	Very High risk	>70		Recent landfill site

Notes:

- 1) Gas screening value: litres of gas / hour is calculated by multiplying the gas concentration (%) by the measured borehole flow rate (l/hr)
- 2) Source of gas and generation potential/performance must be identified.
- 3) If there is no detectable flow use the limit of detection of the instrument.

Following determination of the site's CS, the requirements and scope of gas protection measures can be prescribed based on the guidance given in BS 8485:2015.

BS 8485 details the required ground gas protection measures for a development using a points-based system, whereby a certain number of points must be accumulated through the installation of various protection measures to mitigate the risk to structures or buildings from the accumulation of methane or carbon dioxide. The number of points assigned will be dependent on the building type and the CS.

Table H6 Building types are separated into four distinct scenarios.

Kj,f Modifier	Building Type			
	Type A	Type B	Type C	Type D
Ownership	Private	Private or commercial / public, possible multiple	Commercial / public	Commercial / industrial
Control (change of use, structural alterations, ventilation)	None	Some but not all	Full	Full
Room sizes	Small	Small / medium	Small to large	Large industrial / retail park style

Further details on the description of the building types, along with examples are included in BS 8485.

Following identification of the appropriate Building Type and CS, the minimum gas protection score can be determined through the use of the following table.

Table H7 Gas Protection Score

Characteristic Situation	Minimum Gas Protection Score			
	Type A	Type B	Type C	Type D
1	0	0	0	0
2	3.5	3.5	2.5	1.5
3	4.5	4	3	2.5
4	6.5 ^A	5.5 ^A	4.5	3.5
5	N/A ^B	6.5 ^A	5.5	4.5
6	N/A ^B	N/A ^B	7.5	6.5

^AResidential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system e.g. in Institutional and / or fully serviced contractual situations.

^BThe gas hazard is too high for this empirical method to be used to define the gas protection measures.

Post determination of the minimum gas protection score, a combination of two or more of the following three types of protection measures should be used to achieve the score:

- The structural barrier of the floor slab, or of the basement slab and walls if a basement is present;
- Ventilation measures; and
- Gas resistant measures.

Through combining at least two ground gas protection measures, the lack of redundancy in the use of a single protection measure approach is negated. The ground gas protection measures should work independently and collaboratively.

The tables below detail the specific ground gas protection measures and their associated scores.

Table H8 Structural Barrier

Floor and substructure design	Score ^A
Precast suspended segmental subfloor (I.e. beam and block)	0
Cast in-situ ground bearing floor slab (with only nominal mesh reinforcement)	0.5
Cast in-situ monolithic ground bearing raft or reinforced cast in-situ suspended floor slab with minimal penetrations	1 or 1.5 ^B
Basement floor and slab conforming to BS 8102:2009, Grade 2 waterproofing ^C	2
Basement floor and walls conforming to BS 1802:2009, Grade 3 waterproofing ^C	2.5

^AThe scores are conditional on breaches of floor slabs, etc., being effectively sealed.

^BTo achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast.

^CThe score is conditional on the waterproofing not being based on the use of a geosynthetic clay liner waterproofing product.

Table H9 Ventilation Measures

Protection element / system	Score	Comments
Pressure relief pathway (usually formed of low fines gravel or with a thin geocomposite blanket or strips terminating in a gravel trench external to the building).	0.5	Whenever possible a pressure relief pathway (as a minimum) should be installed in all gas protection measure systems. If the layer has a low permeability and / or is not terminated in a venting trench or similar, then the score is zero.
Passive sub floor dispersal layer: Very good performance: Good performance: Media used to provide the dispersal layer are; <ul style="list-style-type: none"> • Clear void; • Polystyrene void former blanket; • Geocomposite void former blanket • No-fines gravel layer with gas drains; • No-fines gravel layer. 	2.5 1.5	The ventilation effectiveness of different media depends on a number of different factors including the transmissivity of the medium, the width of the building, the side ventilation spacing, and type and thickness of the layer. The selected score should be assigned taking into account the recommendations in Annex B of BS 8485 2015. Passive ventilation should be designed to meet at least good performance, see in Annex B of BS 8485 2015.
Active dispersal layer, usually comprising fans with active abstraction (suction) from a subfloor dilution layer, with roof level vents. The dilution layer may compromise a clear void or be formed of geocomposite or polystyrene void formers.	1.5 to 2.5	This system relies on continues serviceability of the pumps, therefore alarm and response systems should be in place. There should be robust management systems in place to ensure the continued maintenance of the system including pumps and vents. Active ventilation should always be designed to meet at least good performance as described in in Annex B of BS 8485 2015.
Active positive pressurization by the creation of a blanket of external fresh air beneath the floor slabs by pumps supplying air to points across the central footprint of the building into a permeable layer, usually formed of a thin geocomposite blanket.	1.5 to 2.5	This system relies on continues serviceability of the pumps, therefore alarm and response systems should be in place. The score assigned should be based on the efficient coverage of the building footprint and the redundancy of the system. Active ventilation should always be designed to meet at least good performance.
Ventilated car park (floor slab of occupied part of the building under consideration is underlain by a basement or undercroft car park).	4	Assumes that the car fumes is vented to deal with exhaust fumes designed to <i>Buildings Regulations 2000, Approved Document F.</i>

It should be noted that for Type A Buildings active ventilation systems are inappropriate.

Table H10 Membrane

Protection element / system	Score	Comments
Gas resistant membrane meeting all of the following criteria; Sufficiently impervious to the gases with a methane gas transmission rate <40m ³ /day/m ² /atm (average) for sheet and joints (tested in accordance with BSO ISO 15105-1 manometric method);	2	The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints.

Protection element / system	Score	Comments
<p>Sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions;</p> <p>Sufficiently strong to withstand in-service stresses (e.g. settlement if placed below the floor slab)</p> <p>Sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc.);</p> <p>Capable, after installation, of providing a complete barrier to the entry of the relevant gas; and</p> <p>Verified in accordance with CIRIA C735.</p>		<p>For example, a minimum 1.4mm thickness (equivalent to 370g/m² for polyethylene), reinforced membrane (virgin polymer) meets the performance criteria.</p> <p>If a membrane is installed that does not meet the all the criteria in column 1 then the score is zero.</p>

A gas protection score should only be assigned to a membrane which is formed of a material with suitably low gas permeability and which has been installed so it completely seals the foundation (including effective seals around all penetrations) and does not sustain damage from in-service stresses.

Volatile Organic Compounds (VOCs)

The Building Regulations 2000 Approved Document C (2004 Edition) also refers to volatile organic carbons (VOCs). These are primarily assessed by examination of the VOC content of site soils. Further guidance on VOCs is provided in *"The VOCs Handbook; Investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination"*, CIRIA Report C682, 2009.

For former landfill sites the risk from a wider range of trace gases are considered on a site specific basis when appropriate.

VOCs in groundwater

Under the Environmental Protection Act 1990, Building Regulations Approved Document C 2004 and the National Planning Policy Framework there is a requirement to ensure that Volatile Organic Compounds (VOC) are considered on a risk assessment basis.

VOCs are organic compounds that are volatile under normal atmospheric conditions. However, they may be found in the solid, liquid, and the dissolved phase as well as in the gaseous phase. VOCs are typically found in the following contaminants:

- Petroleum (non-halogenated) hydrocarbons (e.g. benzene, toluene, and butylbenzenes);
- Halogenated hydrocarbons (e.g. chlorinated ethenes and ethanes (dry cleaning fluids or degreasers) or chlorofluorocarbons (freons)); and
- Organic compounds containing nitrogen, sulphur, and oxygen (e.g. tetrahydrofuran).

The likely sources of the above contaminants include:

- Spills, leaks, and discharges from industries;
- Landfills;
- Buildings, furnishings, and common household products;
- Vehicle emissions;
- Marshland; and

- Uncontrolled waste disposal.

The risk to receptors from VOC occur from inhalation (acute and chronic), and a flammable / explosive risk when present at high concentrations in confined spaces.

Current UK guidance for VOCs are limited in comparison to ground gas, and is primarily given in the “*The VOCs Handbook; Investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination*”, CIRIA Report C682, 2009.

Additional guidance was published in 2017 by the Society of Brownfield Risk Assessments (SoBRA) ‘*Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile contaminants in Groundwater*’, February 2017. The 2017 SoBRA document provided a set of Generic Assessment Criteria (GAC) to allow the risk to a residential/commercial premise to be assessed quantitatively using the contamination concentrations recorded in the groundwater. The GAC were generated using the CLEA model, with each GAC being the theoretical concentration in groundwater/perched water beneath a property that is modelled as resulting in estimated average daily exposure (ADE) to the critical receptor that is equal to the Health Criteria Value (HCV).

The GAC were designed to incorporate several precautionary assumptions, these conservatisms include;

- The assumption that the impacted groundwater/perched water is directly beneath the building, when it may instead be offset from the receptor;
- The assumption that there is an infinite source term, when in fact the source may be finite;
- The assumption that there is no biodegradation between the source term and the receptor;
- The assumption that the groundwater source is at a depth of 0.65m bgl;
- The use of sand soil type for both the saturated and unsaturated zone.
- The omission of a capillary zone between the saturated and unsaturated zone.

These GAC are detailed in the Tables below.

Table H11 Petroleum Hydrocarbons

Chemical	CAS	GAC _{gwvap} (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
1,2,4-Trimethylbenzene	95-63-6	24	2,200	559,000
Benzene 3	71-43-2	210	20,000	1,780,000
Ethylbenzene 3	100-41-4	10,000	960,000 (sol)	180,000
Isopropylbenzene	98-82-8	850	86,000 (sol)	56,000
Propylbenzene	103-65-1	2,700	240,000 (sol)	54,100
Styrene	100-42-5	8,800	810,000 (sol)	290,000
Toluene 3	108-88-3	230,000	21,000,000 (sol)	590,000
TPH Aliphatic EC5-EC6 3		1,900	190,000 (sol)	35,900
TPH Aliphatic >EC6-EC8 3		1,500	150,000 (sol)	5,370
TPH Aliphatic >EC8-EC10 3		57	5,700 (sol)	427

Chemical	CAS	GACgwvap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
TPH Aliphatic >EC10-EC12 3		37	3,600 (sol)	34
TPH Aromatic >EC5-EC7 2,3		210,000	20,000,000 (sol)	1,780,000
TPH Aromatic >EC7-EC8 3		220,000	21,000,000 (sol)	590,000
TPH Aromatic >EC8-EC10 3		1,900	190,000 (sol)	64,600
TPH Aromatic >EC10-EC 12 3		6,800	660,000 (sol)	24,500
TPH Aromatic >EC12-EC16 3		39,000	3,700,000 (sol)	5,750
meta-Xylene 3,5	108-38-3	9,500	940,000 (sol)	200,000
ortho-Xylene 3,5	95-47-6	12,000	1,100,000 (sol)	173,000
para-Xylene 3,5	106-42-3	9,900	980,000 (sol)	200,000

Table H12 Polycyclic Aromatic Hydrocarbons

Chemical	CAS	GAC gw vap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
Acenaphthene	83-32-9	170,000 (sol)	15,000,000 (sol)	4,110
Acenaphthylene	208-96-8	220,000 (sol)	20,000,000 (sol)	7,950
Fluorene	86-73-7	210,000 (sol)	18,000,000 (sol)	1,860
Naphthalene	91-20-3	220	23,000 (sol)	19,000

Table H13 Pesticides

Chemical	CAS	GACgwvap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
Aldrin	309-00-2	47 (sol)	3,700 (sol)	20
alpha-Endosulfan	959-98-8	7,400 (sol)	590,000 (sol)	530
beta-Endosulfan	33213-65-9	7,500 (sol)	600,000 (sol)	280

Table H14 Halogenated Organics

Chemical	CAS	GACgwvap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
1,1,1,2-Tetrachloroethane	79-34-5	240	22,000	1,110,000
1,1,1-Trichloroethane	71-55-6	3,000	290,000	1,300,000
1,1,2,2-Tetrachloroethane	79-35-4	1,600	150,000	2,930,000
1,1,2-Trichloroethane	79-00-5	520	49,000	4,491,000
1,1-Dichloroethane	75-34-3	2,700	260,000	3,666,000

Chemical	CAS	GACgwwap (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
1,1-Dichloroethene	75-35-4	160	16,000	3,100,000
1,2,3,4-Tetrachlorobenzene	634-66-2	240	31,000 (sol)	7,800
1,2,3,5-Tetrachlorobenzene	634-90-2	7.0	600	3,500
1,2,3-Trichlorobenzene	87-61-7	35	3,100	21,000
1,2,4,5-Tetrachlorobenzene	95-94-3	8.1	700 (sol)	600
1,2,4-Trichlorobenzene	120-82-1	68	7,200	41,400
1,2-Dichlorobenzene	95-50-1	2,000	220,000 (sol)	133,000
1,2-Dichloroethane	107-06-2	8.9	850	8,680,000
1,2-Dichloropropane	78-87-5	22	2,600	2,050,000
1,3,5-Trichlorobenzene	108-70-3	7.4	660	6,000
1,3-Dichlorobenzene	541-73-1	31	2,800	103,000
1,4-Dichlorobenzene	106-46-7	5,000	460,000 (sol)	51,200
Bromobenzene	108-86-1	220	20,000	388,040
Bromodichloromethane	75-27-4	17	1,600	3,000,000
Bromoform (Tribromomethane)	75-25-2	3,100	400,000	3,000,000
Chlorobenzene	108-90-7	98	15,000	387,000
Chloroethane	75-00-3	10,000	1,000,000	5,742,000
Chloroethene (Vinyl Chloride)	75-01-4	0.62	63	2,760,000
Chloromethane	74-87-3	14	1,400	5,350,000
cis-1,2-Dichloroethene	156-59-2	130	13,000	7,550,000
Dichloromethane	75-09-2	3,300	370,000	20,080,000
Hexachlorobenzene	118-74-1	16 (sol)	1,400 (sol)	10
Hexachlorobutadiene	87-68-3	1.7	230	4,800
Hexachloroethane	67-72-1	8.5	740	49,900
Pentachlorobenzene	608-93-5	140	12,000 (sol)	500
Tetrachloroethene	127-18-4	34	4,600	225,000
Tetrachloromethane (Carbon Tetrachloride)	56-23-5	5.3	770	846,000
trans-1,2-Dichloroethene	156-60-5	160	16,000	5,250,000
Trichloroethene	79-01-6	5.7	530	1,370,000
Trichloromethane (Chloroform)	67-66-3	790	85,000	8,950,000

Table H15 Others (Organic and Inorganic)

Chemical	CAS	GAC _{gw} (µg/l) 1,2		Aqueous Solubility (µg/l)
		Residential	Commercial	
2-Chloronaphthalene	91-58-7	160	14,000 (sol)	11,700
Biphenyl (Limonene)	92-52-4	15,000 (sol)	1,300,000 (sol)	4,060
Carbon disulphide	75-15-0	56	5,600	2,100,000
Mercury, elemental	7439-97-6	1.1	95 (sol)	56
Methyl tertiary butyl ether (MTBE)	1634-04-4	83,000	7,800,000	48,000,000

The risks to receptors from vapours will be assessed through assessment of the volatile contaminant concentrations recorded in groundwater samples against the SoBRA derived GAC. Where an exceedance is recorded, a qualitative assessment will be made, given the conservative approach of the SoBRA derived GAC as to whether a significant vapour regime is present on-site and possible risk to receptors exists. The vapour concentration recorded during headspace analysis of soils, SVOC / VOC contaminant concentration within soil samples, and the vapour concentration within installed boreholes will also be considered qualitatively during this assessment.

Where a significant vapour regime is present and a risk to receptors exists, further assessment will be required, this may include, vapour sampling, further intrusive investigations, or a Detailed Quantitative Risk Assessment (DQRA). Dependent on the results of the further assessment, remedial measures will be required to mitigate the risk to receptors.

UK and Ireland Office Locations

