Quod

EIA Scoping Report

Atlip Gardens, Alperton

July 2023

Q230193

Contents

1 Introduction

Background and Purpose of Report

1.1 The purpose of this report is to inform a request for an Environmental Impact Assessment ('EIA') Scoping Opinion from the London Borough of Brent ('LB Brent') on the proposed redevelopment of land at Atlip Road, Alperton, HA0 4LU ('Site'). Atlip House Ltd ('Applicant') is proposing to seek full planning permission for a residential-led development at the Site.

1.2 The development proposals are emerging and will be developed further. Planning permission is likely to be sought for up to 460 residential units, up to 390 co-living units, up to 350 square meters (sqm) of flexible town centre uses and up to 500 sqm of community uses ('Development'). Amenity and public space provision, pedestrian routes, vehicular access, circulation and car parking will also be provided.

1.3 This report sets out the findings of an EIA scoping study and accompanies a request for a Scoping Opinion submitted to LB Brent in accordance with Regulation 15 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017[1] (as amended[2]), ('EIA Regulations'). In line with the EIA Regulations, this report identifies the Site location, provides a brief description of the nature and purpose of the Development and an explanation of the likely significant effects of the Development on the environment. The report outlines the proposed content, approach and scope of the ES to be submitted with the planning application.

1.4 Figures 1.1 and 1.2 show the Site's location and the likely extent of the planning application boundary. Brief descriptions of the Site and the Development are provided within Sections 2 and 3, respectively.

Planning and EIA Context

1.5 The adopted development plans for the Site comprise:

- The London Plan 2021 – Spatial Development Strategy for Greater London[3] ('London Plan'); and
- Brent Local Plan 2019 – 2041 (February 2022)[4] ('Local Plan').

1.6 Local Plan Policy BD2: Tall Buildings designates the Site within a Tall Building Zone that is appropriate for high-density development with tall buildings defined as over 30m in height above ground level.

1.7 The Site is located within the Local Plan site allocation Policy BSWSA3 'Atlip Road'. The allocated use for the Site is for, *"Mixed-use residential-led scheme, re-provision of gym, re-providing along Ealing Road the range of town centre uses within the Atlip Centre and also the Church of God Prophecy"*. While the Church of God Prophecy sits within the site allocation, this is located outside of the Site boundary.

1.8 Policy BSWSA3 specifies that the Site is appropriate for high-density development including tall buildings in part however, any redevelopment must provide a comfortable relationship with adjacent residential development and the two-storey properties along Sunleigh Road.

1.9 The Site is also located in an area covered by Policy BSWGA1 ‘Alperton Growth Area’. This area is designated for an extensive area of mixed-use residential led regeneration principally focussed along the Grand Union canal. The area will be a location for tall buildings at its Ealing Road (which bounds the site) and Northfields end.

Figure 1.1: Site Location Plan

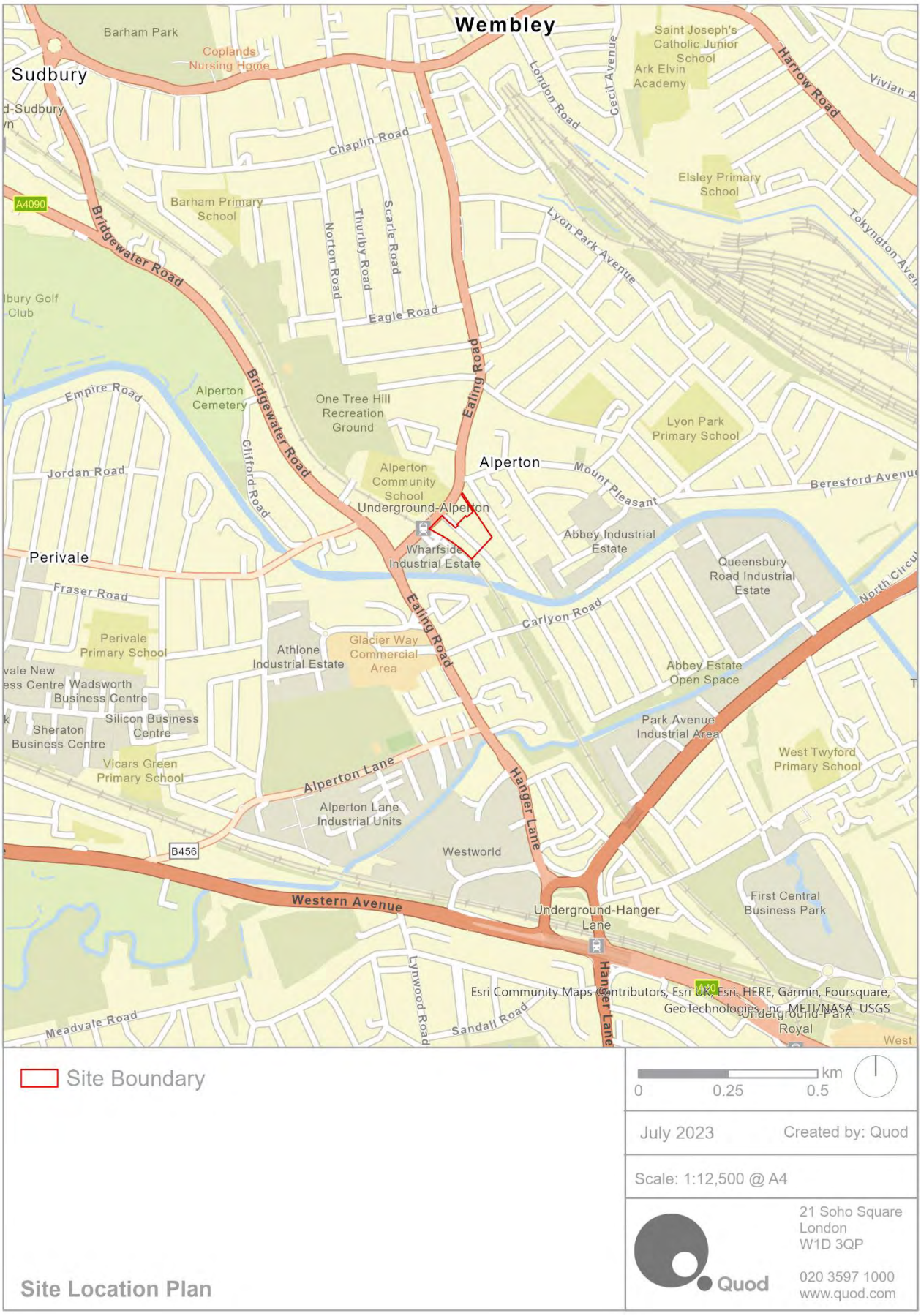


Figure 1.2: Indicative Site Boundary Plan

1.10 The Development falls within Category 10(b) of Schedule 2 of the EIA Regulations, which is applicable to 'urban development projects'. Due to the scale and nature of the Development, the Applicant has voluntarily commissioned an EIA process. EIA is a systematic process that aims to prevent, reduce or offset the significant adverse environmental effects of development proposals and enhance beneficial effects. It ensures that planning decisions are made considering the likely significant environmental effects and with engagement from statutory bodies and other stakeholders including the public.

1.11 Under the EIA Regulations, the ES will be required to be "based on" the Scoping Opinion provided by the LB Brent and will be prepared by competent experts.

Project Team

1.12 In accordance with Regulation 18(5) of the EIA Regulations, it is confirmed that this Scoping Report has been prepared by competent experts from the organisations listed in Table 1.1. These specialists will also undertake the EIA and their relevant expertise and qualifications will be stated within the ES.

Table 1.1: EIA Project Team

Organisation	Role
Atlip House Limited	Applicant
KM Development Consultancy	Development Manager

Organisation	Role
Haworth Tompkins	Architects
Landscape Projects Ltd	Landscape Architects
Quod	Planning, EIA Coordinator, Socio-Economics
RWDI	Wind Microclimate
Eb7	Daylight, Sunlight and Overshadowing
Montagu Evans	Townscape, Heritage and Visual Impact Assessment
AVR London	Accurate Visual Representations
Velocity TP	Transport, Waste and Access
XCO2	Air Quality and Noise and Vibration
Tullys	Ground Conditions and Contamination
Tullys	Water Resources, Flood Risk and Drainage
GS Ecology	Biodiversity
MOLA	Archaeology
XCO2	Energy and Sustainability

1.13 Quod will be the lead editor of the ES and author of non-technical chapters. Quod is a member of the Institute of Environmental Management and Assessment (IEMA) EIA Quality Mark Scheme, an accreditation scheme which sets high standards for EIA practice and demonstrates a commitment to excellence in EIA activities.

2 Site and Setting

Site Location, Extent and Description[1]

2.1 Figures 1.1 and 1.2 show the Site's location and likely extent of the planning application. The Site is located adjacent to the south of Alperton train station and extends to approximately 1.17 hectares (ha). The Site also comprises a section of Atlip Road providing access from Ealing Road, and a disused pedestrian access running between numbers 181 and 183 Ealing Road from the rear of the site to Ealing Road.

2.2 The Site currently comprises a brownfield site with two existing buildings; the Atlip Centre, (a three-storey building including a mix of small retail units, a gym, and banqueting suites), 2 Atlip Road (a three-storey retail warehouse building from which cars are sold online) together with hard surfaced parking areas.

2.3 The Site slopes down towards the south east, from approximately 34m above ordnance datum (mAOD) at the intersection of Atlip Road and Ealing Road, to 31mAOD on Atlip Road at the south eastern boundary of the Site. The Site is mainly comprised of hardstanding, with little to no vegetation on-site or within the surroundings. There are small patches of grass/scrub scattered within the site alongside the pavements and sparse trees in within the carparking areas on Site.

2.4 Vehicular and pedestrian access to the Site is gained via Atlip Road which runs centrally through the Site. The Site includes a 74-space car park serving the Atlip Centre and a 60-space car park serving 2 Atlip Road. The Atlip Centre fronts Ealing Road and Atlip Road (a privately maintained road of 7.3m width plus 2m footways) runs along its north eastern side, providing access to the car parks and service yards, as well as to the Alperton Village residential development to the south. Vehicular access to the adjoining church and the car park for Windsor Court (183 Ealing Road) is also taken from Atlip Road. A former 6m wide pedestrian-only access is also provided from the site onto Ealing Road at its northern end, although this is currently fenced off.

2.5 The Site is bound by Ealing Road to the north west, residential properties along Sunleigh Road to the north east, mixed use buildings to the south east and the Piccadilly Underground line to the south west of the Site. The Grand Union Canal is located 50m to the south of the Site.

Table 2.1: Existing Uses On-Site

Planning Unit	Existing Use Class	GIA (sq ft)
Atlip Centre		
Unit 1-3	Class E(a) (formerly A1 Retail)	4,209
Unit 4 & Basement	Class E(d) (formerly D2)	9,322

[1] N.B. All distances stated are taken from closest point on Site boundary.

Planning Unit	Existing Use Class	GIA (sq ft)
Unit 5	Class E(a) (formerly A1 Retail)	205
Units 6-7	Class E(a) (formerly A1 Retail)	441
Unit 7a	Class E(a) (formerly A1 Retail)	215
Units 8-10	Class E(d) (formerly D2)	22,960
Units 11-12	Class E	1,981
Units 24-25	Class E(b) / Sui Generis (formerly A3 / D2)	25,607
2 Atlip Road		
2 Atlip Road	Class E(a))	21,991
Unit 2D, 2 Atlip Road	Class E(a)	4,564
Total Floorspace		**91,493**

Surrounding Context

Surrounding Land Uses

2.6 The Site is in a predominantly low-rise area comprising a mixture of industrial estate uses, residential properties, education and transport developments.

2.7 The Site is located to the south east of Ealing Road, with the Atlip Centre fronting Ealing Road, immediately opposite Alperton Station and Alperton Community School. On the Ealing Road frontage between the Atlip Centre and the pedestrian access is a two-storey church building and a mixed-use development of three to eight stories with ground floor retail uses and upper floors in residential use.

Transport and Access

2.8 The Site is located on the southern edge of Controlled Parking Zone 'E', operating between 8am and 9pm daily (8am to midnight on Wembley Stadium event days). On-street parking and loading are generally prohibited at all times along the Ealing Road frontage, with a bus stop clearway and a zebra crossing further restricting stopping along the Site frontage. Parking in streets to the south, east and west is generally unrestricted.

2.9 Public transport access to the Site is good, with a public transport accessibility level (PTAL) rating of 4, with Alperton Station (which has access to the Piccadilly Line) and seven bus services within 640m metres (8 minutes' walk). The PTAL rating is predicted to increase to 5 by 2031, due to planned enhancements to the capacity of the Piccadilly Line.

Environmental Sensitivities

2.10 Figure 2.1 identifies the key environmental sensitivities within 1km of the Site.

2.11 The Site is not located within a 'sensitive area' (as defined in Part 1 of the EIA Regulations) (i.e. a European site or Site of Special Scientific Interest (SSSI)[2], National Park, Area of Outstanding Natural Beauty, World Heritage Site (WHS), or Scheduled Monument) and is not subject to any statutory or non-statutory designations for nature conservation or heritage. There are no WHS, Registered Parks and Gardens or Registered Battlefields within 500m.

2.12 The Site is not located within a Conservation Area (CA) and there are no listed or (non-statutory) locally listed buildings on-site. The closest Conservation Area, Wembley High Street, is located 1.90 km north of the Site boundary. The closest listed building is 950m south east of the Site boundary.

2.13 There are no statutory ecological designated sites on or within the vicinity of the Site. The closest statutory designated site is the Perivale Wood Local Nature Reserve (LNR), located approximately 2km west of the site. The Grand Union Canal (50m south of the Site boundary) and One Tree Hill recreation ground (230m north of Site boundary) are both designated as Sites of Metropolitan Importance to Nature Conservation (SINC) under the Local Plan.

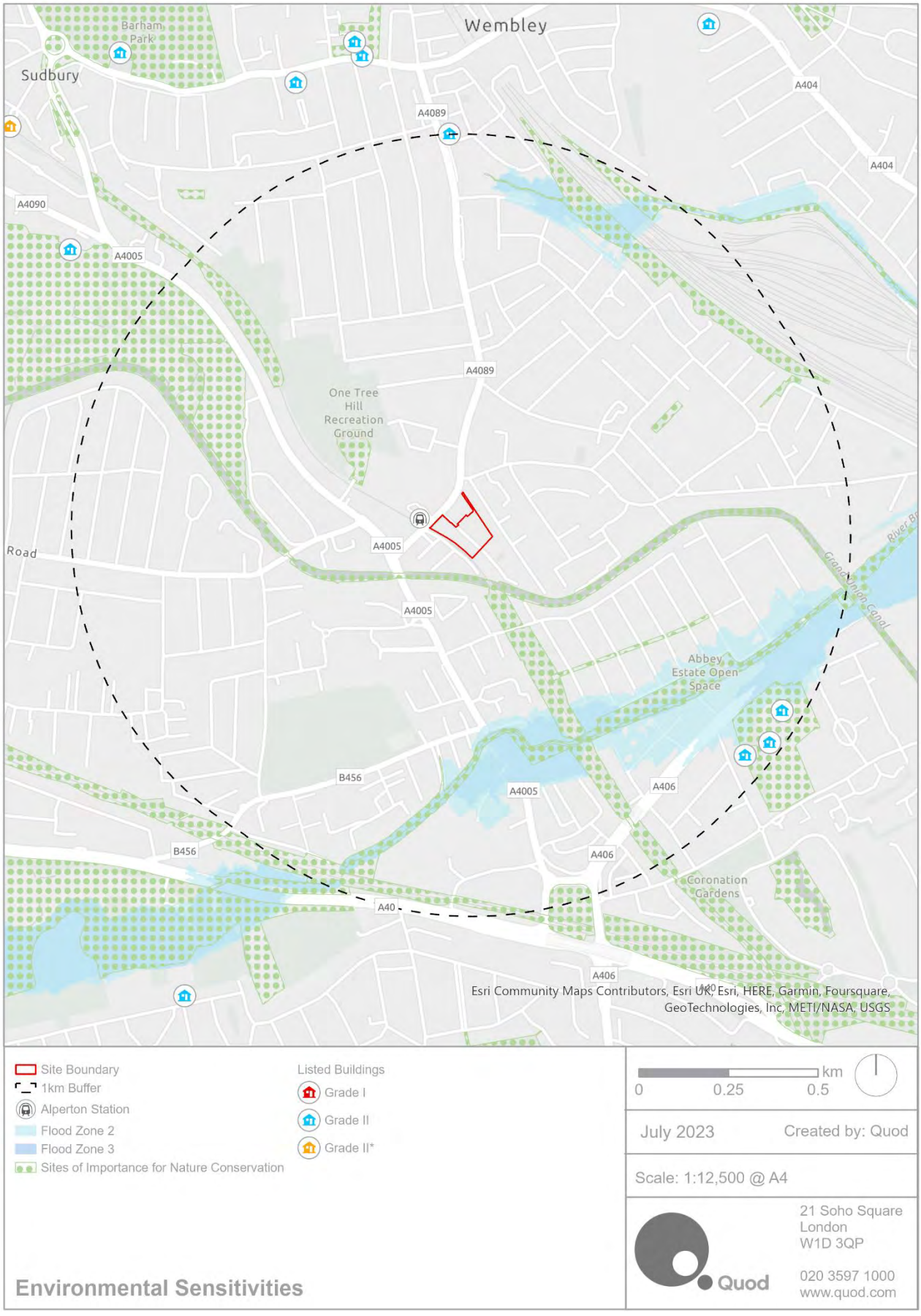
2.14 The Site is not located within or in the vicinity of any statutorily designated views.

2.15 Based on the Environment Agency flood maps, the Site is shown to be located entirely within a Flood Zone 1 where land is assessed as having a low (<0.1%) probability of fluvial flooding. There are no surface water features on-site, however the Grand Union Canal is located approximately 50m south of the Site.

2.16 The entirety of the LPA administrative area is designated as an Air Quality Management Area (AQMA) for exceedances in the 24-hour mean concentration of particulate matter (PM_{10}) and annual mean concentration of nitrogen dioxide (NO_2). The Site therefore lies entirely within the London Borough of Brent AQMA.

[2] Now all part of the National Site Network, as per the 2021 amendments to the Conservation of Habitats and Species Regulations 2017.

Figure 2.1: Environmental Sensitivities within 1km of the Site



3 Description of the Development

Overview of the Application

3.1 The Development proposals are at an early stage of design and will be developed following further technical analysis as part of the EIA process and in consultation with LB Brent and other stakeholders.

3.2 The planning application will be a full application. For the purposes of the EIA, the Development will be defined by a suite of detailed planning drawings accompanied by the design principles set out in a Design and Access Statement.

3.3 The precise description of Development has not been finalised, however is likely to include:

- Demolition of existing buildings on-site;
- Removal of existing car parking;
- Construction of three Blocks (A, B and C), and a standalone community centre, to deliver:
  - Up to 460 residential units (Class C3);
  - Up to 390 co-living units (sui generis);
  - Up to 350 sqm of flexible town centre uses (Class E);
  - Up to 500 sqm of community uses (Class F);
- Three Landscape Character Areas which will deliver amenity areas and playspace.

3.4 An indicative Development layout plan is provided in Figure 3.1. The height and massing is being sensitively designed in line with the site allocation BSWSA3, with the taller heights proposed on the western part of the Site, stepping down in height to the east where there are residential properties along Sunleigh Road. While the heights and massing of the Blocks are subject to design refinement, indicative massing studies have been undertaken and Block A and B will be over 10 storeys in height, with Block C stepping down from 8-10 storeys in height to 4 storeys at the north-east of the Site.

Figure 3.1: Indicative Site Layout

3.5 The main Development access will be from the existing entrances at Ealing Road which joins onto Atlip Road to the north of the Site. It is proposed that the Development will be serviced via Atlip Road. The Development will be 'car-free' with the exception of designated accessible car parking spaces. While this is subject to further design development, it is anticipated that this will equate to 16 blue badge spaces for residents, with one additional space for community centre use. Two car club spaces are proposed, with the potential to deliver a third space should future demand increase. These spaces would be provided on Atlip Road, which will incorporate traffic calming measures and tactile paving. Internal pedestrian routes connecting Atlip Road to each Block and the proposed amenity spaces will be delivered, providing step-free public realm. Pedestrian and cycle access will be prioritised through the landscape proposals and cycle storage will be provided in each of the proposed buildings.

3.6 The landscape and public realm strategy sets out to create a series of new greenspaces which are linked by green streets and lanes to create a permeable network of pedestrian- and cycling-friendly places. Atlip Road will become a tree-lined street, linking to a new central open space, Atlip Gardens. Atlip Gardens will provide areas for amenity and play space, as well as outdoor space for a Community Centre. Communal garden areas are proposed at the periphery of the Site, with provision for gathering spaces, growing and workshop areas, as well as biodiversity and surface water management.

3.7 The Development will incorporate a lean, clean and green energy strategy principles to ensure a low-carbon design.

3.8 Mitigation measures will be incorporated and designed into the Development to address the potential effects on the surrounding land uses. Technical design workshops are currently being undertaken as part of the EIA process to ensure that mitigation measures are incorporated into the design.

Construction

3.9 At this stage, construction of the Development is expected to commence in 2025, with construction expected to be complete in 2030. This represents a build out period of approximately 5 years. Atlip Road will be retained throughout the construction period to allow for access.

3.10 The Applicant has committed to undertaking construction works in line with a Construction Environmental Management Plan (CEMP) as a means of avoiding, reducing or mitigating potential adverse effects of construction on the environment and local community. The CEMP will be subject to approval by LB Brent and secured through an appropriate planning condition.

Schedule of Mitigation

3.11 The EIA Regulations allow mitigation measures, that would avoid or prevent what might otherwise have been significant adverse environmental effects, to be taken into account by the decision maker when considering whether a development is an EIA development. Appendix A provides a summary of standard mitigation measures considered appropriate to mitigate effects with respect to this Development, along with proposed methods of securing these measures through the planning process. As set out later in this Scoping Report, reliance on these controls has been taking into account, as appropriate, during consideration of those topics proposed to be scoped out of the ES.

4 EIA Methodology

Introduction

4.1 The ES will be prepared in compliance with the EIA Regulations. Reference will also be made to current EIA good practice guidance. This section outlines the general approach to the EIA process.

Consultation and Scoping Opinion

4.2 A programme of consultation with key stakeholders will be undertaken with statutory and non-statutory consultees throughout the Development design and in the lead up to the planning application. Key stakeholders include LB Brent Environmental Health Officers for noise and air quality, LB Brent Planning Officer for townscape and biodiversity net gain, Transport for London (TfL) and Thames Water.

4.3 In line with the EIA Regulations, the ES will be 'based on' the Scoping Opinion provided by LB Brent. Each ES topic chapter will set out key points made during scoping correspondence between the project team and stakeholders and will explain how these have been addressed by the EIA process.

Alternatives

4.4 In accordance with the EIA Regulations, the ES will provide *"a description of the reasonable alternatives…. relevant to the proposed project and its specific characteristics which have been considered by the Applicant and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects"*.

4.5 The ES will describe the reasonable alternatives to the Development which have been considered by the Applicant, including:

- The 'do-nothing' scenario - this will outline the consequences of no Development taking place and the Site remaining in its current form; and
- Alternative designs – for example, alternative building layouts, building heights and massing, together with the justification for the selection of the final design.

4.6 Alternative sites have not been considered as the Applicant owns the Site. As such, alternative sites will not be considered in the ES.

EIA Methodology

Significant Effects and Scope of the EIA

4.7 As highlighted by the UK Government Online Planning Practice Guidance[5] (PPG), where considering the scope of EIAs, local planning authorities *"should limit the scope of the assessment to those aspects of the environment that are likely to be significantly affected"*.

4.8 With respect to identifying the likely significant environmental effects associated with the Development, consideration is given to potential effects associated with the construction phase and completed Development. These effects could be both beneficial and adverse and deemed to be 'significant' based on:

- The value / importance of the resources and receptors that could be affected;
- The predicted magnitude of environmental change and / or impact experienced by these resources and receptors, accounting for their size, duration and spatial extent;
- The susceptibility or sensitivity of resources / receptors; and
- Options for avoiding, reducing, offsetting or compensating for any potentially significant adverse effects and the likely effectiveness of such mitigation measures.

4.9 The proposed scope of the EIA has been defined through desktop study, a review of the scheme proposals and professional judgement from the consultant team.

4.10 Sections 5 to 8 set out those aspects of the environment that are likely to be significantly affected by the Development. Potential effects deemed to be non-significant within topics are also set out within these sections. sets out those aspects of the environment that are unlikely to be significant and therefore will be scoped out of the ES.

Study Area

4.11 The study area for each topic will be based on the geographical scope of the potential for significant effects relevant to the topic or the information required to assess the likely effects, as well as topic-specific guidance and consultation with stakeholders. Further detail is provided in the technical sections (Sections 5-8).

Baseline and Future Baseline Conditions

4.12 Baseline environmental conditions need to be established to enable an accurate assessment of potential changes to such conditions that may occur and to assess the likely significant environmental effects of the Development. Understanding baseline conditions is important for the identification of the most appropriate mitigation which could be employed to reduce any likely significant adverse effects.

4.13 Baseline conditions will be taken as the current conditions on the Site. Baseline information is already being gathered through desk-based research and Site surveys conducted in 2023 to define and describe the existing environmental characteristics and receptors for each environmental topic that will be provided within the ES. Where environmental information and data is not available for 2023, it will be necessary to use data which pre-dates 2023. The ES will set out what year the baseline data is sourced from.

4.14 The EIA Regulations require an outline of the likely evolution of the baseline condition without implementation of the Development, as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge (i.e. the 'future baseline'). The future baseline will take into account other developments that will be built out that may affect the Site. The future baseline conditions will be described in each chapter of the ES.

Approach to Mitigation

4.15 During the EIA and design process, the design will appropriately respond to environmental constraints and will seek to include mitigation measures to avoid, prevent, reduce or offset adverse environmental effects. The design will also incorporate opportunities to provide environmental enhancements and improve beneficial effects.

4.16 As set out in IEMA's good practice guidance 'Shaping Quality Development'[6] and 'Delivering Quality Development'[7], mitigation can be categorised as follows:

- Primary Mitigation (Inherent): Modifications to the location or design of the development made during the pre-application stage that are an inherent part of the project, and do not require additional action to be taken. These are an integral part of the proposed development seeking consent and will be outlined in the Description of the Development chapter of the ES and summarised in the topic chapter where relevant;
- Secondary Mitigation (Foreseeable): Actions that will require further activity to achieve the anticipated outcome which may be imposed as part of the planning consent, or through inclusion in the ES, e.g. implementation of a Framework Travel Plan or defining lighting limits; and
- Tertiary Mitigation (Inexorable): Actions that would occur with or without input regardless of the EIA process. These include actions that will be undertaken to meet other existing legislative requirements or standard practices used to manage commonly occurring environmental effects (i.e. construction related nuisances).

4.17 Where assessments identify significant adverse effects, the ES will define mitigation measures and any necessary monitoring.

4.18 The environmental effects of the Development will be assessed taking account of primary mitigation measures.

4.19 The ES will clearly set out secondary and tertiary mitigation measures and how these will be secured and delivered, for example through planning conditions, Section 106 agreement and/or Community Infrastructure Levy agreements. Paragraph 3.9 sets out that the CEMP will be taken into account as tertiary mitigation.

Approach to Construction Assessment

4.20 An indicative construction programme for the Development will be presented in the ES. This will include all aspects of the construction phase including site preparation, construction, fit-out and landscaping works.

4.21 The ES will outline the main activities associated with the construction works, together with the likely duration of each activity. The Applicant has committed to a CEMP, which will be subject to approval by LB Brent and secured through an appropriate planning condition. Mitigation measures for inclusion in the CEMP will be set out in the ES to avoid, reduce or mitigate potential adverse effects.

4.22 In line with IEMA's best practice[8], the CEMP can be defined as 'tertiary' mitigation which is defined as that which *"will be required regardless of any EIA assessment, as it is imposed,*

for example, as a result of legislative requirements and/or standard sectoral practices. For example, considerate contractor practices that manage activities which have potential nuisance effects". As such, the CEMP is considered to be standard practice in the management of the demolition and construction works of the Development. The CEMP will be taken into account and form the basis of the assessment of likely significant effects. As such, any effects that might have arisen without this mitigation will not be identified as 'likely effects', as there should be no potential for them to arise. This should result in a simpler and more proportionate ES.

4.23 Construction is anticipated to last for approximately 5 years. The assessment of construction effects will be based on an assumed 'peak year' of construction activity as a reasonable worst case, when volumes of construction vehicles and on-site activities are likely to be at their highest. Each technical assessment in the ES will assume a notional 'likely-worst case' scenario with respect to the envisaged construction methods, location (proximity to sensitive receptors) and timing. These assumptions may vary between the topic specific assessments, therefore each individual assessment accounts for a 'hypothetical' construction site that is representative of the 'worst-case' scenario for any given set of receptors, relevant to that particular technical assessment. At this stage, the peak year is assumed to be 2030 although this may be subject to change.

Approach to Completed Development Assessment

4.24 The likely significant effects of the completed Development will be assessed for the anticipated year of completion, assumed to be 2030. The assessment will assume that the Development is fully completed and occupied. Even though full occupation may not occur until later, this is unlikely to materially affect whether identified effects are significant or not.

4.25 The completed Development assessment will be based on the suite of detailed planning drawings, accommodation schedules, and design principles set out in the Design and Access Statement submitted with the planning application.

Approach to Cumulative Effects Assessment

4.26 Cumulative effects can occur either when different effects from the Development interact to exacerbate effects on sensitive receptors, or, when the magnitude of an effect is exacerbated by other future neighbouring developments, thus creating a more significant effect, on a receptor.

4.27 It is noted that the Site is located within an area of significant redevelopment, with many upcoming cumulative schemes which will transform the site surrounds to a more high-density mixed-use environment.

4.28 The potential for cumulative effects to arise will be considered in each technical chapter for construction and once the Development is completed and operational. There are six cumulative schemes to be considered as relevant within each technical assessment as follows:

- ID. No. 1 – Minavil House (Ref: 16/2629);
- ID. No. 2 – 330 Ealing Road (Ref. 20/3914);

- ID. No. 3 – Part of Westend Saab (Ref. 21/3941);
- ID. No. 4 – Alperton House (Ref. 18/4199);
- ID. No. 5 – Alperton Manufacturing Estate (Ref. 20/3156); and
- ID No. 6 - Former Northfield Industrial Estate (Grand Union) (Ref. 18/0321).

4.29 Further details of these cumulative schemes including their description of development and current development status are provided in Section 9.

Summary of Assessment Scenarios

4.30 Table 4.1 summarises the potential assessment scenarios.

Table 4.1: Assessment Year and Scenarios

Assessment Year	Scenario	Scenario Description
2023	Baseline	Existing baseline conditions
2027	Peak construction year	2023 baseline + peak construction activities + cumulative schemes
2030	Future Baseline (i.e. Without Development)	2023 baseline + cumulative schemes
	Completed Development	2023 baseline + completed Development + cumulative schemes

Determining the Significance of Effects

4.31 Determining the significance of environmental effects is intended to inform decision making. The significance of effects will be determined by specialists with reference to generic assessment criteria or subject-specific criteria for each environmental topic. These criteria will apply a common terminology, classifying whether the effects are major, moderate or minor, as well as, adverse, negligible or beneficial, temporary or permanent, in line with standard practice.

Scoping Summary

4.32 This scoping exercise has been informed by desk-based research, physical surveys, professional judgement and other information available for the Site. Table 4.2 provides a summary of the scoping exercise.

4.33 In accordance with the EIA Regulations, all assessments will be prepared by consultants considered to have competent expertise in their discipline.

Table 4.2: EIA Scoping Summary

Technical Topics	Potential Significant Construction Effects	Potential Significant Operational Effects	Comments
Socio-economics	✓ - T	✓ - P	ES Chapters to be prepared
Wind Microclimate	✓ - T	✓ - P	
Daylight, Sunlight and Overshadowing	✓ - T	✓ - P	
Townscape, Heritage and Visual Impact	✓ - T	✓ - P	
Transport and Access	X	X	Topics scoped out of the ES
Air Quality	X	X	
Noise and Vibration	X	X	
Biodiversity	X	X	
Ground Conditions and Contamination	X	X	
Water Resources and Flood Risk	X	X	
Agriculture, Land Quality and Soils	X	X	
Climate Change and Greenhouse Gases	X	X	
Human Health	X	X	
Waste and Materials	X	X	
Vulnerability to Major Accidents or Disasters	X	X	
Energy and Sustainability	X	X	
Utilities	X	X	
Light Pollution	X	X	
Telecommunications	X	X	
Aviation	X	X	
Electromagnetic Fields	X	X	

Key: ✓ Likely Significant Effect / X No Likely Significant Effect. T – Temporary Effect / P – Permanent Effect

Structure of the ES and Technical Chapters

4.34 The proposed structure of the ES is presented in Table 4.4.

Table 4.4: Structure of the Environmental Statement

Chapter Number	Chapter Title
ES Volume I	
Chapter 1	Introduction
Chapter 2	Site and Setting
Chapter 3	EIA Methodology
Chapter 4	Alternatives
Chapter 5	Description of Development
Chapter 6	Demolition and Construction
Chapter 7	Socio-economics
Chapter 8	Wind Microclimate
Chapter 9	Daylight, Sunlight and Overshadowing
ES Volume II	
Townscape, Heritage and Visual Impact Assessment	
ES Volume III	
Technical Appendices	

4.35 Each environmental topic scoped into the EIA will be structured as set out in Appendix C.

5 Socio-Economics

Baseline Conditions and Study Area

Study Area

5.1 The Site is in the Alperton ward within the administrative area of LB Brent.

5.2 The baseline assessment will consider relevant social and economic conditions for the Site (where data is available) and the Local Area (defined as 'Alperton ward') which will be put into context against the wider borough (LB Brent) and London profile.

Baseline Conditions

5.3 The Site is currently occupied by the following existing uses:

- London Shootfighters;
- The Gym Group;
- The Clay Oven (Banqueting Hall);
- Commercial premises.

5.4 The baseline assessment will consider the level of existing employment on Site. If the actual level of employment is not known to the Applicant, the assessment will estimate the potential employment capacity of the uses on-site by applying standard job density ratios from the Homes and Communities Agency Guidance (2015)[9] to the existing floorspace.

5.5 The socio-economic baseline will draw on a range of data sources to establish the prevailing socio-economic conditions, including (but not limited to):

- 2011 Census[10];
- 2021 Census[11];
- Business Register and Employment Survey (2022)[12];
- Claimant Count (2023)[13];
- Housing delivery data from London Plan Annual Monitoring Reports;
- Annual Schools Census data (2022 or 2023 (new data expected in Summer 2023))[14] and information from LB Brent school admission documents;
- Data on local GP practices from NHS Digital[15]; and
- Open space and playspace information from Ordnance Survey data[16], alongside a desktop study.

5.6 Where more up-to-date data is available than is stated here, this will be utilised.

Future Baseline

5.7 The future baseline will establish projected population growth using ONS data and will consider any planned future provision/capacity of social infrastructure (e.g., school places) expected to be delivered by 2030 (when the Development is anticipated to be complete and operational).

Assessment Scope

Key Receptors

5.8 The following receptors are considered sensitive to potential likely significant effects arising from the Development:

- The Site's existing business and community uses, their employees and customers/ users;
- The construction industry and its employees;
- The local economy and labour market i.e. local businesses and economically active residents;
- The local housing market (housing need within the borough);
- Local social infrastructure and its users, specifically:
  - Primary schools within 1km of the Site and within Primary School Planning Area 3 (in line with LB Brent's School Place Planning analysis[17]);
  - Secondary schools across the borough (baseline data include a summary of capacity within Secondary School Planning Area West within which the Site falls). Given the proximity of the Site to the borough boundary, the closest secondary schools over the borough border in the London Borough of Ealing will also be considered;
  - GP surgeries within 1km of the Site; and
  - Open space and playspace within 800m of the Site.
- New residents and employees to be accommodated by the Development.

Likely Significant Effects

Demolition and Construction

5.9 The assessment will consider the following potential likely significant effects:

- Displacement of existing on-site employment;
- Displacement of existing community uses; and
- Generation of temporary employment during the demolition and construction period.

Completed Development

5.10 The assessment will consider the following potential likely significant effects:

- Employment opportunities arising from provision on non-residential floorspace;

- Provision of new non-residential uses;
- Delivery of new homes contributing to local housing targets;
- The effect of the population accommodated by these new homes on social infrastructure – specifically education, primary healthcare, open space and playspace provision; and
- Spending effects associated with the new residents and net employees brought to the Site by the Development.

Cumulative Assessment

5.11 The cumulative assessment will assess the combined socio-economic effects of the Development and cumulative schemes identified within Section 9. The cumulative assessment will consider the same potential likely significant effects as identified for the Development (outlined above); however, they will not be assessed in the same level of detail as the main assessment, as discussed below.

Demolition and Construction

5.12 The assessment will consider all cumulative schemes set out in Section 9, as the construction industry and its employees are best assessed at the regional level.

5.13 The impact of cumulative schemes on demolition and construction will be considered qualitatively. It is not possible to make a quantitative assessment of cumulative construction employment. Variance in methodologies between projects for calculating construction jobs means that inaccuracies would arise from summing available figures. Construction projects do not always occur concurrently due to differences on commencement date, programme length and potential stalling of projects. Fluctuation in the intensity of labour demand on construction sites can also enable contractors to move around between sites. Therefore, the employment generated through the construction of the cumulative schemes may not occur at the same time in a cumulative manner.

Completed Development

5.14 The assessment will consider cumulative schemes which impact upon socio-economic sensitive receptors. The proposed baseline for social infrastructure establishes the provision within reasonable travel distances or catchments which are relevant to each type of infrastructure (e.g. 1km for primary healthcare). It is assumed that the population of the cumulative developments would have a different, albeit overlapping, access to social infrastructure compared to the Development. Therefore, while the population and child yield would have an effect on the baseline, the difference in catchment areas would mean this effect is felt among a wider range of facilities. The effect of these schemes on the baseline in future is therefore uncertain and cannot be meaningfully defined in isolation from a comprehensive modelling of the wider borough school and health system. Therefore, the quantitative assessment of effects on social infrastructure are scoped out of the cumulative assessment and will be considered qualitatively.

Non-Significant Effects

Demolition and Construction

5.15 Indirect construction effects such as supply chain effects and spending by construction workers are not likely to be significant. The number of construction workers would fluctuate on-site over the course of the programme, as such it will not be possible to quantify the level of spending captured locally.

5.16 It is also not possible to quantify supply chain and procurement effects as the level of information required will not be available at the planning application stage. The spatial context of supply chain effects can range from local to national and even international depending on the supply and sourcing of construction materials. Whilst these effects are likely to be beneficial, they are unlikely to be significant.

Completed Development

5.17 It is not possible to undertake a quantitative assessment of the Development's impact on the capacity of nurseries, leisure and other community facilities in the same way as for schools and GP surgeries. This is because the take up and usage of these types of facilities varies and cannot be accurately predicted or measured. The effect of the Development on these types of facilities is not expected to be significant.

Assessment Methodology

5.18 The assessment of potential likely significant effects will be undertaken using the following methodology and/or tools:

- Displacement of existing on-site employment will be considered in the context of the local labour market and economy;
- Demolition and construction-related employment effects will be assessed using the Construction Industry Training Board (CITB) Labour Forecasting Tool[18];
- Direct operational employment effects will be assessed by applying standard job density ratios from the Homes and Communities Agency Guidance (2015)[19]. The assessment will also consider the net employment effect over the baseline position on the Site;
- Delivery of housing will be assessed against London Plan policy targets for the borough;
- The estimated resident population (including child yields) arising from the Development will be calculated using the GLA's Population Yield Calculator (v 3.2)[20] applying Outer London geography and PTAL rating of 4;
- Demand for education will be assessed by considering primary and secondary age child yield against existing capacity in schools surrounding the Site;
- The Healthy Urban Development Unit (HUDU) benchmark of 1,800 registered patients per NHS General Practitioner (GP)[21] and the London average list size of 2,000 patients per GP will be used to assess existing GP capacity against demand arising from the Development;

- Private amenity space will be assessed against LB Brent's Local Plan Policy BH13 'Residential Amenity Space' requirements. This states that 50 sqm of private amenity space will be required per family home (3+ beds) and 20 sqm of space for all other sized homes;
- Playspace requirement will be calculated using the GLA's Population Yield Calculator (v 3.2). Calculated demand will be considered against planned provision within the Development in line with the GLA's SPG on Play and Informal Recreation (2012) standards[22]; and
- An estimate of spending generated as a result of the completed Development would be calculated using average household spending figures[23] and an average figure for daily worker spending[24].

6 Wind Microclimate

Baseline Conditions and Study Area

Study Area

6.1 The study area comprises the Site and its immediate surroundings within an approximately 360m radius from the centre of the Site. The assessment will cover the critical pedestrian-level locations including building entrances, walkways, sitting areas, drop-off locations, bus stops, disabled parking bays, queuing areas, upper-level terraces, balconies, and other frequently used locations.

Baseline Conditions

6.2 Based on the long-term wind climate statistics from Heathrow and London City Airports, combined and corrected to represent the winds over the Site, the prevailing winds at the Site are predominantly from the south westerly sector. Strong winds are generally more frequent during winter when the most frequent strong winds blow from the south west. Wind speeds are generally lower magnitude during the summer months. North easterly winds are common during spring but are generally lighter compared to the south westerly winds in other seasons.

6.3 The Development would be taller than the surrounding development and therefore exposed to the prevailing winds. The wind conditions in and around the existing Site are likely to be suitable, in terms of pedestrian comfort and safety, for the existing uses. The wind conditions in and around the Site will be assessed in detail based on the methodology outlined below for the Development.

Future Baseline

6.4 Any longer-term changes in the wind environment are expected to be subtle and are not expected to materially affect the suitability of wind conditions over the lifespan of the building.

Assessment Scope

Key Receptors

6.5 The assessment will consider the potential effects on pedestrian amenity in the areas that the public and users of the Site would be reasonably expected to utilise. This includes:

- On-site thoroughfares delivered as part of the Development, including new pedestrian routes;
- Off-site thoroughfares and walkways including Ealing Road, Sunleigh Road, Rosemont Road and Atlip Road;
- On-site and off-site entrances to buildings within the Study Area;
- Balconies and amenity spaces delivered as part of the Development;

- Off-site ground floor amenity spaces including neighbouring properties along Sunleigh Road;
- Podium/roof top terraces delivered as part of the Development;
- Bus stop/other public transport infrastructure at Alperton Station and the bus stops located on Ealing Road;
- Pick-up/drop-off points and pedestrian crossings along Ealing Road, Rosemont Road and Atlip Road..

Likely Significant Effects

Completed Development

6.6 Tall buildings and certain other building forms can induce wind effects that increase local wind speeds. The primary effects that may lead to increased wind speeds include downwash, side streaming, corner accelerations and funnelling. Due to the size and form of the Development, these effects may lead to uncomfortable or unsafe conditions and this will be investigated in the studies proposed.

6.7 The assessment of likely significant wind effects of the Development once completed and operational will include:

- Increased wind speeds on pedestrian areas within or surrounding the Development; and
- A change in the pedestrian activity/comfort within or around the Development; and
- An impact on the safety and comfort of pedestrians using the Development, notably within new areas of the public realm, private outdoor spaces, and at building entrances.

Cumulative Assessment

Completed Development

6.8 The cumulative assessment will assess the likely significant wind effects within and around the completed Development, factoring in the influence of relevant cumulative schemes which are situated within approximately a 360m radius of the centre of the Site as outlined below:

- ID. No. 1 – Minavil House (Ref: 16/2629);
- ID. No. 2 – 330 Ealing Road (Ref. 20/3914);
- ID. No. 3 – Part of Westend Saab (Ref. 21/3941);
- ID. No. 4 – Alperton House (Ref. 18/4199); and
- ID. No. 5 – Alperton Manufacturing Estate (Ref. 20/3156).

6.9 The cumulative assessment will assess the same potential effects as the competed Development assessment above.

6.10 Cumulative schemes beyond the 360m radius are considered to be too far from the Site to result in any cumulative effect; therefore, are excluded from the assessment.

Non-Significant Effects

Demolition and Construction

6.11 The demolition of existing buildings on the Site is not expected to significantly increase the exposure of sensitive surrounding receptors. Potential effects on the local wind microclimate during construction are therefore expected to gradually transition from the existing Site wind microclimate to those of the completed Development, and therefore would not be specific to construction. As such, it is proposed that construction effects will be scoped out of the ES.

Assessment Methodology

6.12 Detailed wind tunnel testing will be undertaken. Wind tunnel testing is the most well-established and robust means of assessing the pedestrian level wind microclimate. It enables the wind conditions in and around the Site to be quantified and classified under the widely accepted Lawson criteria for pedestrian comfort and safety. The London Docklands Development Corporation (LDDC) variant of the criteria will be used in the assessment as the current industry standard.

6.13 A 1:300 scale model of the Development and surrounding buildings will be constructed and tested as a number of configurations in a boundary layer wind tunnel testing facility. Wind tunnel testing delivers a detailed assessment of the mean and gust wind conditions around the Site and within the Development for the tested wind directions. This provides a basis to assess the potential wind microclimate impacts and likely effects of the Development on pedestrian comfort and safety with regards to its intended uses.

6.14 The wind tunnel assessment will include the following scenarios:

- Configuration 1. Baseline: Existing Site with existing surrounding context;
- Configuration 2. Baseline + Completed Development; and
- Configuration 3. Baseline + Completed Development + Cumulative Schemes.

6.15 Through the determination of the suitability for use of the areas surrounding the Site, a direct comparison can then be made with the baseline / existing off-site conditions where target uses remain consistent, and the effect to these surrounding areas assessed, with the scale of effects and whether they are significant or not identified where appropriate.

6.16 The potential for strong winds to occur will also be quantified.

6.17 Should mitigation measures be required to ensure that wind conditions are suitable for their intended use, the areas requiring mitigation will be identified and mitigation measures will be developed. Where necessary, mitigation measures will be tested through additional rounds of wind tunnel studies.

Assessment Criteria

6.18 The measured wind speeds will be analysed in conjunction with the wind frequency statistics at the Site to provide an assessment of the wind environment in terms of pedestrian comfort and safety, according to the Lawson LDDC Criteria[25] (‘Lawson Comfort

Criteria'), which are well-established criteria for assessments of this nature. This will determine the suitability of different areas for sitting, standing, strolling and walking. There is also a fifth, windiest category of 'uncomfortable', where wind conditions would be expected to be unacceptable for any use. The Lawson Comfort Criteria is presented in Table 6.1.

Table 6.1: The Lawson Comfort Criteria

Key	Comfort Category	Threshold Wind Speed	Description
	Uncomfortable	>10m/s	Winds of this magnitude are considered a nuisance for most activities, and wind mitigation is typically recommended.
	Walking	8-10m/s	Relatively high speeds that can be tolerated if one's objective is to walk, run or cycle without lingering.
	Strolling	6-8m/s	Moderate breezes that would be appropriate for strolling along a city/town street, plaza or park.
	Standing	4-6m/s	Gentle breezes acceptable for main building entrances, pick-up/drop-off points and bus stops
	Sitting	0-4m/s	Light breezes desired for outdoor restaurants and seating areas where one can read a paper or comfortably sit for long periods

6.19 Potential for strong winds will also be evaluated, where an exceedance of 15m/s for more than 0.025% of the year (or approximately 2.2 hours per annum) is the threshold.

6.20 The assessment of the likely scale of effect is based on the comparison of the predicted wind conditions at a particular measurement location with the desired pedestrian use of the Site as defined in the Lawson Comfort Criteria. Where appropriate, wind conditions experienced across the Site are also compared against the baseline conditions.

6.21 The following terms would be used to define the significance of the effects identified and apply to both beneficial and adverse effects:

- Major effect: where wind conditions would be three categories calmer/windier than required;
- Moderate effect: where wind conditions would be two categories calmer/windier than required;
- Minor effect: where wind conditions would be one category calmer/windier than required; and
- Negligible: where no discernible improvement or deterioration is expected as a result of the Development and wind conditions would be suitable for the intended use.

6.22 Any adverse effect would be deemed to be a ‘significant effect’ because it implies that a location, or area, has a wind microclimate that is unsuitable for the desired use of that area. On this basis, effects that are adverse require mitigation. Beneficial effects that are minor, moderate or major in scale are not considered to be significant.

6.23 In line with Lawson’s overall methodology, strong winds are reported separately from the comfort assessment and do not form part of the scale of effect criteria. This is due to the fact that any strong wind exceedance is considered to be significant regardless of its scale.

6.24 For off-site areas, wind conditions are compared to the baseline scenario and the intended use. If wind conditions remain consistent or calmer than the baseline scenario or remain suitable for the intended use, this would represent a negligible effect. However, if wind conditions around the Site become windier than the baseline scenario and unsuitable for the intended use, the effect would be significant. Wind conditions off-site will only be classified as beneficial if wind conditions were not suitable for the intended use in the baseline scenario and are improved to be calmer than required for the intended use with the Development completed. If conditions are windier than the baseline, but remain suitable for the intended use, this would remain a negligible effect.

7 Daylight, Sunlight and Overshadowing

Baseline Conditions and Study Area

Study Area

7.1 The study area for the assessments is considered to be the residential accommodation, amenity areas and transport routes in the immediate vicinity of the Site that may be affected by the newly introduced massing of the Development.

7.2 The principal recommendations in the BRE guide for the assessment of the effects of development on daylight and sunlight to existing surrounding buildings relate to residential buildings. The guidelines on daylight are intended for use for rooms where daylight is required, including living rooms, kitchens and bedrooms (paragraph 2.2.2 of the BRE guide). The guidelines on sunlight apply to all main living rooms and conservatories that have a window facing within 90˚of due south (paragraph 3.2.3 of the BRE guide). The daylight and sunlight assessment will be scoped to include all habitable rooms in nearby residential buildings, or residential parts of mixed-use buildings, surrounding the Site.

7.3 The BRE guide recommends assessing sunlight to main back gardens of houses, allotments, parks and playing fields, children's playgrounds, outdoor swimming pools, sitting-out areas such as in public squares, and focal points for views, such as a group of monuments or fountains. Front gardens, driveways and hard standing for cars are usually omitted.

Baseline Conditions

7.4 The Site is currently occupied by two relatively low-rise commercial properties, together with associated car parking.

7.5 The surrounding area comprises of a mix of uses. Across the railway lines to the south of the Site are commercial / light industrial uses, together with a new developed residential-led development. Across Ealing Road to the north of the Site are the London Underground Station and Alperton School. Immediately adjacent to the Site and to the north is a commercial building and mixed use / residential apartment blocks. Adjacent to the Site to the south are residential apartment blocks. To the east of the Site are residential terrace houses.

7.6 Given the predominantly low-rise nature of the existing buildings on-site, the existing surrounding buildings receive relatively high levels of light and low levels of overshadowing for an urban area.

Future Baseline

7.7 Any alterations made to the properties surrounding the Site have the potential to change the surrounding baseline condition.

7.8 A review of emerging development in the area was undertaken (see Section 9) and a number of schemes sit in proximity to the Site and will be included within the future baseline from the assessment (see 'Cumulative Assessment' section below).

Assessment Scope

Key Receptors

Daylight and Sunlight

7.9 The daylight and sunlight analysis will focus on sensitive residential properties that may have their existing levels of light affected by the Development. A desk-top review of the surrounding area indicates the following properties as potentially relevant for assessment:

- Existing receptors – Bigler Court;
- Existing receptors - Dawsons Court;
- Existing receptors - Hayes Court;
- Existing receptors - 25 Ealing Road;
- Existing receptors - Alperton Community School;
- Existing receptors - Windsor House;
- Existing receptors - 2-50 Sunleigh Road (even nos. only);
- Existing receptors - 9-31 Sunleigh Road (odd nos. only).;
- Future residential receptors at nearby cumulative schemes as relevant.

Overshadowing

7.10 The overshadowing analysis to neighbouring receptors will focus on sensitive public and private amenity spaces, and any sensitive ecological receptors located to the north, east and west of the Site. Areas located to the south are not considered sensitive due to the sun-path not casting shadows to the south. A desk-top review of the surrounding area indicates the following properties as potentially relevant for assessment:

- Existing receptors – Rear gardens serving 2-50 Sunleigh Road;
- Existing receptors - Rear gardens serving Hayes Court; and
- Existing receptors - Open space serving Alperton Community School.

Likely Significant Effects

Completed Development

7.11 The completed Development will introduce new buildings onto the Site of various heights and massing. These new buildings may have the potential to affect light levels to existing surrounding residential receptors, as well as overshadowing to surrounding amenity spaces.

7.12 The potential daylight and sunlight effects to be assessed within the ES are:

- Loss of natural daylight to adjacent properties;

- Loss of natural sunlight to adjacent properties; and
- Overshadowing of public / private external amenity space.

Non-Significant Effects

Demolition and Construction

7.13 The assessment of the completed Development constitutes the worst-case assessment of daylight, sunlight and overshadowing effects. Given that proposed massing will be built out to the greatest extent in the completed Development scenario, an assessment of effects during the demolition and construction works is not considered necessary. As such, construction effects will be scoped out of the ES.

Completed Development

7.14 An internal daylight, sunlight and overshadowing assessment (i.e. within the Development) is considered a design consideration rather than an environmental impact issue and will therefore not be considered in the EIA. An internal daylight and sunlight report as well as an internal overshadowing assessment will be prepared and submitted separately to the EIA as part of standalone documents.

7.15 There is no specific criterion for assessing the significance of solar glare or dazzle and professional judgment has therefore been used in establishing whether the Development is likely to give rise to significant effects. The facades of the Development are not anticipated to contain an unusual level of reflective material. The incidents of solar glare at certain times of the day / year are therefore unlikely to be significant in effect and can be considered without the need for detailed technical analysis. The potential for significant effects would be minimised throughout the design process through technical input and would be reviewed further as the design develops. Consequently, it is considered that solar glare can be scoped out of the EIA.

Cumulative Assessment

Completed Development

7.16 A review of the cumulative schemes provided within Section 9 was undertaken. Due to their proximity to the Site and the existing sensitive receptors, the following cumulative schemes will be considered in the assessment:

- ID. No. 1 – Minavil House (Ref: 16/2629);
- ID. No. 2 – 330 Ealing Road (Ref. 20/3914);
- ID. No. 3 – Part of Westend Saab (Ref. 21/3941);
- ID. No. 4 – Alperton House (Ref. 18/4199); and
- ID. No. 5 – Alperton Manufacturing Estate (Ref. 20/3156).

7.17 The future residential occupants of these schemes will be considered as potentially sensitive future receptors. On this basis, both a Future Baseline Scenario and Cumulative Scenario will both be assessed.

7.18 The remaining cumulative schemes are deemed to sit too great a distance from the Site, such that an impact on daylight, sunlight and overshadowing is unlikely.

Assessment Methodology

7.19 The approach and methodologies used for the assessment of daylight, sunlight and overshadowing assessments will be in line in the Building Research Establishment publication 'Site Layout Planning for Daylight and Sunlight a guide to good practice' 2022 (the 'BRE Guidelines').

7.20 The baseline conditions will be described in the Daylight, Sunlight and Overshadowing (DSO) chapter of the ES.

7.21 A measured survey has been undertaken to gather accurate information of Site and surrounding context. This will be used to build the test environment used within the DSO assessment.

Daylight and Sunlight

7.22 With regard to daylight and sunlight, paragraph 2.2 of the BRE Guidelines states that:

"The guidelines given here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, store rooms, circulation areas and garages need not be analysed."

7.23 In accordance with this guidance, the sensitive receptors that will be assessed are habitable rooms in residential dwellings, where the occupants have a reasonable expectation of daylight and sunlight. The properties that will be considered within the assessment are set out above under the 'Key Receptors' section.

7.24 A relevant factor when considering the significance of effect is the adequacy of the retained light within the neighbouring dwellings. This is especially relevant in an emerging urban context such as where the buildings are currently low rise, but higher density schemes are emerging surrounding the Site. The BRE Guidelines allow for alternative target values to be considered when applying significance in such situations. Appeal decision precedent indicate that retained Vertical Sky Component (VSC) levels in the mid-teens would be acceptable in urban environments and levels in excess of 20% would be reasonably good. As such, where there are retained VSC values in excess of 15% the significance of effect would tend towards being minor adverse.

7.25 Regard will also be had to neighbouring residential developments that are coming forward (i.e. the cumulative schemes). This will be considered both in terms of the impacts of the Development on daylight and sunlight levels in relevant receptors within these schemes and the cumulative impacts of the Development in combination with these schemes, on other local sensitive receptors. The cumulative schemes that will be considered within the EIA are detailed in Section 9.

7.26 To inform the baseline analysis, a digital 3D model of the existing baseline scenario will be constructed. The model will be analysed to ascertain the baseline levels of daylight and

sunlight amenity within the surrounding residential properties by reference to the VSC, No Sky Line (NSL) and Annual Probable Sunlight Hours (APSH) methods.

7.27 For the individual and cumulative impact assessments, the 3D model will include the Development (once completed) and relevant cumulative schemes. Both VSC and NSL assessments of surrounding residential receptors will be undertaken for the individual and cumulative impact assessment scenarios. When considering future receptors, the BRE Guidelines suggest that Average Daylight Factor (ADF) may be a more appropriate form of assessment to review the adequacy of daylight. The results will be analysed in the context of the established baseline conditions. In addition, the effect of the Development on any receptors within the cumulative schemes will be assessed.

Overshadowing Effects on Surrounding Receptors

7.28 The overshadowing assessment will comprise a Sun Hours on Ground assessment and a transient overshadowing assessment. The receptors sensitive to overshadowing effects set out above under the 'Key Receptors' section.

7.29 The method for assessing sun on the ground is the 'sun-on-ground indicator'. The BRE Guidelines suggest that the Spring Equinox (21st March) is a suitable date for the assessment. Using specialist software, the path of the sun is tracked to determine where the sun would reach the ground and where it would not. This assessment reviews the total percentage of an area that receives at least 2 hours of direct sunlight on 21st March. The BRE Guidelines recommend that at least 50% of each amenity area should receive 2 hours of sunlight on 21st March.

7.30 The BRE Guidelines suggest that where large buildings are proposed which may affect a number of gardens or open spaces, it is useful to plot a shadow plan to illustrate the location of shadows at different times of the day and year. For the Transient Overshadowing assessment, the path of the shadow will be mapped for the following three key dates in the year:

- 21st March (Spring Equinox);
- 21st June (Summer Solstice); and
- 21st December (Winter Solstice).

7.31 For each of these dates, the overshadowing would be illustrated at hourly intervals throughout the day from 08:00 to 19:00. Some images will not be included because the sun will not be present during these times (e.g. from approximately 16:00 onwards on 21st December) and thus no shadow can be cast.

Solar glare analysis

7.32 As there is no set guidance for applying significance to solar glare effects, the following criteria for the scale of effect is based on professional judgement:

- Negligible: Glare angles greater than 30°, as reflections beyond this angle are normally not intense enough to cause glare (CIE), or between 10° and 30° for brief periods of time;

- Minor adverse: Glare angles between 10° and 30° for long periods of time or between 3° and 10° for a short period of time;
- Moderate adverse: Glare angles between 3° and 10° for a long period of time; and
- Major adverse: Solar reflections with glare angles smaller than 3°.

8 Townscape, Heritage and Visual

Baseline Conditions and Study Area

Study Area

8.1 The study area for designated heritage receptors will take in an area of 1km from the Site boundary. In addition, non-designated heritage receptors will be assessed within a radius of 500m from the Site boundary. There are seven heritage receptors within this radius, including one Conservation Area (Canalside CA) and three Grade II listed buildings (within the Twyford Abbey complex to the south east of the Site). Identification of the heritage receptors for assessment was informed by a review of surrounding building locations and heights, topography, townscape features and an understanding of the scale of the Development and whether there is likely to result in a change to the setting of the heritage receptors. The Heritage Asset Plan is reproduced at Appendix B.

8.2 The study area for townscape receptors will take in an area of 1km from the Site boundary. This study area was informed by a review of surrounding building locations and heights, topography, townscape features and an understanding of the scale of the Development. It was also informed by a Zone of Theoretical Visibility (ZTV) and Candidate View Study (CVS) which was prepared using the emerging heights of the Development. The Townscape Character Area Plan is reproduced at Appendix B.

8.3 The visual study area was not defined in the same way. Viewpoints proposed for assessment were informed by an analysis of the street structure and townscape character (i.e., where there is likely to be a direct line of sight), open spaces or other public areas, the ZTV and CVS and the key views identified in the LB Brent local plan, draft local plan and SPDs (including CA appraisals if relevant) and the London View Management Framework (2012) (LVMF). The Site does not fall into any LVMF views. The proposed viewpoint locations were also informed by a site visit in June 2022. The selection of views has been agreed during pre-application consultation with LB Brent. The Proposed View Location Plan is provided in Appendix B: Proposed Viewpoint Locations, Heritage Asset Plan and Townscape Character Plan.

Baseline Conditions

8.4 The Site is bound on the south west side by the Piccadilly line, which runs along raised railway arches between Ealing Road and the canal. To the east, the Site is backed onto by inter-war semi-detached residential development.

8.5 The Site currently comprises the Atlip Centre (a three-storey building including a mix of small retail units, a gym, and banqueting suites) together with hard surfaced parking areas and a former retail warehouse to the rear. The Site covers a section of Atlip Road providing access from Ealing Road, and a disused pedestrian access running through the Site.

8.6 The Local Plan identifies the Site as located within the BSWGA1 Alperton Growth Area. This policy supports the regeneration of the area principally focused along the Grand Union

Canal. It is acknowledged that the area will be a location for tall buildings at its Ealing Road and Northfields ends, with more mid-rise in between.

8.7 The Site is not located in close proximity to any designated heritage assets. The closest listed buildings are located in the Twyford Abbey complex (grade II listed Twyford Abbey and associated grade II listed chapel and garden walls), around 900m to the south east. There is one conservation area (CA) within 500m of the Site: the Canalside CA to the west. Despite the significant distance between the Site and these heritage assets, there is opportunity for the setting of heritage assets to be impacted by the proposals, even in the emerging context of tall buildings. Furthermore, Alperton Station, which is located opposite the Site, is a locally listed building and will therefore be assessed as a non-designated heritage asset. See the Heritage Asset Plan in Appendix B: Proposed Viewpoint Locations, Heritage Asset Plan and Townscape Character Plan. Early view testing will help inform a design approach that is sensitive to the setting of heritage assets.

8.8 The baseline condition of the receptors will be described in terms of their significance through their architectural and artistic or historic interest, and the contribution setting makes to their significance.

Future Baseline

8.9 The cumulative schemes identified in Section 9 will be considered in the context of a future baseline. Where cumulative schemes have been implemented or are under construction these will form part of the future baseline.

Assessment Scope

Heritage

8.10 The potential effects of the Development on the significance of surrounding heritage assets will be assessed. The designated and non-designated heritage assets comprise conservation areas, listed buildings and locally listed buildings identified by LB Brent. Those which are likely to be affected by the Development through a change to their setting, based on site studies, will be assessed.

8.11 Heritage receptors within 1km have been plotted as described above, and the Heritage Asset Plan is reproduced in Appendix B: Proposed Viewpoint Locations, Heritage Asset Plan and Townscape Character Plan. Due to the lack of a historic functional relationship with the Site, and significant separating distances between the Site and the designated heritage assets, it is not anticipated that the Development will result in a significant change to the settings of the heritage receptors. Notwithstanding, due to the scale and height of the Development, all the heritage receptors identified in the Heritage Asset Plan will be assessed.

8.12 The assessment will provide an analysis of the impact of the Development on the baseline conditions of the receptors.

8.13 The following CAs will be assessed:

- Canalside CA.

8.14 The following listed buildings will be assessed:

- Church of St Mary (Grade II);
- Garden Wall to North of Twyford Abbey (Grade II); and
- Twyford Abbey (Grade II).

8.15 The following locally listed buildings will be assessed:

- Alperton Station;
- 2-4 Stanley Avenue; and
- 1-3 Stanley Avenue.

Townscape

8.16 Townscape is the *"built up area, including the buildings, the relationships between them, the different types of urban open spaces, including green spaces, and the relationship between buildings and open spaces"*, as defined in GLVIA3. Townscape receptors within 1km of the Site boundary will be assessed. They are defined as townscape character areas.

8.17 There are nine townscape character areas which are identified for assessment. They are represented on the Townscape Character Area Plan provided at Appendix B and comprise:

- Character Area 1 - Alperton Central Industrial / Tall Building Zone;
- Character Area 2 - East Alperton Inter-war residential;
- Character Area 3 - South Alperton Residential;
- Character Area 4 - Alperton Station and Ealing Road Commercial;
- Character Area 5 - One Tree Hill residential / Sudbury Golf Club;
- Character Area 6 - Wembley Intercity Depot;
- Character Area 7 - North Circular Industrial / Retail Estate;
- Character Area 8 - Hanger Lane Industrial / Retail Estate; and
- Character Area 9 - Perivale Residential.

8.18 The townscape character assessment leads to the identification and description of character areas / types and their key characteristics which can be mapped with boundaries. The mapped boundaries suggest a sharp change from one townscape area. In practice, however, this often represents a zone of transition.

Views

8.19 The study area for the visual assessment is centred on the Site and will be limited to locations from which the Site can be seen, or from which the new buildings on the Site have the potential to result in significant visual impact at the heights proposed. The verified views will be prepared by AVR London in accordance with their industry standard methodology.

8.20 The set of viewpoints cover:

- Any protected views;

- The range of points of the compass from which the Development will be visible;
- A range of distances from the Site; and
- Different types of townscape areas.

8.21 Table 8.1 contains the draft viewpoints and highlights the corresponding number on the View Location Plan in Appendix B: Proposed Viewpoint Locations, Heritage Asset Plan and Townscape Character Plan . The viewpoint plan was derived from modelling work and field inspection, including a ZTV and CVS generated using VUCITY software, and includes both views identified in relevant policy documents, those with a particular heritage, or townscape/amenity interest or value and those requested by LB Brent. The selection and scope of viewpoints is considered proportionate to the nature of the proposals and heritage and townscape context.

8.22 Views included within Table 8.1 are views that are proposed to be included within the EIA for assessment. All the views scoped during pre-application stages will be assessed in the ES Chapter.

Table 8.1: Proposed Viewpoints

No.	Viewpoint Name
1	Stanley Avenue
2	Kathleen Avenue
3	One Tree Hill Recreation Ground
4	Alperton Cemetery
5	Grand Union Canal
6	Junction of Ealing Road
7	Alperton Sports Ground
8	Abbey Avenue
9	Woodside Close
10	Lyon Park Primary School Playing Fields
11	Mount Pleasant Open Space
12	Twyford Abbey driveway
13	Sudbury Golf Club
14	Mount Pleasant / Ealing Road
15	Alperton Baptist Church
16	Regents Canal southeast
17	Regents Canal southeast 2
18	Regents Canal east
19	Regents Canal southwest
20	Regents Canal, Venice House
21	Alperton Station approach
22	Sunleigh Road
23	Atlip Road
24	Hanger Lane Station
25	Horsenden Hill

8.23 The views will be prepared in accordance with TGN 06/19 Visual Representation of Development Proposals which was published by the Landscape Institute in 2019[26]. The render types (wireline AVR1 or render AVR3) will be agreed in consultation with LB Brent.

8.24 It is noted that due to landform and height of the buildings proposed, the Development may be visible over significant separating distances and from locations not identified in the visual assessment. It is considered the Development will not affect such visual receptors in a significant way and the Development will form background elements in such views, and from some locations be experienced as part of a wider urban townscape that includes taller buildings.

Likely Significant Effects

Demolition and Construction

8.25 The potential likely significant effects to be assessed will include:

- Temporary effects to the setting and heritage value of surrounding designated and non-designated heritage assets as a result of demolition and construction activities;
- Temporary visual intrusions as a result of demolition and construction activities; and
- Temporary changes to townscape character as a result of demolition and construction activities.

Completed Development

8.26 The assessment will consider the following potential impacts and associated likely effects of the completed Development:

- Effects on the setting and heritage value of surrounding designated and non-designated heritage assets;
- Visibility of the Development in local views and effects on the quality of local views, the effect on the amenity of the viewer and the character of the local townscape; and
- Visibility of the Development and associated change in the townscape and spatial character and quality within the study area.

Non-Significant Effects

Demolition and Construction

8.27 Construction effects are temporary in nature and owing to variation in construction timelines, the cumulative effect would vary over time, cumulative construction effects will be scoped out assessment and will therefore not be assessed.

Assessment Methodology

Completed Development

8.28 The Townscape, Heritage and Visual Impact Assessment (THVIA) will form Volume II of the ES as presented in Table 4.1. Structured, informed and reasoned professional judgement will be used to take account of quantitative and qualitative factors. This is widely accepted as best practice and is based on analysis of desk-based research and field assessment.

8.29 The methodology for assessment of heritage effects will be prepared using the principles set out in the NPPF. The methodology for assessment of townscape and visual effects will be prepared using the principles set out in GLIVIA3. The methodology also has regard to the methodology set out in An Approach to Landscape Character Assessment (2014)[27] prepared by Natural England. Reference will also be made to national, regional and local guidance and policies.

8.30 The three components of the THVIA are:

- Assessment of heritage effects – assessing effects on the setting of designated and non-designated heritage receptors;
- Assessment of townscape effects – assessing effects on the townscape as a resource in its own right; and
- Assessment of visual effects – assessing effects on specific views and on the general visual amenity experienced by people.

8.31 The overarching assessment framework follows a four-step process as outlined below. The assessment framework is applicable to assessments for both the construction and operational phase. A full methodology will be provided within the THVIA.

- Baseline assessment of value;
- Assessment of sensitivity;
- Assessment of magnitude of impact; and
- Assessment of likely effects.

8.32 The assessment will be supported by a set of verified views, where appropriate seasonal variation will be taken into account in the assessment text. A draft viewpoint schedule is provided in Table 8.1. Appendix B illustrates the location of the proposed views for assessment. The viewpoints are subject to change and agreement with LB Brent.

8.33 The objective of a photomontage is to simulate the likely visual changes that would result from a Development, and to produce printed images of a size and resolution sufficient to match the perspective in the same view in the field.

8.34 The following conditions will be prepared for each viewpoint:

- Existing – baseline condition, i.e. the view as it currently occurs;
- Proposed – baseline + the Development, i.e. the Development inserted into the view as either a wireline (AVR type 1) or render (AVR type 3); and
- Cumulative – the Development + other consented or emerging schemes.

8.35 The text accompanying each view presented in the THVIA seeks to contextualise it. Inevitably one must accept that judgement is involved in this specialist area on the basis of the above and the importance of design quality in the operation of policy. In preparing any written assessment, allowances are made for these factors as well as the assessor's knowledge of the Development.

Cumulative Assessment

8.36 The cumulative assessment will have regard to the following consented and emerging development set out in Section 9.

9 Cumulative Effects

9.1 The EIA Regulations specify the information to be included in an ES (Schedule 4) and require that in assessing the effects of a particular development, consideration should be given to cumulative effects. Potential cumulative effects can be categorised into two types:

- Combined effects - occur when two or more different environmental effects from the Development (e.g. dust, noise, traffic) act together to produce a different level of effect/ impact experienced by a particular receptor. These combined effects (or 'Intra-Project') can be additive or synergistic such that the sum of the impacts can be less or more than the individual impacts (i.e. because they may exacerbate or neutralise one another).
- Cumulative effects - are those that accrue over time and space from a number of different development activities and projects in geographical proximity to one another, which individually might be insignificant, but when considered together, could create a significant cumulative effect (also referred to as 'Inter-project' effects).

9.2 The cumulative assessment is important to ensure that the combined impacts of other schemes are understood and appropriately considered in decision making. The cumulative effects of the Development itself, and with other planned or committed development in the local area, will be considered on a topic-by-topic basis and reported in a subsection of each technical ES Chapter, and mitigation measures proposed where necessary. Combined effects will be considered in a separate chapter titled 'Effect Interactions'. The approach for both the Effect Interaction assessment and the Cumulative Effects Assessment with other development is outlined below.

Effect Interactions

Baseline

9.3 The Effect Interactions assessment focusses on individual receptors that have the potential to be affected by multiple impacts addressed under more than one specialist topic in the EIA as a result of the Development. Therefore, the baseline for the Effect Interactions assessment will be determined by the results of the individual topic assessments.

Methodology

9.4 There is no consistent guidance or standardised approach to the assessment of Effect Interactions. However, it is recognised that the Development has the potential to give rise to a variety of impacts upon a number of different receptors some of which may combine to become significant effects.

9.5 Table 9.1 summarises the proposed receptor-based assessment process to be used for both construction and operation of the Development.

Table 9.1: Effect Interaction Assessment Process

Step	Description
Step 1: Identify and categorise receptors	Identify all topic sensitive receptors and their geographical locations based on the study areas and Zones of Influence (ZoI) of the respective technical assessments. These will then be categorised by type.
Step 2: Identify impacts	Identify all topic impacts associated with sensitive receptor(s)/ receptor types.
Step 3: Screen receptors and associated impacts	A screening exercise will be undertaken upon the identified receptors and impacts. Items are screened out from further assessment if they are: ▪ Receptors where no topic impacts overlap; ▪ Receptors with no temporal overlap with topic impacts; or ▪ Receptors where topic impacts are identified as 'negligible'
Step 4: Assess effect interactions	Qualitative assessment based on professional judgement of the effect interactions.

9.6 A screening exercise will be undertaken upon the identified receptors and impacts.

9.7 Based on the topics and methodologies outlined in the previous chapters that are proposed to be scoped into the EIA, it is considered that the sole receptor group where there is potential for effect interactions to occur are ground level human receptors (i.e. pedestrians, visitors, residents) within the Development and adjacent development sites. On this basis, the assessment of Effect Interactions will be limited to this receptor group, in considerations of potential effects on-Site and neighbouring developments.

Cumulative Effects Assessment

Baseline

9.8 The existing environment conditions to be considered in the cumulative assessment will be identified in each technical ES chapter.

Methodology

9.9 The cumulative assessment is important to ensure that the combined effects of other schemes with the Development are understood appropriately for decision making. The cumulative effects of the Development and cumulative schemes in the local area will be considered on a topic-by-topic basis with the cumulative assessment methodologies and the cumulative effects reported in a subsection of each ES chapter, along with mitigation measures where necessary.

9.10 A set of screening criteria has been developed to identify which cumulative schemes in the area should be subject to assessment, as follows:

- Expected to be built-out at the same time as the Development and with a defined planning and construction programme;

- Spatially linked to the development (within 1km of the Site boundary);
- Considered an EIA development and for which an ES has been submitted with the planning application;
- Those which have received planning consent from the planning authority (granted or resolution to grant) and / or,
- Introduces sensitive receptors near to the Site (but are not EIA development).

9.11 A planning search was undertaken considering the above criteria and the cumulative schemes identified are illustrated in Figure 9.1 and outlined within Table 9.2.

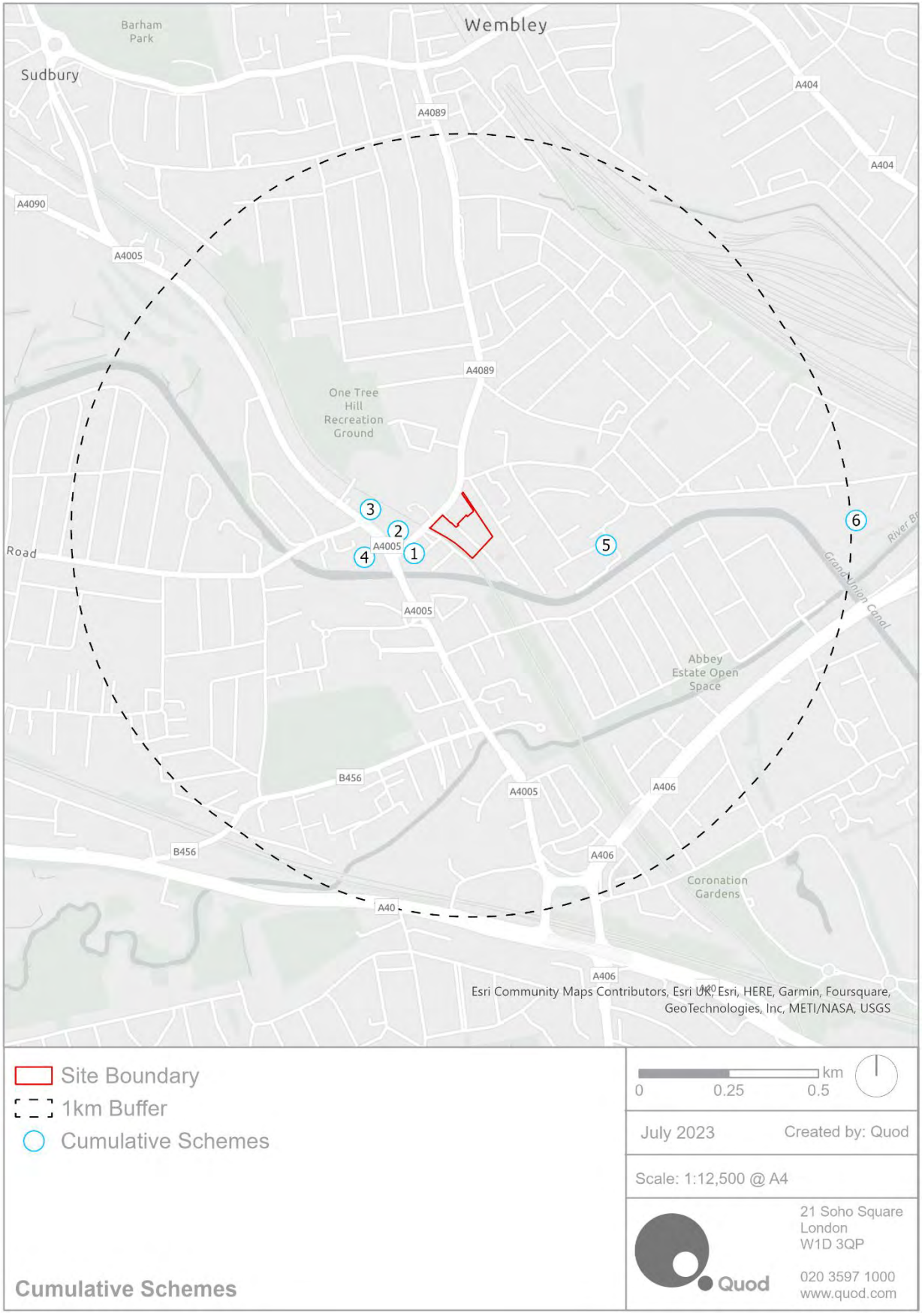
Table 9.1: Surrounding Cumulative Schemes

No.	Project, LPA Reference, Description and Status	Distance / Direction from Site
1	**Minavil House, Rosemont Road, Wembley, HA0 4PZ (Ref. 16/2629)** Demolition of existing two storey commercial buildings and erection of a mixed used development ranging from ten to twenty six storeys in height, comprising 251 residential flats (83 x 1bed, 136 x 2bed and 32 x 3bed), 1,942 sqm retail foodstore (Use class A1) on the ground floor, 622sqm of office space (Use Class B1) on the first floor, 634sqm retail floorspace for flexible use as cafe, bar or restaurant (Use class A1, A4 or A3) at lower ground floor and ground floor level; together with associated vehicular access, car and cycle parking spaces, bin stores, plant room, landscaping and private and communal amenity space, *Consented 21st January 2019. Discharge of pre-commencement conditions ongoing.*	80m west
2	**330 Ealing Road, Wembley, HA0 4LL (Alperton Bus Garage) (Ref. 20/3914)** Demolition of the existing buildings and structures, the erection of a building ranging in height up to 28 storeys, incorporating residential units and industrial, community and commercial uses, together with associated landscaping, access arrangements, car and cycle parking, servicing and refuse and recycling. *Consented 29th October 2021. Discharge of pre-commencement conditions ongoing*	90m west

No.	Project, LPA Reference, Description and Status	Distance / Direction from Site
3	**Part of Westend Saab, 2A Bridgewater Road and Boyriven Textile, Bridgewater Road, Wembley, HA0 1AJ (Ref. 21/3941)** Demolition of the existing buildings and structures, the erection of a 'co-location' scheme ranging in height from 2 to 19 storeys, incorporating industrial floorspace with residential accommodation (Use Class C3), together with associated landscaping, access arrangements, car and cycle parking, servicing and refuse and recycling facilities *Pending Decision*	175m north west
4	**Alperton House, Bridgewater Road, Wembley HA0 1EH (Ref. 18/4199)** Demolition of the existing buildings and construction of 4 buildings ranging in height from 14 to 23 storeys, comprising 474 residential units at 1st to 23rd floors (140 x 1-bed, 263 x 2-bed and 71 x 3-bed), mixed commercial use at ground and part 1st floor including a new public house (Use Class A4) retail floorspace (Use Classes A1, A2, and/or A3), workspace (B1b/c), and an office (B1a), together with associated public realm improvements; soft/hard landscaping; creation of a canal side walkway, new access arrangements, car and cycle parking; servicing, refuse and recycling facilities. *Consented 17th June 2019.*	200m west
5	**Alperton Manufacturing Estate, Mount Pleasant, Wembley, HA0 (Ref. 20/3156)** Demolition of the existing buildings and the erection of a mixed use development of buildings ranging between 3 and 16 storeys in height, comprising residential units, flexible commercial floorspace, affordable workspaces and community use floorspace, associated car parking, landscaping and ancillary facilities (phased development), subject to a Deed of Agreement dated 11 January 2022 under Section 106 of the Town and Country Planning Act 1990 *Consented 21st January 2022*	350m east
6	**Former Northfield Industrial Estate & units 2-18 Beresford Avenue & Abbey Works Estate, Wycombe Road, Wembley, HA0 & Ace Corner & Capital House, North Circular Road, London, NW10 (Grand Union) (Ref. 18/0321)** Hybrid planning application for the redevelopment of Northfield industrial estate: Outline planning permission for the demolition of existing buildings and structures on the site, all site preparation works and redevelopment to provide new buildings ranging from 35.75m AOD to 111.95m AOD in height, with a total floorspace (GEA) of up to 309,400 sq m (excluding basement up to 42,000 sq m GEA) to accommodate 2,900 homes (Use Class C3), business and storage and distribution (Use Classes B1a, B1c and B8), commercial (Use	1 km east

No.	Project, LPA Reference, Description and Status	Distance / Direction from Site
	Classes A1, A2, A3, A4 and A5), community and leisure (Use Classes D1 and D2) including community centre and nursery, new basement level including energy centre, associated storage, cycle and vehicle parking, new vehicular accesses, associated highway works to Beresford Avenue, landscaping and creation of new public and private open space, ancillary facilitating works, various temporary meanwhile uses, interim works and infrastructure. Full planning permission for demolition of existing buildings and structures on the site, all site preparation works and the development of Phase 1 (Buildings A, B, C and D ranging from 1 to 14 storeys in height) to comprise 400 homes (Use Class C3); 910 sq m (GEA) of business floorspace Use Class B1a); 1,290 sq m (GEA) of commercial floorspace (Use Classes A1, A2, A3, A4 and A5); and 1,610 sq m (GEA) of community and leisure floorspace (Use Classes D1 and D2), including a community centre and nursery; together with new basement level including energy centre, associated storage, cycle and vehicle parking, new vehicular accesses, associated highway works to Beresford Avenue, landscaping and creation of new public and private open space, ancillary facilitating works, various temporary meanwhile uses, interim works and infrastructure. *Consented 28th September 2018.*	

Figure 9.1: Cumulative Scheme Plan



10 Non-Significant Topics

Introduction

10.1 As stated within the EIA Regulations, an ES is required to identify only the 'likely significant environmental effects' of a development. The rationale for this scoping exercise has been guided by the current PPG, which highlights the expectation that the ES should focus on the 'main' or 'significant' environmental effects only. The PPG states:

"Whilst every Environmental Statement should provide a full factual description of the development, the emphasis should be on the "main" or "significant" environmental effects to which a development is likely to give rise. The Environmental Statement should be proportionate and not be any longer than is necessary to assess properly those effects. Where, for example, only one environmental factor is likely to be significantly affected, the assessment should focus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered."

10.2 The following topics are considered to be those where 'significant' effects are unlikely to arise from the Development. As such, these issues would not be assessed in detail through the EIA process. Non-significant issues have also been identified within previous topics sections where relevant.

- Transport and Access;
- Air Quality;
- Noise and Vibration;
- Biodiversity;
- Ground Conditions and Contamination;
- Water Resources and Flood Risk;
- Climate Change and Greenhouse Gases;
- Human Health;
- Waste and Materials;
- Vulnerability to Major Accidents or Disasters;
- Energy and Sustainability;
- Utilities;
- Telecommunications; and
- Electromagnetic Fields.

10.3 Rationale for scoping these topics out of the ES is provided in Table 10.1, with reference to the schedule of mitigation measures set out in Appendix A.

Table 10.1: Rationale of Scoping Out Technical Topics from ES

Potential Effect	Rationale for Scoping Out
Transport and Access	▪ The Site is located on the southeast side of Ealing Road, with the Atlip Centre fronting Ealing Road immediately opposite Alperton Underground Station and Alperton Community School. The Site is bound to the south west by the railway line (and arches), to the southeast by the Alperton Village mixed use development, and to the northeast by the rear gardens of terraced housing on Sunleigh Road. ▪ Public transport access to the site is good (PTAL 4), with Alperton station (Piccadilly line) and seven bus services within 640m metres (8 minutes' walk). The PTAL rating is predicted to increase to 5 by 2031 due to planned enhancements to the capacity of the Piccadilly Line. ▪ Construction traffic effects are not expected to be significant. Construction traffic routes, movements and associated effects such as driver disruption, dust and dirt nuisances would be dealt with through standard and widely used management measures and managed through adherence to a CEMP. The net change in Heavy Goods Vehicles ('HGVs') and light vehicular traffic flows on the local road network during construction of the Development is not expected to be significant in the context of existing traffic flows on the surrounding highways. ▪ The Development is not considered to result in significant transport effects once it is complete and operational. London Plan Policy T6 expects new residential developments to be car-free when in highly sustainable locations that are well-connected by public transport. The Development will be a 'car-free' development, with the exception of blue-badge disabled parking spaces in line with London Plan Policy T6 standards. ▪ The main modes of travel for future occupants of the Development will be by public transport or active travel modes, such as cycling or walking. A Travel Plan will be prepared to promote these sustainable transport modes and reduce the use of private cars by the future occupants. The pavements and existing public transport network are considered to have sufficient capacity to accommodate the increase in use associated with the Development and no significant effects on these networks are considered to be likely. ▪ A Healthy Streets Transport Assessment, including a Parking and Access Statement and a Delivery and Servicing Plan, and Travel Plan will be submitted with the planning application.
Air Quality	▪ The Site is located in an Air Quality Management Area (AQMA), designated for the entirety of the London Borough of Brent for exceedances of the annual mean nitrogen dioxide (NO_2) and the daily mean Particulate Matter (PM_{10}) concentrations.

Potential Effect	Rationale for Scoping Out
	▪ The closest sensitive receptors which may potentially be affected by the Development include residential receptors along Sunleigh Road. Future residential receptors introduced through emerging development within the surrounding area have been considered. ▪ The greatest potential air quality effects relate to dust nuisance during construction of the Development. With the implementation of good practice measures set out in the CEMP to minimise and control dust at source during construction, effects are unlikely to be significant. Method statements will be provided and will include measures such as hoarding, water suppression and covering of transport vehicles. Method statements will be based on industry standard guidance published by the Institute of Air Quality Management. Construction plant and equipment used for construction works will be modern and compliant with current EU emissions standards and as such, exhaust emissions during construction works are not expected to give rise to significant adverse effects. These measures will be set out in the CEMP. Overall, no significant effects during the construction phase are expected. ▪ Road traffic generated by the Development would result in emissions of NOx and particulates and may impact local air quality. Given that the completed Development is a car-free development with the exception of blue badge spaces and will result in the removal of the existing car parking on-site, it is considered that there would be a reduction in road traffic emissions and therefore beneficial effects would be expected, although these would not be considered to be significant. The completed Development would meet LB Brent requirements to ensure that building plant emissions would be minimal. Consequently, no significant air quality effects are predicted for the Development. ▪ The Development will be for a mix of residential and flexible town centre/community uses. The energy strategy is still being developed but will be focussed on minimising emissions as far as possible, with no provision of gas supplies within residential units or retail, although there may be limited provision in kitchens for food and beverage uses. It is anticipated that an Air Source Heat Pump energy strategy will supply the development. The proposed strategy provides a great number of benefits to the Development, first and foremost anticipated operational carbon reductions in excess of 40-45% (compared to the Part L 2021 baseline). The nature of the Development is such that it would not be likely to release a significant level of pollutants or any hazardous, toxic or noxious substances into the air. Emissions from plant would be dealt with by standard measures and conditions. ▪ Notwithstanding, an Air Quality Assessment will be submitted with the planning application to provide an assessment of potential air quality impacts of the Development. This will incorporate an Air Quality Neutral assessment.
Noise and Vibration	▪ The Site is in a mixed-use urban area of residential, commercial and retail uses. The ambient noise and vibration environment is primarily influenced by rail and road traffic sources, particularly the adjacent underground line and the

Potential Effect	Rationale for Scoping Out
	railway infrastructure to the west heading towards Alperton Underground Station. The closest residential receptors are situated immediately to the east along Sunleigh Road. Future sensitive receptors include residential receptors at the surrounding cumulative schemes. ▪ There are likely to be temporary short-term increases in noise during the demolition and construction works, including noise resulting from construction plant and vehicles. Noise sources will be controlled by industry standard good practice measures including acoustic screening / site hoardings, the selection of appropriate construction techniques and the restricted operation of certain plant and activities to agreed hours. These measures will be controlled via the CEMP. HGVs accessing / egressing the Site have the potential to cause highly localised vibration effects; however, these effects are not expected to be significant at the sensitive receptors. ▪ Where a receptor is affected by continuous traffic flow, a doubling in traffic flows is required to generate a 'just perceptible' change of 3dB. The volumes of road traffic to be generated by construction and the completed Development would not lead to a perceptible increase in overall traffic noise due to the nature of the car-free development and the overall reduction in car parking spaces. Traffic relating to the Development will be minimised through good practice measures, including the Travel Plan. It is therefore considered unlikely that traffic associated with the Development would give rise to any significant effects on nearby noise- or vibration-sensitive receptors. ▪ The Development will be subject to appropriate acoustic design and glazing and ventilation principles to protect future residents' amenity. These measures will be detailed in a Noise Assessment which will consider the impact of existing noise levels on future occupiers of the Development. The Development will be designed to meet internal noise level requirements of BS 8233:2014, as well as LB Brent requirements. ▪ Notwithstanding, a Noise and Vibration Assessment will be submitted with the planning application to provide an assessment of the potential impacts of the Development.
Biodiversity	▪ The Site is not covered by any statutory or non-statutory site wildlife designations. The closest statutory designated site is the Fox Wood Local Nature Reserve (LNR) approximately 1.4km south of the Site, with the Perivale Wood LNR located approximately 1.9km west of the site. The Grand Union Canal (50m south of the Site boundary) and One Tree Hill recreation ground (230m north of Site boundary) are both designated as Sites of Metropolitan Importance to Nature Conservation (SINC) under the LB Brent Local Plan Core Strategy. Adjacent to the western boundary of the Site there is a designated wildlife corridor under the London Plan G6, which runs along the railway towards the Grand Union Canal.

Potential Effect	Rationale for Scoping Out
	▪ An extended Phase 1 Habitat Survey has been undertaken on the Site, with the findings reported within a Preliminary Ecological Appraisal (PEA). The habitats on-site predominantly comprise buildings and hardstanding with some scattered trees. The scattered trees are located in between parking bays within the car park in the south of the Site. The habitats are of limited ecological value. The trees do not have any features potentially suitable for use by roosting bats. The Atlip Centre is assessed as having low potential to host roosting bats, with 2 Atlip Road and the electrical substation in the south of the Site assessed as having negligible potential to host roosting bats. As the Atlip Centre has low potential to support roosting bats, one dusk emergence and one pre-dawn re-entry survey will be undertaken between May and the end of August. ▪ Although some limited tree loss may be required to enable construction of the Development, the CEMP will include measures for habitat protection and enhancement necessary during the construction phase. Demolition would be undertaken outside of the bird nesting season (March – August inclusive). ▪ Once complete, the Development would bring forward new green space, which is likely to include native planting and integrated bat and bird boxes will be incorporated into the Development. A biodiversity net gain assessment will be submitted with the application. Overall, no significant effects are predicted from the Development.
Ground Conditions and Contamination	▪ Historical mapping indicates the Site was a field in 1874 and by the late 19th Century had been worked as part of Mission Room Brick Field. By 1914, a rubber works had been constructed on the site, with the brick field workings presumably infilled. In 1920 the works were taken over by a furniture manufacturer and the buildings expanded. The works were demolished in the 1980s and the existing buildings constructed in the late 20th Century. ▪ British Geological Survey (BGS) maps show the Site is within an area of worked ground, underlain by the solid geology of the London Clay, designated as an ‘Unproductive’ stratum, by the Environment Agency (EA). Superficial deposits of the Taplow Gravel and Alluvium were shown adjacent the River Brent to the south. ▪ A Ground Investigation (GI) report has been prepared for the Site following intrusive investigations in 2019. The GI comprised to four cable percussion boreholes and one hand excavated soakaway trial pit. Assessment of the potential linkage between ground contamination sources, human and environmental receptors were assessed based on the intrusive ground investigation documented. The chemical testing of samples of made ground has identified elevated concentrations of lead and benzo[a]pyrene in respect to the proposed residential without home grown produce/commercial end use. Asbestos fibres were also locally identified within the made ground soils. There is a moderate risk that the made ground soils would affect groundworkers and future end users of the site where the made ground is exposed, such as in gardens or landscaped areas. The underlying naturally deposited soils encountered at

Potential Effect	Rationale for Scoping Out
	depth beneath the Site would be considered suitable for re-use within the development. Remediation will be required within any landscaped areas of the development, where remnant made ground soils will be exposed at the surface. This will involve the removal of made ground and replacement with a suitably thick cover or barrier layer in order to break the pathway between the underlying made ground and end users of the residential development. The Development layout will be refined and will clearly identify areas of new soft landscaping and communal gardens, together with areas where existing made ground is to remain. The GI report concludes that the mixed-use development on-site would be unlikely to result in ground contamination. ▪ An updated walkover survey will be undertaken, and a Phase 1 Land Contamination Assessment will be submitted to accompany the planning application. Subject to the results of the Phase 1 Land Contamination Assessment and updated GI , remediation, validation and construction of the Development will be undertaken in line with standard practice and legislative requirements. This will ensure appropriate management of any contamination if present and minimise pollution risks to controlled waters and to human health of construction workers. These measures will be secured through the remediation strategy and CEMP. As such, significant environmental effects are not considered likely to occur during construction. ▪ On completion of the Development, much of the Site will be covered with new buildings, hardstanding and landscaping; as such, the risk to receptors (namely human health) will be low. There would be no likely significant effects related to ground conditions or contamination from the completed Development.
Archaeology	▪ There are no World Heritage Sites, Scheduled Monuments or registered battlefields within 1km of the Site. The closest Scheduled Monument is the "Medieval Moated Site, 454m south-west of Sudbury Golf Club House"[3]. LB Brent is undergoing a review of their Archaeological Protected Areas (APA) in line with new Greater London Archaeological Advice Service APA Guidance, but previously the Site was not located within an APA. ▪ A desk-based archaeological assessment has been prepared and is provided in Appendix D which considers the archaeological potential of the Site and the potential for any impacts as a result of the Development. The Site is considered to have a generally low theoretical archaeological potential for all past periods of human activity. Past, post-depositional impacts are considered likely to have been widespread and severe as a result of historic quarrying and subsequent industrial and commercial development, such that any archaeological remains once present have been removed. No further archaeological mitigation measures are recommended.

[3] https://historicengland.org.uk/listing/the-list/list-entry/1001971?section=official-list-entry

Potential Effect	Rationale for Scoping Out
	▪ Overall, no likely significant effects with respect to archaeology are expected.
Water Resources and Flood Risk	▪ The River Grand Union Canal is located 50m to the south of the Site. The Site is located entirely within Flood Zone 1 for risk of flooding from rivers and sea. The Site is predominantly at a very low risk of surface water flooding, although there are some localised areas subject to a low to high risk of surface water flooding in the central part of the Site. The Site is not located within an area at risk of reservoir flooding. ▪ Potential risks to water resources during construction will be controlled through standard measures agreed with LB Brent. These will form part of the CEMP and may include measures such as bunding of storage areas, petrol interceptors and good site management. Potential pollution sources within the completed Development (e.g. oils from vehicles in surface water runoff) will be dealt with through standard design measures and the incorporation of a Surface Water Drainage Strategy. As such, the Development is not likely to result in any significant water quality effects. ▪ The planning application submission will set out the proposed SuDS measures to restrict surface water discharge to ensure the Development does not give rise to significant flood risk elsewhere. Due to the emerging nature of the proposals, details on the drainage strategy are not yet known. A Flood Risk Assessment (FRA) will be prepared in line with NPPF and LB Brent requirements and will accompany the planning application. A Surface Water Drainage Strategy will be developed based on the results of the FRA (which will include a climate change allowance) and will also accompany the planning application. In line with policy, the FRA and Surface Water Drainage Strategy will ensure that the proposals do not result in increased flood risk off-site and sufficient measures are incorporated into the design to achieve the required runoff rates. ▪ The completed Development will lead to an increased demand for potable water and foul water discharge as a consequence of the new residential and commercial uses, however it is not considered the effects would be significant. The Development would minimise the use of potable water in line with Operational Requirements of Building Regulations. ▪ As a result, no significant effects on water resources, flood risk and drainage are anticipated.
Climate Change (Greenhouse Gas Emissions)	▪ The Development will not give rise to significant emissions of greenhouse gases associated with an uplift in road traffic or with the operations of the Site or the operations of the Development. The Development will result in a reduction of car parking spaces due to the removal of the existing car parks and the ‘car-free’ nature of Development. The operations of the Site are predominantly residential development. The Development will incorporate appropriate climate change adaption measures designed to address the potential risks associated with climate change, including

Potential Effect	Rationale for Scoping Out
	allowance for storm events in drainage design, use of durable materials, solar shading and glazing to avoid overheating. ▪ The Development will comply with Building Regulations 2021 Part L and Part O, and will align with the current London Plan and Brent Local Plan 2019-2041 policies on zero carbon by following the steps of the energy hierarchy: Be Lean – Be Clean - Be Green - Be Seen. ▪ The Development will implement a fabric first approach and energy efficiency measures to achieve 10% (residential) and 15% (non-residential) carbon savings over Part L2021 as far as possible. Early-stage tests indicate expected carbon savings at this stage of the energy hierarchy for the domestic part of the development exceed the minimum 10% requirement. ▪ It is not currently proposed to connect the site to a DHN as the London Heat Map shows no existing or potential DHNs. It is however proposed to incorporate a centralised heating network with either central air source heat pumps (ASHPs) in one energy centre for the Development or ASHPs within each Block with a network feeding each building. This would allow for a point of connection in case a DHN becomes available in the area for a point of connection. This ensures no combustion undertaken on-site. ▪ Initial calculations indicate the proposed energy strategy will result in approximately 40-45% carbon savings when compared to a Part L baseline for the residential units. This is prior to the application of any proposed photovoltaics (PVs). PV arrays will also be maximised across all available, accessible and unshaded roof space as far as feasible, resulting in further CO2 reductions. The savings from this array have yet to be quantified, but this would be in addition to the carbon emission reduction expected to be achieved from the proposed strategy described above. ▪ The Applicant will minimise carbon emissions from any other parts of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions. The whole life-cycle carbon emissions will be calculated through a Whole Life-Cycle Carbon Assessment and will demonstrate actions to reduce carbon emissions. ▪ Overall, no significant increases in greenhouse gas emissions are anticipated as a result of the Development. An Energy Statement, Sustainability Assessment and Circular Economy Statement will be prepared to accompany the planning application.
Human Health	▪ Poor health outcomes could arise from construction effects such as dust or pollution from construction traffic. However, the Applicant will prepare proposals on construction and environmental management to manage the construction of the Development addressing issues related to health and wellbeing, including public safety, noise and vibration controls,

Potential Effect	Rationale for Scoping Out
	and air and dust management. A number of these measures will be included in management plans, such as the CEMP. ▪ The Development will provide new housing and employment opportunities. At the system level, greater access to adequate housing and employment may be positively correlated with good health, but these effects will be uncertain and are not measurable at the level of an individual site. The incidence of any such health effects will be widely dispersed through marginal changes to the wider housing and employment markets, and so the effect is not significant at any level. ▪ Despite the indirect links that have been identified between new development and health and wellbeing, the potential effects of a new development on the health and wellbeing of new and existing residents and workers would be largely determined by the way the development's buildings and spaces are used (rather than constructed) and by lifestyle factors which cannot be accurately quantified or controlled at the planning stage. ▪ The Development is being designed with careful consideration of future health and wellbeing factors and could provide indirect health benefits through employment opportunities, noise mitigation, new public and private amenity space, opportunities for active travel and improved access to nature and play space. The ES Chapter on Socio-Economics will also include an assessment of the effects of the Development on various aspects that could have an indirect relationship with health, including housing, employment creation, access to health and education facilities and access to open space and play space. These areas are those which can have the most significant direct socio-economic effects on health arising from a development. Furthermore, other planning application documents such as the Transport Assessment, FRA and air quality assessment would consider the Development's indirect or secondary impacts which could have an effect on health and well-being.
Waste and Materials	▪ Waste streams arising from the construction stage of the Development would mainly comprise soil from excavation and foundation work, however it would be the intention to reuse as much material on-site as practicable in accordance with the waste hierarchy. Waste produced during construction would be subject to the 'Duty of Care' under the Environmental Protection Act and managed by the contractor in line with current legislation, guidance[4] and best practices, with construction waste materials disposed of by the contractor/s to appropriate recycling facilities or appropriately licensed landfills. The CEMP will set out roles and responsibilities such that the Site Manager will audit

[4] Including the Environment Agency's Guidance for Pollution Prevention and other relevant guidance to be followed during the handling, storage and use of such materials, including oil, chemicals, cement, cleaning materials and paint.

Potential Effect	Rationale for Scoping Out
	waste carriers and disposal facilities and maintain documentary evidence that these requirements are being met, including a register of waste carriers, disposal sites (including transfer stations) and relevant licensing details and testing for each waste stream. ▪ Operational waste from the completed Development would predominately comprise residential waste arisings. This would predominantly be collected under waste disposal contracts with commercial operators. The Development will be designed to comply with LB Brent's recycling and waste requirements and ensure the provision of sufficient waste storage areas across the Development to enable occupants to segregate their waste and recyclables, building managers to manage capacity and appropriate access for refuse collection vehicles. ▪ Given the nature and scale of the Development, volumes of waste generated during construction and operation are not expected to give rise to a significant impact on waste management infrastructure. Potential significant effects would be avoided or minimised as result of proposed scheme mitigation (see ID no. 1 in Appendix A). This would ensure that the Development does not lead to significant effects on materials and waste during construction and operation. The ES will outline likely waste quantities arising from construction works and operations and present the Applicant's commitments to waste minimisation and management.
Vulnerability to Major Accidents and Disasters	▪ There are no Control of Major Accident Hazards (COMAH) sites within a 1km radius of the Site. ▪ Available guidance (IEMA Quality Mark Article 'Assessing Risks of Major Accidents / Disasters in EIA') defines major accidents and disasters as *"man-made and natural events which are considered to be likely, and are anticipated to result in substantial harm that the normal functioning of the project is unable to cope with /rectify"*. ▪ Overall, the vulnerability of the Development to risks of major accidents and /or disasters is considered to be low. Risks to fire can be assumed to be low provided the detailed design and fire strategy are developed in line with the latest fire safety guidance. The proposed use is not considered hazardous and the most likely foreseeable vulnerabilities of the Development are related to flood risk and road traffic accidents. These risks will be considered as part of the FRA and a Transport Assessment respectively.
Energy and Sustainability	▪ The planning application will likely be supported by an Energy and Sustainability Strategy. This negates the need for further energy and sustainability assessments within the ES. ▪ The main sustainability features of the Development (e.g. SuDS strategy, energy strategy) will be summarised in the description of the Development included in the ES. As such, all technical assessments will inherently test the principal sustainability design features sought as part of the planning application.

Potential Effect	Rationale for Scoping Out
Utilities	▪ The Development will have a relatively small demand on the grid network in relation to power and water utilities. Consultation with the relevant statutory bodies will be undertaken to ensure the existing electricity, gas and clean water networks, as well as local foul drainage, will have sufficient capacity to supply the Development.
Electromagnetic Interference	▪ All new electrical plant will be designed in accordance with the current British Standards (e.g. BS EN 62041:2010) which set the specific limits for electro-magnetic fields. ▪ No major sources of electro-magnetic fields (such as high voltage transformers or electricity transmission line/cables) are proposed as part of the Development.

Appendix A - Schedule of Proposed Scheme Mitigation

ID No.	Mitigation Measure(s)	Anticipated Securing Mechanism
1	Submission and implementation of a CEMP that shall include the following as a minimum: ▪ The construction programme and phasing; ▪ Hours of operation and delivery of materials; ▪ Details of any highway works necessary to enable construction to take place, including access; ▪ Parking and loading arrangements; ▪ Emergency planning response including fire prevention and control and worker welfare; ▪ Details of site compound: location relative to the site, lighting, hoarding, security, parking, material storage areas, and utilities, including measures taken to utilise renewable energy sources and to reduce energy consumption; ▪ Details of an Air Quality Dust Management Plan; ▪ Details of a Site Waste Management Plan, including reuse of soils[v] and site materials where practicable; ▪ Details of consultation and complaint management with local businesses and neighbours including contact details; ▪ Construction site lighting controls to appropriately mitigate light pollution onto nearby sensitive receptors. ▪ Mechanisms to deal with environmental and heritage impacts such as noise and vibration, air quality and dust, light and odour, including pollution incident response processes; and ▪ Details of surface water and water quality management controls and procedures (e.g. fuel spillages) during construction activities.	Planning condition
2	Submission and implementation of a CTMP that shall include the following as a minimum: ▪ Construction vehicle numbers, type, routing; ▪ Access arrangements to the site; ▪ Traffic management requirements; ▪ Delivery and unloading arrangements; ▪ A Construction Travel Management Plan (CTMP) to include site operatives and other on-site personnel	Planning condition

[v] Through adherence to the Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, September 2009)

ID No.	Mitigation Measure(s)	Anticipated Securing Mechanism
	▪ Timing of construction activities (including delivery times and removal of waste) and to avoid school pick up/drop off times; ▪ Provision of sufficient on-site/ compound parking prior to commencement of construction activities; ▪ Where works cannot be contained wholly within the site a plan should be submitted showing the site layout on the highway including extent of hoarding, pedestrian routes and remaining road width for vehicle movements; and ▪ Measures to be taken to seek approval from the highway authority that the highway extent has been marked out accurately prior to construction.	
3	Submission and implementation of a Drainage Strategy comprising the following components: ▪ Provision of landscaping and Sustainable Drainage Systems (SuDS) to reduce potential flood risk and drainage impacts; ▪ Installation of measures to minimise the potential for accidental spills and contamination in relevant areas (e.g. car parks), such as petrol interceptors.	Drawings and design principles for approval
5	Submission of an Energy and Sustainability Strategy which will specifically address the following: ▪ How green infrastructure, urban greening and water management have been integrated; ▪ Reducing energy and carbon embodied in construction materials through re-use and recycling of existing materials where possible, and the use of sustainable materials and local sourcing where possible; ▪ Considering high quality innovative design, new technologies and construction techniques, including zero or low carbon energy/energy generation and water efficient, design and sustainable construction methods; ▪ Demonstration that energy and carbon reduction and sustainability has been considered in all stages of the commissioning, procurement, transportation and construction processes.	Drawings and design principles for approval
6	Sensitively designed building massing, layout and appearance.	Drawings and design principles for approval and an anticipated planning condition on materiality of buildings
7	Landscape strategy outlining planting to provide visual screening, achieve biodiversity net gain (BNG), tree retention and protection principles;	Drawings and design principles for approval

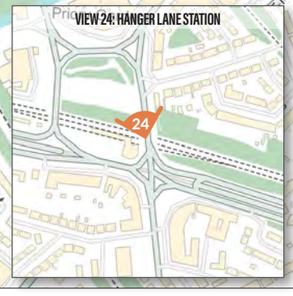
ID No.	Mitigation Measure(s)	Anticipated Securing Mechanism
8	Buildings designed in line with Building Regulations and will be designed to meet internal noise and vibration requirements of BS 8233:2014 and BS 6472-1:2998	Planning condition

Appendix B – Proposed Viewpoint Locations, Heritage Asset Plan and Townscape Character Plan

VIEW LOCATION PLAN

- Application Site

1. Stanley Avenue
2. Kathleen Avenue
3. One Tree Hill Recreation Ground
4. Alperton Cemetery
5. Grand Union Canal
6. Junction of Ealing Road
7. Alperton Sports Ground
8. Abbey Avenue
9. Woodside Close
10. Lyon Park Primary School Playing Fields
11. Mount Pleasant Open Space
12. Twyford Abbey driveway
13. Sudbury Golf Club
14. Mount Pleasant / Ealing Road
15. Alperton Baptist Church
16. Regents Canal southeast
17. Regents Canal southeast 2
18. Regents Canal east
19. Regents Canal southwest
20. Regents Canal, Venice House
21. Alperton Station approach
22. Sunleigh Road
23. Atlip Road
24. Hanger Lane Station
25. Horsenden Hill



0 150 300 450 600 750 m

LOCATION:
Atlip Road, Alperton

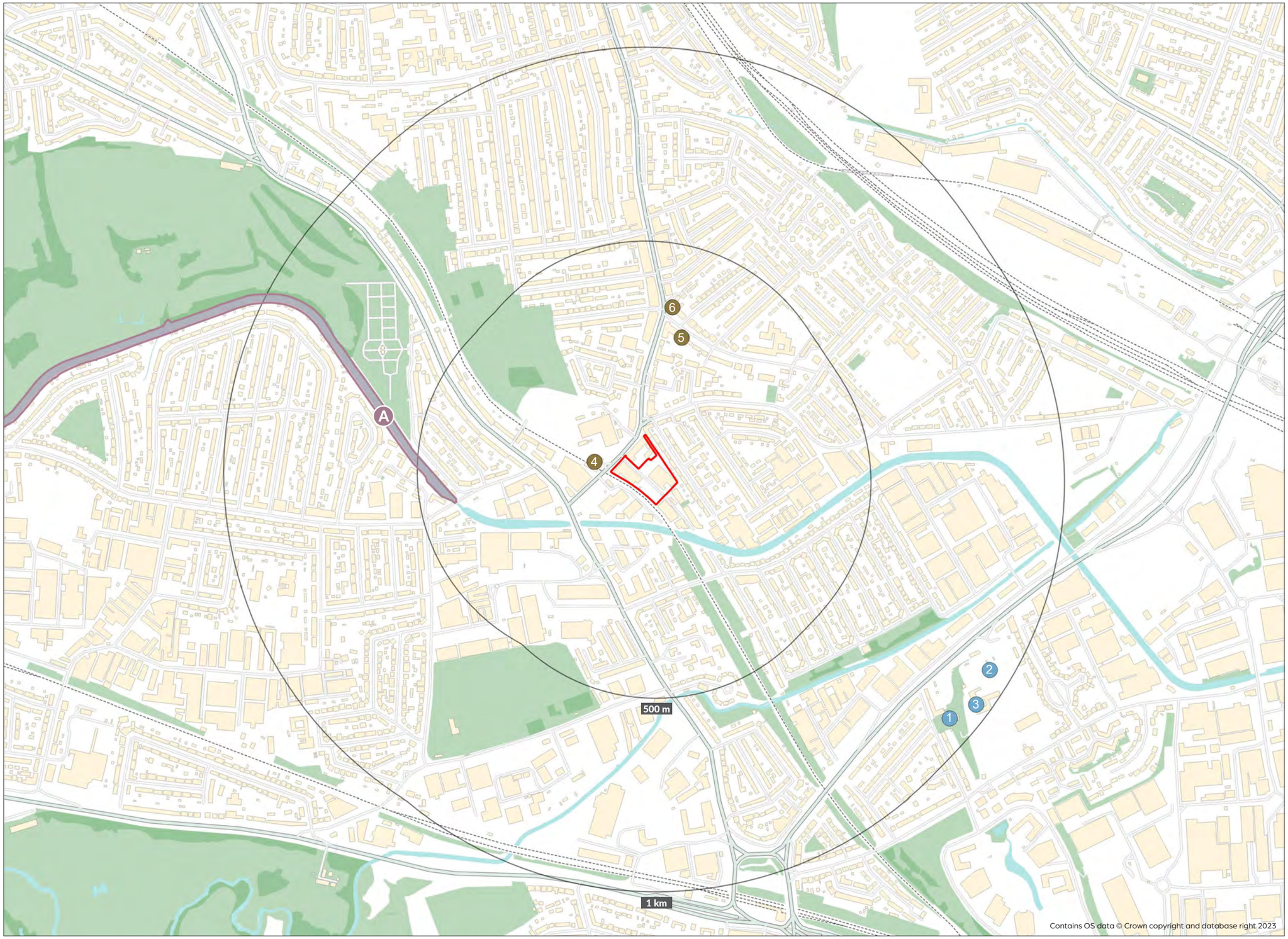
DATE:
May 2023

SCALE:
1:10,000 @ A3

FIGURE:

▲ **NORTH**

MONTAGU EVANS
CHARTERED SURVEYORS
70 ST MARY AXE,
LONDON, EC3A 8BE
T: +44 (0)20 7493 4002
WWW.MONTAGU-EVANS.CO.UK



HERITAGE ASSET PLAN

Application Site

Conservation Areas

A. Canalside, northwest part CA

Listed Buildings

Grade II

1. Church of St Mary
2. Garden Wall to North of Twyford Abbey
3. Twyford Abbey

Locally Listed Buildings

4. Alperton Station
5. 2-4 Stanley Avenue
6. 1-3 Stanley Avenue

LOCATION:
Atlip Road, Alperton

DATE:
May 2023

SCALE:
1:10,000 @ A3

FIGURE:

NORTH

MONTAGU EVANS
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70 ST MARY AXE,
LONDON, EC3A 8BE
T: +44 (0)20 7493 4002
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TOWNSCAPE CHARACTER AREA PLAN

Application Site

1. Alperton Central Industrial / Tall Building Zone
2. East Alperton Inter-war residential
3. South Alperton Residential
4. Alperton Station and Ealing Road Commercial
5. One Tree Hill residential / Sudbury Golf Club
6. Wembley Intercity Depot
7. North Circular Industrial / Retail Estate
8. Hanger Lane Industrial / Retail Estate
9. Perivale Residential

1 km

LOCATION:
Atlip Road, Alperton

DATE:
May 2023

SCALE:
1:10,000 @ A3

FIGURE:

NORTH

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Appendix C – Structure of ES Technical Chapters

Introduction

The introduction will provide a brief summary of what is considered in the chapter and will state the author and/or relevant technical contributor and their competence.

Legislation, Planning Policy and Guidance

This section will summarise the relevant planning policy, legislation and guidance that form the context for the topic in bullet point form to minimise length. A detailed review of relevant planning policy, legislation and guidance will be provided as an Appendix to the chapter or within the supporting technical report within Volume III of the ES.

Assessment Methodology

The assessment methodology section in each chapter will provide an explanation of methods used in undertaking the technical assessment and the prediction of effects. Reference will be made to published standards, professional guidelines and best practice of relevance to the topic.

This section will also describe any topic-specific significance criteria applied in the assessment, particularly where these differ from common or generic criteria applied elsewhere in the ES. However, wherever possible, a common scale and language for assessing effects will be applied.

Consultation undertaken as part of the assessment to agree scope or methodology will be set out in the chapter. Where appropriate, it will describe the assumptions and limitations related to the assessment of the topic and any constraints to undertaking the assessment.

Baseline Conditions

A description of the environmental conditions that exist in the absence of the Development both now and, where relevant, those that are projected to exist in the future will be provided. The results of baseline surveys and desktop research will be summarised in this section.

Relevant receptors to the specific topic-based effects (e.g. noise, air quality) will be described, together with an indication of the relative sensitivity of these receptors to such effects. Comment will also be made on the future baseline conditions as required by the EIA Regulations.

Scheme Design and Management

This section will present the embedded design and / or management measures that will form part of the Development to avoid, prevent, reduce or offset environmental effects. These measures will be clearly defined to ensure transparency and to ensure that the impact assessment does not assess a scenario that is unrealistic in practice.

Demolition and Construction

This section will present the assessment of potential effects/ impacts that are predicted to occur during the construction phase. Mitigation measures, over and above those included in the Outline CEMP will also be presented, together with residual effects.

Completed Development

This section will present the assessment of potential effects that are predicted to occur once the Development is complete and occupied together with the mitigation and residual effects.

Cumulative Effects

This section will present the assessment of potential cumulative effects with other projects in the vicinity that are predicted to occur during both the construction and completed Development phases together with the mitigation and residual effects.

Summary

This section will include a tabulated summary of the potential effects, mitigation measures and residual effects. The potential mechanisms by which the proposed mitigation measures will be implemented (e.g. CEMP, specific planning conditions or Section 106 obligations) will be specified, where appropriate.

Appendix D – Archaeological Desk Based Assessment

ARCHAEOLOGICAL DESK-BASED ASSESSMENT

Atlip Gardens, Alperton, London Borough of Brent

Project Code: JAC28989
Atlip Gardens, Alperton, Brent
draft
June 2023
Local Planning Authority:
London Borough of Brent

rpsgroup.com

Quality Management

Version	Status	Authored by	Reviewed by	Approved by	Date
1	Draft	AR	DH	DH	June 23

Click or tap here to enter text.

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E

Prepared for:

KM Development Consultancy

EXECUTIVE SUMMARY

- This archaeological desk-based assessment has been prepared by RPS for KM Development Consultancy in support of development of land known as Atlip Gardens in Alperton, London Borough of Brent.
- The assessment provides a review of the site`s below-ground archaeological potential and addresses the information requirements of national and local planning policy.
- In terms of designated archaeological assets, no World Heritage Sites, Scheduled Monuments, Historic Wrecks or Historic Battlefields lie within the site or its vicinity.
- In terms of relevant local designations, the study site does not lie within an Archaeological Priority Area, as defined by the London Borough of Brent and their archaeological planning advisors.
- There are currently no recorded archaeological remains within the site boundary.
- The study site can be considered likely to have a generally low theoretical archaeological potential for all past periods of human activity.
- Past, post-depositional impacts are considered likely to have been widespread and severe as a result of historic brickearth quarrying and subsequent industrial and commercial development, such that any archaeological remains once present have been removed.
- On the basis of the available information, and in accordance with NPPF, no further archaeological mitigation measures are recommended in this particular instance.

Contents

Figures

Appendices

Appendix 1: Geotechnical Report (Ground Engineering Ltd 2019)

1 INTRODUCTION AND SCOPE OF STUDY

1.1 This archaeological desk-based assessment has been prepared by RPS for KM Development Consultancy in support of development of land known as Atlip Gardens in Alperton, London Borough of Brent.

1.2 The site, also referred to as the study site, comprises approximately 1.1ha of land centred at NGR TQ 18157 83760 with address 1-25 inc Atlip Centre, Land between Atlip Centre and railway line, Atlip Road, Land between 181 & 183 Ealing Road and 197 Ealing Road, Alperton.

1.3 In accordance with the guidance provided in the NPPF and the requirements of local planning policy, this assessment draws together the available archaeological, topographic and land-use information in order to clarify the archaeological potential of the site.

1.4 This desk-based assessment comprises an examination of evidence from the Greater London Historic Environment Record (HER), published and unpublished material and charts historic land-use through a map regression exercise.

1.5 The Assessment therefore enables relevant parties to assess the significance of designated and undesignated archaeological assets on or near the site, to consider the impact of the proposed development on the significance of these assets and to consider the need for design, civil engineering, and/or archaeological solutions to the archaeological potential identified.

1.6 The scope of this report addresses below ground archaeology only.

2 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK

2.1 National legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002, updated April 2014.

2.2 In March 2012, the government published the National Planning Policy Framework (NPPF), and it was last updated in July 2021. The NPPF is supported by the National Planning Practice Guidance (NPPG), which was published online 6th March 2014 and is periodically updated (https://www.gov.uk/ guidance/conserving-and-enhancing-the-historic-environment).

2.3 The NPPF and NPPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England: GPA 1: The Historic Environment in Local Plans; GPA 2: Managing Significance in Decision-Taking in the Historic Environment (both published March 2015). The second edition of GPA3: The Setting of Heritage Assets was published in December 2017.

National Planning Policy

2.4 Section 16 of the NPPF, entitled Conserving and enhancing the historic environment provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 16 of the NPPF can be summarised as seeking the:

- Delivery of sustainable development;
- Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
- Conservation of England's heritage assets in a manner appropriate to their significance; and
- Recognition that heritage makes to our knowledge and understanding of the past.

2.5 Section 16 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 189 states that planning decisions should be based on the significance of the heritage asset and that level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to review the potential impact of the proposal upon the significance of that asset.

2.6 *Heritage Assets* are defined in Annex 2 of the NPPF as: a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. They include designated heritage assets (as defined in the NPPF) and assets identified by the local planning authority during the process of decision-making or through the plan-making process.

2.7 Annex 2 also defines *Archaeological Interest* as a heritage asset which holds or potentially could hold evidence of past human activity worthy of expert investigation at some point.

2.8 A *Nationally Important Designated Heritage Asset* comprises a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area.

2.9 *Significance* is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

2.10 *Setting* is defined as: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

2.11 In short, government policy provides a framework which:

- Protects nationally important designated Heritage Assets;
- Protects the settings of such designations;
- In appropriate circumstances seeks adequate information (from desk based assessment and field evaluation where necessary) to enable informed decisions;
- Provides for the excavation and investigation of sites not significant enough to merit in-situ preservation.

2.12 The NPPG reiterates that the conservation of heritage assets in a manner appropriate to their significance is a core planning principle, requiring a flexible and thoughtful approach. Furthermore, it highlights that neglect and decay of heritage assets is best addressed through ensuring they remain in active use that is consistent with their conservation. Importantly, the guidance states that if complete, or partial loss of a heritage asset is justified, the aim should then be to capture and record the evidence of the asset's significance and make the interpretation publicly available. Key elements of the guidance relate to assessing harm. An important consideration should be whether the proposed works adversely affect a key element of the heritage asset's special architectural or historic interest. Additionally, it is the degree of harm, rather than the scale of development, that is to be assessed. The level of 'substantial harm' is considered to be a high bar that may not arise in many cases. Essentially, whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the NPPF. Importantly, harm may arise from works to the asset or from development within its setting. Setting is defined as the surroundings in which an asset is experienced and may be more extensive than the curtilage. A thorough assessment of the impact of proposals upon setting needs to take into account, and be proportionate to, the significance of the heritage asset and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.

2.13 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

Local Planning Policy

The London Plan

2.14 The relevant Strategic Development Plan framework is provided by the London Plan 2021 (published March 2021). Chapter 7 'Heritage and Culture' contains polices HC1 to HC7, and of particular relevance to archaeology at the study site is policy HC1 as follows:

POLICY HC1 HERITAGE CONSERVATION AND GROWTH

A. BOROUGHS SHOULD, IN CONSULTATION WITH HISTORIC ENGLAND, LOCAL COMMUNITIES AND OTHER STATUTORY AND RELEVANT ORGANISATIONS, DEVELOP EVIDENCE THAT DEMONSTRATES A CLEAR UNDERSTANDING OF LONDON'S HISTORIC ENVIRONMENT. THIS EVIDENCE SHOULD BE USED FOR IDENTIFYING, UNDERSTANDING, CONSERVING, AND ENHANCING THE HISTORIC ENVIRONMENT AND HERITAGE ASSETS, AND IMPROVING ACCESS TO, AND INTERPRETATION OF, THE HERITAGE ASSETS, LANDSCAPES AND ARCHAEOLOGY WITHIN THEIR AREA.

B. DEVELOPMENT PLANS AND STRATEGIES SHOULD DEMONSTRATE A CLEAR UNDERSTANDING OF THE HISTORIC ENVIRONMENT AND THE HERITAGE VALUES OF SITES OR AREAS AND THEIR RELATIONSHIP WITH THEIR SURROUNDINGS. THIS KNOWLEDGE SHOULD BE USED TO INFORM THE EFFECTIVE INTEGRATION OF LONDON'S HERITAGE IN REGENERATIVE CHANGE BY:

1. **SETTING OUT A CLEAR VISION THAT RECOGNISES AND EMBEDS THE ROLE OF HERITAGE IN PLACE-MAKING**

2. **UTILISING THE HERITAGE SIGNIFICANCE OF A SITE OR AREA IN THE PLANNING AND DESIGN PROCESS**
3. **INTEGRATING THE CONSERVATION AND ENHANCEMENT OF HERITAGE ASSETS AND THEIR SETTINGS WITH INNOVATIVE AND CREATIVE CONTEXTUAL ARCHITECTURAL RESPONSES THAT CONTRIBUTE TO THEIR SIGNIFICANCE AND SENSE OF PLACE**
4. **DELIVERING POSITIVE BENEFITS THAT CONSERVE AND ENHANCE THE HISTORIC ENVIRONMENT, AS WELL AS CONTRIBUTING TO THE ECONOMIC VIABILITY, ACCESSIBILITY AND ENVIRONMENTAL QUALITY OF A PLACE, AND TO SOCIAL WELLBEING.**

C. DEVELOPMENT PROPOSALS AFFECTING HERITAGE ASSETS, AND THEIR SETTINGS, SHOULD CONSERVE THEIR SIGNIFICANCE, BY BEING SYMPATHETIC TO THE ASSETS' SIGNIFICANCE AND APPRECIATION WITHIN THEIR SURROUNDINGS. THE CUMULATIVE IMPACTS OF INCREMENTAL CHANGE FROM DEVELOPMENT ON HERITAGE ASSETS AND THEIR SETTINGS SHOULD ALSO BE ACTIVELY MANAGED. DEVELOPMENT PROPOSALS SHOULD AVOID HARM AND IDENTIFY ENHANCEMENT OPPORTUNITIES BY INTEGRATING HERITAGE CONSIDERATIONS EARLY ON IN THE DESIGN PROCESS.

D. DEVELOPMENT PROPOSALS SHOULD IDENTIFY ASSETS OF ARCHAEOLOGICAL SIGNIFICANCE AND USE THIS INFORMATION TO AVOID HARM OR MINIMISE IT THROUGH DESIGN AND APPROPRIATE MITIGATION. WHERE APPLICABLE, DEVELOPMENT SHOULD MAKE PROVISION FOR THE PROTECTION OF SIGNIFICANT ARCHAEOLOGICAL ASSETS AND LANDSCAPES. THE PROTECTION OF UNDESIGNATED HERITAGE ASSETS OF ARCHAEOLOGICAL INTEREST EQUIVALENT TO A SCHEDULED MONUMENT SHOULD BE GIVEN EQUIVALENT WEIGHT TO DESIGNATED HERITAGE ASSETS.

E. WHERE HERITAGE ASSETS HAVE BEEN IDENTIFIED AS BEING AT RISK, BOROUGHS SHOULD IDENTIFY SPECIFIC OPPORTUNITIES FOR THEM TO CONTRIBUTE TO REGENERATION AND PLACE-MAKING, AND THEY SHOULD SET OUT STRATEGIES FOR THEIR REPAIR AND RE-USE.

2.15 The relevant Development Plan framework is provided by the London Borough of Brent's Local Plan 2019-2014, adopted February 2022, which contains the following policy relevant to archaeology:

<u>POLICY BHC1: BRENT'S HERITAGE ASSETS</u>

PROPOSALS FOR OR AFFECTING HERITAGE ASSETS SHOULD:

a. **DEMONSTRATE A CLEAR UNDERSTANDING OF THE ARCHAEOLOGICAL, ARCHITECTURAL OR HISTORIC SIGNIFICANCE AND ITS WIDER CONTEXT;**
b. **PROVIDE A DETAILED ANALYSIS AND JUSTIFICATION OF THE POTENTIAL IMPACT (INCLUDING INCREMENTAL AND CUMULATIVE) OF THE DEVELOPMENT ON THE HERITAGE ASSET AND ITS CONTEXT AS WELL AS ANY PUBLIC BENEFIT;**
c. **SUSTAIN OR ENHANCE THE SIGNIFICANCE OF THE HERITAGE ASSET, ITS CURTILAGE AND SETTING, RESPECTING AND REINFORCING THE STREETSCENE, FRONTAGES, VIEWS, VISTAS, STREET PATTERNS, BUILDING LINE, SITING, DESIGN, HEIGHT, PLOT AND PLANFORM AND ENSURE THAT EXTENSIONS ARE NOT OVERLY DOMINATING;**
d. **CONTRIBUTE TO LOCAL DISTINCTIVENESS, BUILT FORM, CHARACTER AND SCALE OF HERITAGE ASSETS BY GOOD QUALITY, CONTEXTUAL, SUBORDINATE DESIGN, AND THE USE OF APPROPRIATE MATERIALS AND EXPERTISE, AND IMPROVING PUBLIC UNDERSTANDING AND APPRECIATION;**
e. **SEEK TO AVOID HARM IN THE FIRST INSTANCE. SUBSTANTIAL HARM OR LOSS SHOULD BE EXCEPTIONAL, ESPECIALLY WHERE THE ASSET IS OF HIGH SIGNIFICANCE. ANY PROPOSED HARM TO OR LOSS OF A HERITAGE ASSET (INCLUDING TO ITS SETTING) SHOULD REQUIRE CLEAR AND CONVINCING JUSTIFICATION AND CAN BE OUTWEIGHED BY MATERIAL PLANNING CONSIDERATIONS IN THE FORM OF PUBLIC BENEFITS BUT ONLY IF THESE ARE SUFFICIENTLY POWERFUL.;**

f. WHERE DEMOLITION IS PROPOSED DETAILED PLANS FOR ANY REPLACEMENT BUILDING WILL BE REQUIRED TO ALLOW CONSIDERATION OF WHETHER THE REPLACEMENT WOULD CONTRIBUTE POSITIVELY TO THE CHARACTER OR WILL BE APPLIED TO ENSURE CONSTRUCTION OF THE APPROVED SCHEME IS IMPLEMENTED TOGETHER WITH AGREED MITIGATION MEASURES APPEARANCE OF THE AREA. IN CASES WHERE DEMOLITION IS PERMITTED CONDITIONS AND/OR LEGAL AGREEMENTS WILL BE APPLIED TO ENSURE CONSTRUCTION OF THE APPROVED SCHEME IS IMPLEMENTED TOGETHER WITH AGREED MITIGATION MEASURES.

2.16 In terms of relevant nationally significant designated heritage assets, the study site does not lie within the vicinity of a World Heritage Site, Scheduled Monument, Historic Battlefield or Historic Wreck.

2.17 In terms of relevant local designations, the study site does not lie within an Archaeological Priority Area, as defined by the London Borough of Brent and GLAAS.

2.18 In line with relevant planning policy and guidance, this desk-based assessment seeks to clarify the study site's archaeological potential, together with the likely significance of that potential, and the need or otherwise for additional mitigation measures.

3 GEOLOGY AND TOPOGRAPHY

Geology

3.1 The solid geology of the study site is recorded as London Clay deposits forming the London Basin (The British Geological Survey 2017). The BGS has no records of the superficial geology.

3.2 Site-specific geotechnical data (Ground Engineering Ltd 2019, Appendix 1) recorded made ground from ground level to 1.6m- 3.6m depth comprising a mixed, course-grained fill of clay, silt, sand and gravel with inclusions of concrete, wood, mortar, plastic and other waste material. Beneath this at 28.15m Above Ordnance Datum/AOD to 30.70m AOD was highly weathered London Clay consisting of firm, brown/orange-brown and grey mottled, silty clay. Groundwater strikes were recorded at between 1.7m and 3.6m depth below ground level, within the made ground.

3.3 The geotechnical data indicates the site has been previously heavily truncated down to London Clay, with the loss of the superficial soil horizons. This is supported by historic map evidence (Fig. 7), which shows the site within a brickfield and therefore subject to quarrying activity.

Topography

3.4 The natural topography of the site has been lost through development and landscaping. There is currently a gentle slope downwards from approximately 33.8m AOD at the northwest extent to 32.1m AOD at the southeast extent of the site.

3.5 The Grand Junction Canal, which opened in 1801, runs 100m to the south of the site and the River Brent flows approximately 500m to the south of the site.

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND WITH ASSESSMENT OF SIGNIFICANCE

Timescales used in this report

Prehistoric

Palaeolithic	900,000	-	12,000 BC
Mesolithic	12,000	-	4,000 BC
Neolithic	4,000	-	1,800 BC
Bronze Age	1,800	-	600 BC
Iron Age	600	-	AD 43

Historic

Roman	AD 43	-	410
Saxon/Early Medieval	AD 410	-	1066
Medieval	AD 1066	-	1485
Post Medieval	AD 1486	-	1799
Modern	AD 1800	-	Present

Introduction

4.1 What follows comprises a review of archaeological findspots within a 1km radius of the study site, also referred to as the study area, held on the Greater London Historic Environment Record (GLHER), together with a historic map regression exercise charting the development of the study area from the eighteenth century onwards until the present day.

4.2 In terms of designated heritage assets, no nationally designated Scheduled Monuments, Historic Battlefield sites, Historic Wreck sites or Historic Parks and Gardens lie within the vicinity of the study site. In addition, the site does not lie within an Archaeological Priority Area as defined by the London Borough of Brent.

4.3 In general there are few GLHER findspots within the study area, with the bulk of the entries comprising documentary references relating to Medieval settlement.

4.4 Chapter 5 subsequently considers the site conditions and whether the theoretical potential identified in this chapter is likely to survive.

Previous Archaeological Work

4.5 Several archaeological interventions within the study area search radius have revealed negative or neutral archaeological information. Evaluation at 149 Ealing Road to the north of the site revealed Post Medieval and Modern remains (Fig. 2- 164348, TQ18202 84130), as did evaluations at 414A and 416 Ealing Road, south of the study site (166250, TQ1812 8321). Evaluations at the Park Royal Guinness site to the southeast revealed modern truncation and residual earlier material (162454, TQ1903 8270). Modern remains were also identified during evaluations at Twyford Abbey Road to the southeast (156107, TQ18957 82951).

Prehistoric – Palaeolithic, Mesolithic, Neolithic, Bronze Age & Iron Age

4.6 The sole find of early Prehistoric date identified on the GLHER within the 1km study area comprises a Palaeolithic handaxe identified at St James' Gardens to the north of the study site (137616, TQ1800 8400).

4.7 From around 4000 BC the mobile hunter-gathering economy of the Mesolithic gradually gave way to a more settled agriculture-based subsistence. The pace of woodland clearance to create arable and pasture-based agricultural land varied regionally and locally, depending on a wide variety of climatic, topographic, social and other factors. The trend was one of a slow, but gradually increasing pace of forest clearance.

4.8 No finds of later Prehistoric date have been identified on the study site or wider study area. The paucity of evidence indicates the theoretical archaeological potential of the study site for these periods can be categorised as low.

Roman

4.9 There are no finds of Roman material recorded on the site or wider study area. During this period the study site is thought to have lain in a sparsely populated area predominantly comprising of pastureland.

4.10 Overall, the archaeological potential of the study site for this period can be defined as low.

Anglo-Saxon/Early Medieval/Medieval

4.11 A focus of settlement at West Twyford, ~800m south of the study site, is believed to have been established by the Saxon period (108412, TQ1832 8290). The site of the manorial mill has been identified on the River Brent ~650m south of the site (99362; TQ1840 8320).

4.12 The sole Saxon find recorded on the GLHER within the study area comprises residual pottery of possible Saxon date identified at Twyford Abbey Road, ~1km southeast of the site (96559, TQ19048 83199).

4.13 During the Anglo-Saxon period the study site probably lay in an area of unimproved or agricultural land. The archaeological potential of the study site for this period can be categorised as low.

4.14 Alperton never attained village status in the Later Medieval or Post Medieval periods, instead the settlement comprised a nucleation of farmsteads. The site of a farmstead of Medieval origin has been identified ~450m NNE of the study site. In 1199 the name was spelt 'Alprinton' translating as a farm or estate in Ealhbeorht's Territory (135287; TQ1831 8419). Tenements, first referenced in the mid fourteenth century, are also recorded at this location (119692, TQ1820 8390), with additional examples south of the site (103531; TQ1810 8360; 107152, TQ1825 8325; 145922, TQ1820 8340) and also to the northeast (139803, TQ1830 8420).

4.15 The location of a bridge over the River Brent, first mentioned in1432-3, is recorded ~600m south of the study site (144984, TQ1824 8317).

4.16 The study site's theoretical archaeological potential for significant, ie settlement, remains from the Medieval period can be identified as generally low. Evidence of agricultural activity and land division may conceivably have been present.

Post Medieval & Modern (including map regression exercise)

4.17 There are no Post Medieval or Modern remains recorded on the HER for the study site.

4.18 During these periods, our understanding of settlement, land-use and the utilisation of the landscape is enhanced by cartographic and documentary sources, which can give additional detail to data contained within the HER.

4.19 The earliest map presented in this assessment is John Rocque's Map of 1746 (Fig. 3), which shows the approximate location of the study site within parcels of enclosed, open ground to the south of a precursor of Ealing Road.

4.20 No additional detail or change is shown within the study site on the 1807 Ordnance Survey Drawing (Fig. 4). The Grand Junction Canal is shown to the south of the site, which had opened in 1801.

4.21 The site can be accurately located on the 1818 Harrow Enclosure Map (Fig. 5) which continues to show the site as undeveloped and forming part of enclosed field plots. There are no notable changes by 1866 (Fig. 6).

4.22 The 1897 Ordnance Survey Map (Fig. 7) shows the first development of the site, with its near entirety located within the 'Mission Room Brick Field'. The Alperton area became known for brick and tile production during the nineteenth century (Weinreb, Hibbert & Keay 2008: 21-2) and this evidence for clay extraction on the site itself is supported by recent geotechnical data (see Section 3.2 above and Appendix 1). Additional details include a pond/infilled quarry located at the southwest boundary and buildings shown off Ealing road at the northwest and also at the southeast extent of the site.

4.23 The 1914 Ordnance Survey Map (Fig. 8) shows new industrial development on the site, with a 'Rubber Works' complex taking up the majority of the site area. A building shown on the earlier 1897 map is now labelled 'Gospel Hall'.

4.24 A 1945 aerial photograph (Fig. 9) indicates industrial activity had expanded across the site, with the footprint taken up by a mass of buildings that incorporated saw-tooth roofs. By 1958 (Fig. 9), the site hosted a furniture works and there is little change shown by 1970 (Fig. 10).

4.25 The 1991 Ordnance Survey Map (Fig. 11) indicates that by this time the site had been wholly redeveloped to approximately its current configuration. There are no further substantive changes up to the present day (Figs. 12-15).

4.26 Based on the above, the potential of the study site for significant Post Medieval and Modern remains can be identified as low.

Assessment of Significance

4.27 Existing national policy guidance for archaeology (the NPPF as referenced in section 2) enshrines the concept of the 'significance' of heritage assets. Significance as defined in the NPPF centres on the value of an archaeological or historic asset for its 'heritage interest' to this or future generations.

4.28 In terms of relevant designated heritage assets, the study site does not lie within the vicinity of a World Heritage Site, Scheduled Monument, Historic Battlefield or Historic Wreck.

4.29 In terms of relevant local designations, the study site does not lie within an Archaeological Priority Area, as defined by the London Borough of Brent and GLAAS.

4.30 As identified by desk based work, archaeological potential by period and the likely significance of any archaeological remains which may be present is summarised in table form below:

Period:	Identified Archaeological Potential and Likely Level of Importance (if present):
Early Prehistoric (Palaeolithic & Mesolithic)	Low potential, Low (Local) to Moderate (Regional) importance
Neolithic	Low potential, Low (Local) importance
Bronze Age	Low potential, Low (Local) importance
Iron Age	Low potential, Low (Local) importance

Roman	Low potential, Low (Local) importance
Anglo-Saxon & Medieval	Low potential, Low (Local) importance
Post Medieval	Low potential, Low (Local) importance
Modern	Low potential, Low (Local) to Negligible importance

4.31 Any archaeological remains, should they occur at the study site, would in the context of the Secretary of State's non-statutory criteria for Scheduled Monuments (DCMS 2013) most likely be of overall low/local significance.

5 SITE CONDITIONS, THE PROPOSED DEVELOPMENT AND REVIEW OF POTENTIAL DEVELOPMENT IMPACTS ON ARCHAEOLOGICAL ASSETS

Site Conditions

5.1 The study site comprises approximately 1.1ha of land centred at NGR TQ 18157 83760 with address 1-25 inc Atlip Centre, Land between Atlip Centre and railway line, Atlip Road, Land between 181 & 183 Ealing Road and 197 Ealing Road, Alperton.

5.2 It is currently occupied by a three-storey brick commercial building with basement (The Atlip Centre) at its western extent, and a two-storey former commercial building at its southeastern extent surrounded by hardstanding car parking. Atlip Road bisects the site, and an electricity sub-station is located close to its southwestern boundary.

5.3 The construction of the buildings currently occupying the study site can be considered likely to have had a severe, negative archaeological impact through the excavation of basements and the cutting of foundations and services.

5.4 Historic phases of industrial development on the site can be considered to have had a similarly severe negative impact on any surviving earlier archaeological remains present on the site.

5.5 Clay (brickearth) extraction within the study site as indicated by the 1896 Ordnance Survey Map (Fig. 9) is likely to have had a further cumulative widespread, severe negative impact upon any pre-existing archaeological remains.

5.6 Historic agricultural use of the study site prior to industrial activity can be considered likely to have had a moderate, widespread negative archaeological impact.

Proposed Development

5.7 Proposals comprise redevelopment for a mixed-use development within three Blocks.

Review of Potential Development Impacts on Archaeological Assets

5.8 In terms of relevant internationally or nationally important designated archaeological assets, no World Heritage Sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites lie on or within the vicinity of the study site and therefore there would be no development impacts to any such assets.

5.9 In terms of relevant local designations, the study site is not located within an Archaeological Priority Area as defined by the London Borough of Brent and GLAAS.

5.10 There are currently no recorded archaeological remains within the site boundary.

5.11 The theoretical archaeological potential for the study site has been assessed as low for all past periods of human activity.

5.12 Groundworks associated with the construction phase of the development, including site preparation, excavation for roads, foundations, services and landscaping, can be anticipated to have an extensive impact on any surviving near-surface archaeological deposits.

5.13 However, the evidence gathered for this report has identified that there has been widespread and deep modern truncation across the site associated with its history of industrial activity that is likely to have removed any archaeological deposits once present.

5.14 As such it can be considered that the proposed redevelopment is unlikely to have a negative archaeological impact.

6 SUMMARY AND CONCLUSIONS

6.1 This archaeological desk-based assessment has been prepared by RPS for KM Development Consultancy in support of development of land known as Atlip Gardens in Alperton, London Borough of Brent.

6.2 The assessment provides a review of the site`s below-ground archaeological potential and addresses the information requirements of national and local planning policy.

6.3 In terms of designated archaeological assets, no World Heritage Sites, Scheduled Monuments, Historic Wrecks or Historic Battlefields lie within the site or its vicinity.

6.4 In terms of relevant local designations, the study site does not lie within an Archaeological Priority Area, as defined by the London Borough of Brent and their archaeological planning advisors.

6.5 There are currently no recorded archaeological remains within the site boundary.

6.6 The study site can be considered likely to have a generally low theoretical archaeological potential for all past periods of human activity.

6.7 Past, post-depositional impacts are considered likely to have been widespread and severe as a result of historic brickearth quarrying and subsequent industrial and commercial development, such that any archaeological remains once present have been removed.

6.8 On the basis of the available information, and in accordance with NPPF, no further archaeological mitigation measures are recommended in this particular instance.

SOURCES CONSULTED

General

British Library

Brent Archives

Greater London Historic Environment Record

London & Metropolitan Archives

Internet

Archaeological Data Service: http://archaeologydataservice.ac.uk

Aerial photography: http://www.britainfromabove.org.uk/

British Geological Survey: http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html

British History: http://www.british-history.ac.uk/

Domesday Book: https://opendomesday.org.uk

Historic England (National Heritage List): https://www.historicengland.org.uk/listing/the-list

Past Scape: http://www.pastscape.org.uk

Portable Antiquities Database: https://finds.org.uk/database/

NPPG: http://planningguidance.planningportal.gov.uk

World War Two bomb damage: http://www.bombsight.org/bombs/

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Greater London Archaeological Advisory Service *Standards for Archaeological Work* February 2014 unpublished document

Ground Engineering Ltd 2019 *Ground Investigation Report. Land adjacent Atlip Road Alperton Wembley. Report Reference C14666* unpublished document

Historic England *Archaeological Priority Area Guidelines* July 2016 unpublished document

Historic England (formerly English Heritage) *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* 2008 (new draft 2017)

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Historic England *Historic Environment Good Practice Advice in Planning: 3 The Setting of Heritage Assets* December 2017 unpublished document

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London Topographical Society/London & Metropolitan Archives *The London County Council Bomb Damage Maps 1939-1945*, 2005

Margary *Roman Roads in Britain* 1955

Mills *Dictionary of London Place Names* 2010

MoLAS/English Heritage *A Research Framework for London Archaeology* 2002

MoLAS/English Heritage *The Archaeology of Greater London: An Assessment of archaeological evidence for human presence in the area now covered by Greater London* 2000

Ward *The London County Council Bomb Damage Maps 1939-1945* 2015

Weinreb, Hibbert & Keay (eds.) *The London Encyclopaedia* 2008

Wymer *The Lower Palaeolithic Occupation of Britain* 2 volumes 1999

Cartographic & Imagery

1746 John Rocque's Map of Middlesex

1807 Ordnance Survey Drawing

1818 Harrow Inclosure Map

1866 Ordnance Survey Map

1896 Ordnance Survey Map

1914 Ordnance Survey

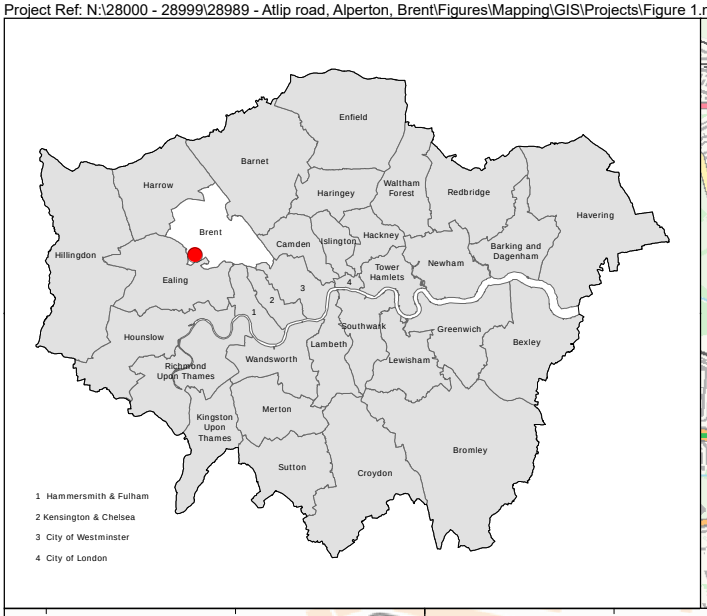
1958 Ordnance Survey Map

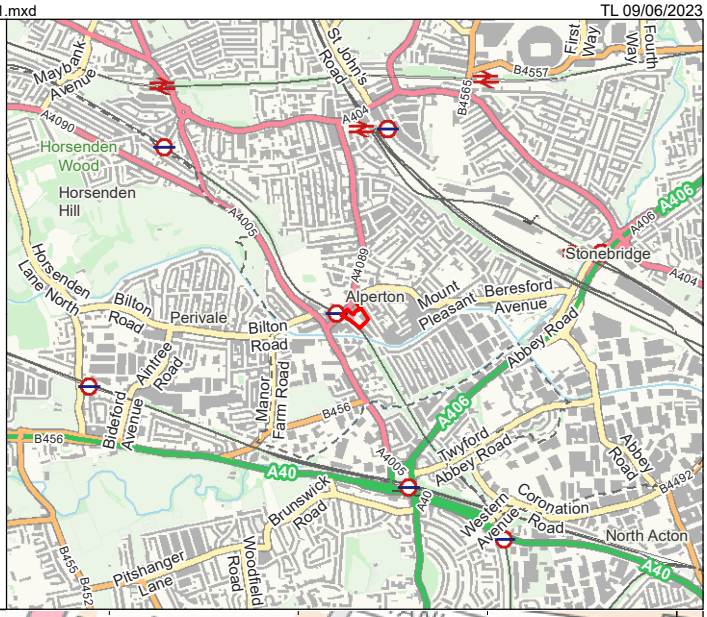
1970 Ordnance Survey Map

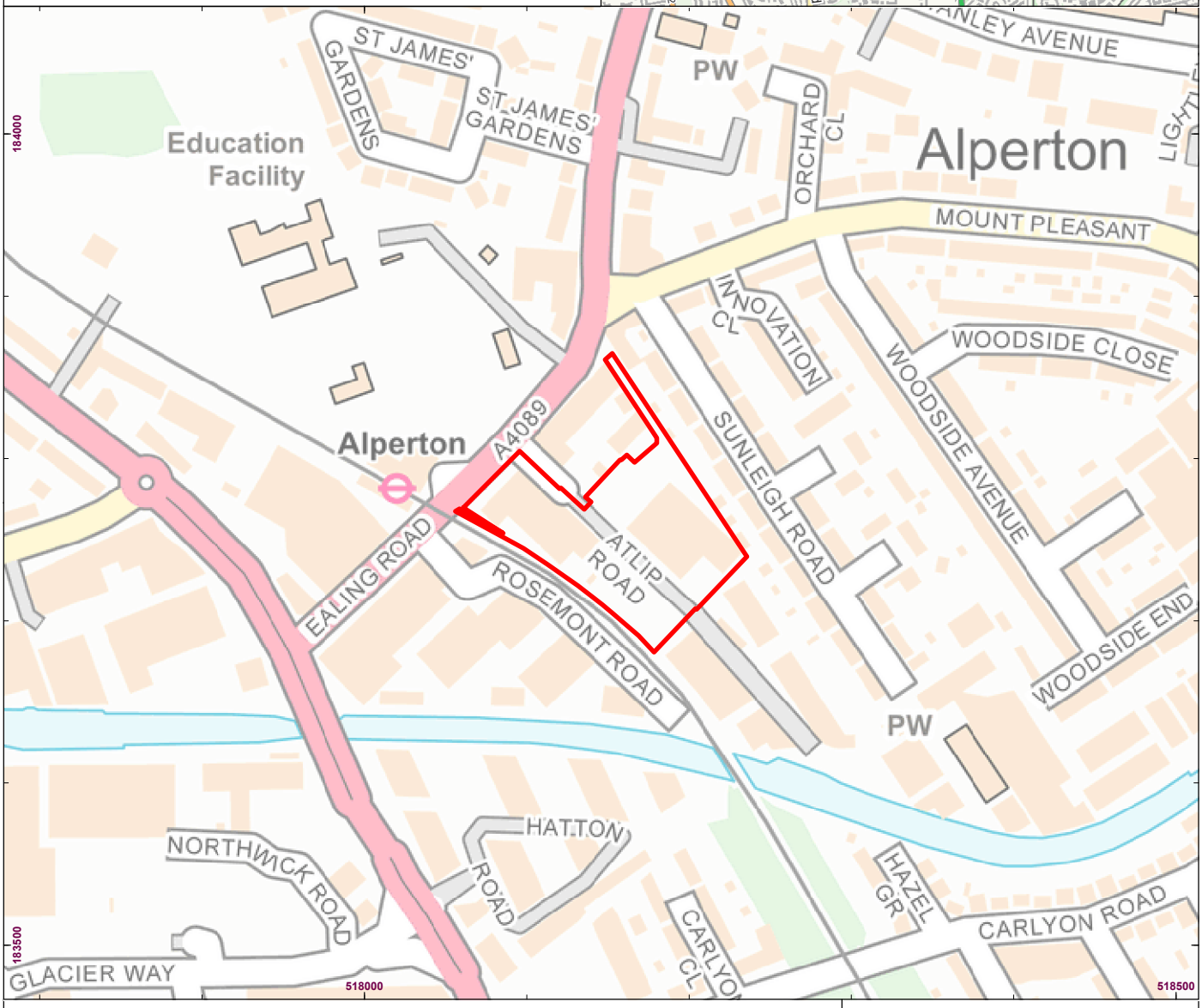
1991 Ordnance Survey Map

1945 RAF Aerial Photograph

1985 -2023 Google Earth Images







Site Boundary

N

0 50 100 m

Scale at A4: 1:4,000

rps
A TETRA TECH COMPANY

Figure 1

Site Location

TL 09/06/2023

Legend

- Site Boundary
- 1250m Site Radius

Non-designated Heritage Assets:

- HER Record (linear)

HER Record (point)

- HER Record (point)

HER Record (polygon)

- HER Record (polygon)

Archaeological Priority Areas

- 77827 Horsenden Hill
- 78466 Manor Farm Road
- 76750 The Brent River Valley and Perivale Village
- 77307 Twyford Abbey

Previous Archaeological Work:

- Event Record (polygon)

N

0 100 200m

Scale at A3: 1:10,000

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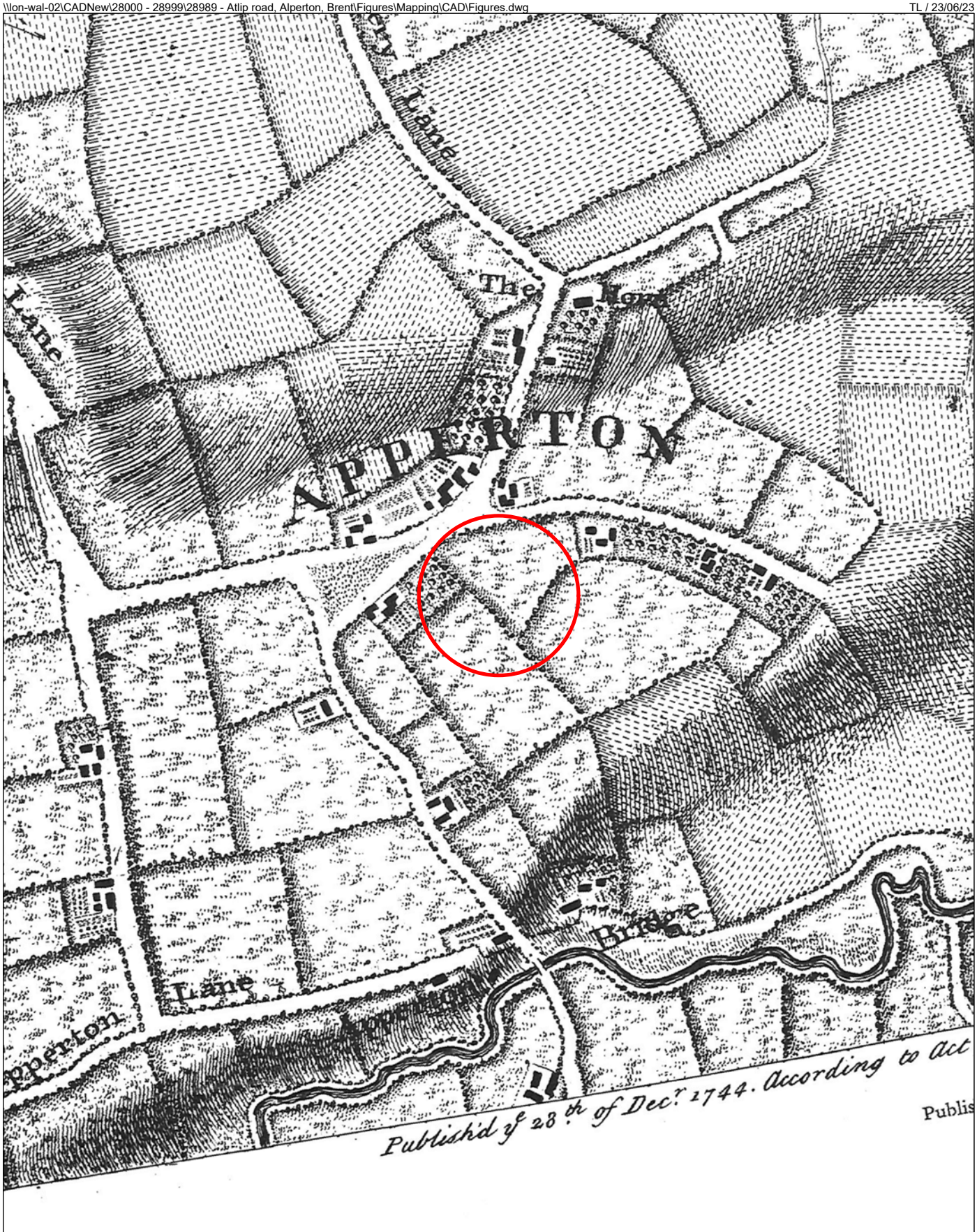
Figure 2

HER Plot
(data from GLHER)

Project Ref: N:\28000 - 28999\28989 - Atlip road, Alperton, Brent\Figures\Mapping\GIS\Projects\Figure 2.mxd



Site Boundary (approximate)

N

Not to Scale:
Illustrative Only

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Figure 3

1746 Rocque Map of London

Site Boundary (approximate)

N

Not to Scale:
Illustrative Only

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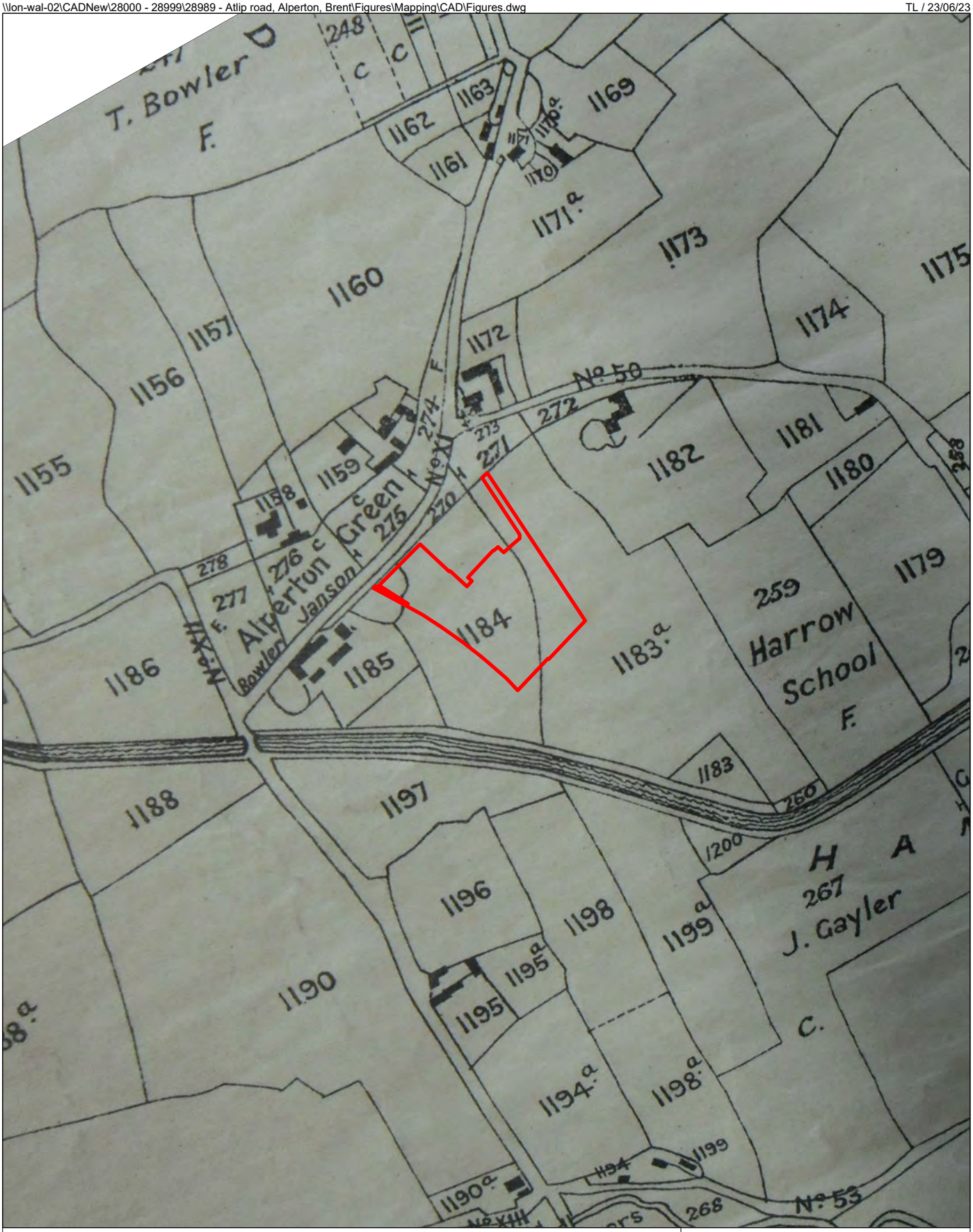
Figure 4

1807 Hampstead Ordnance Survey Drawing



Site Boundary (approximate)

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Not to Scale:
Illustrative Only

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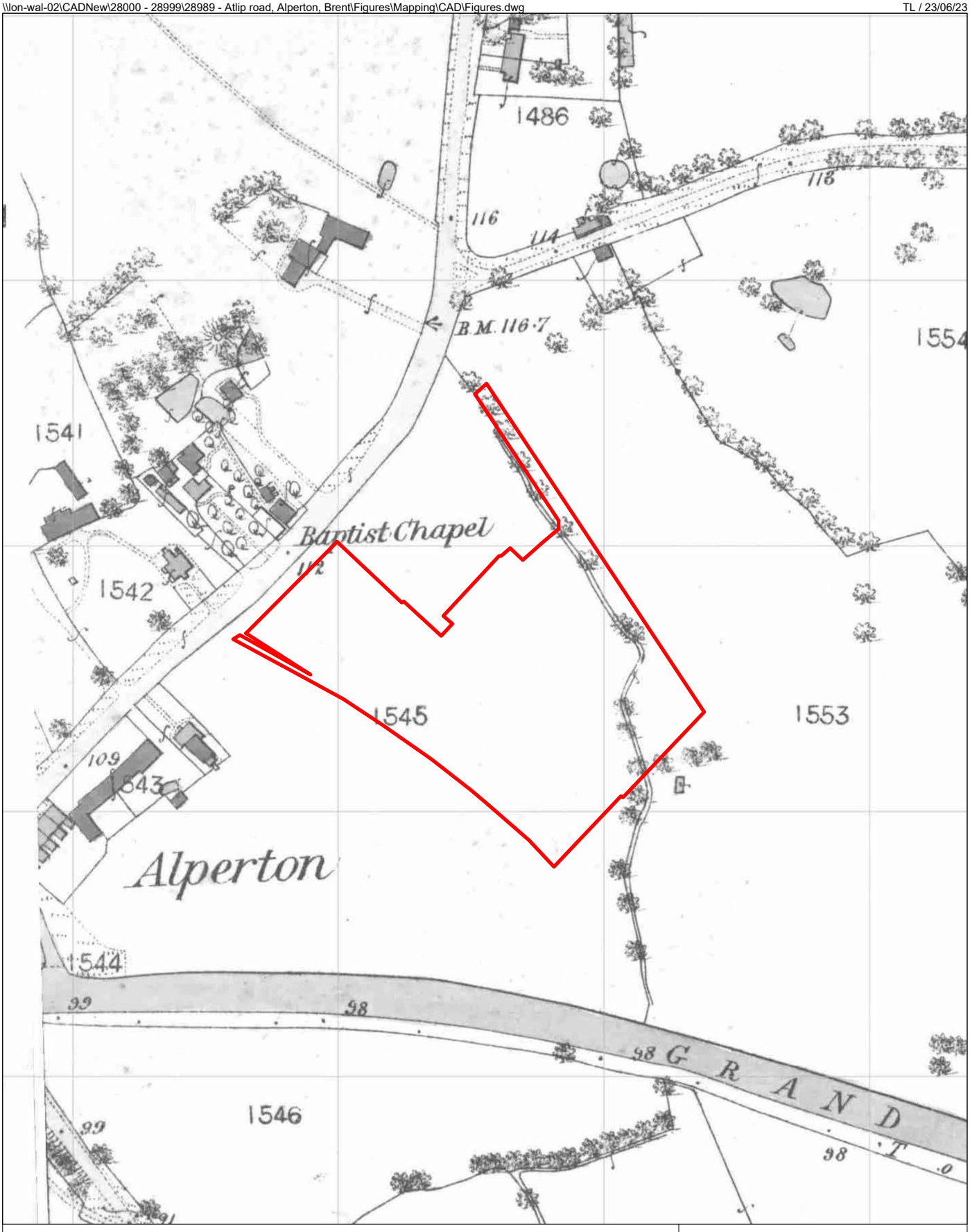
Figure 5

1818 Harrow Enclosure Map



Site Boundary

N

0 10 20 30 40 50m

Scale at A4: 1:2,000

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Figure 6

1866 Ordnance Survey Map

Site Boundary

N

0 10 20 30 40 50m

Scale at A4: 1:2,000

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Figure 7

1896 Ordnance Survey Map

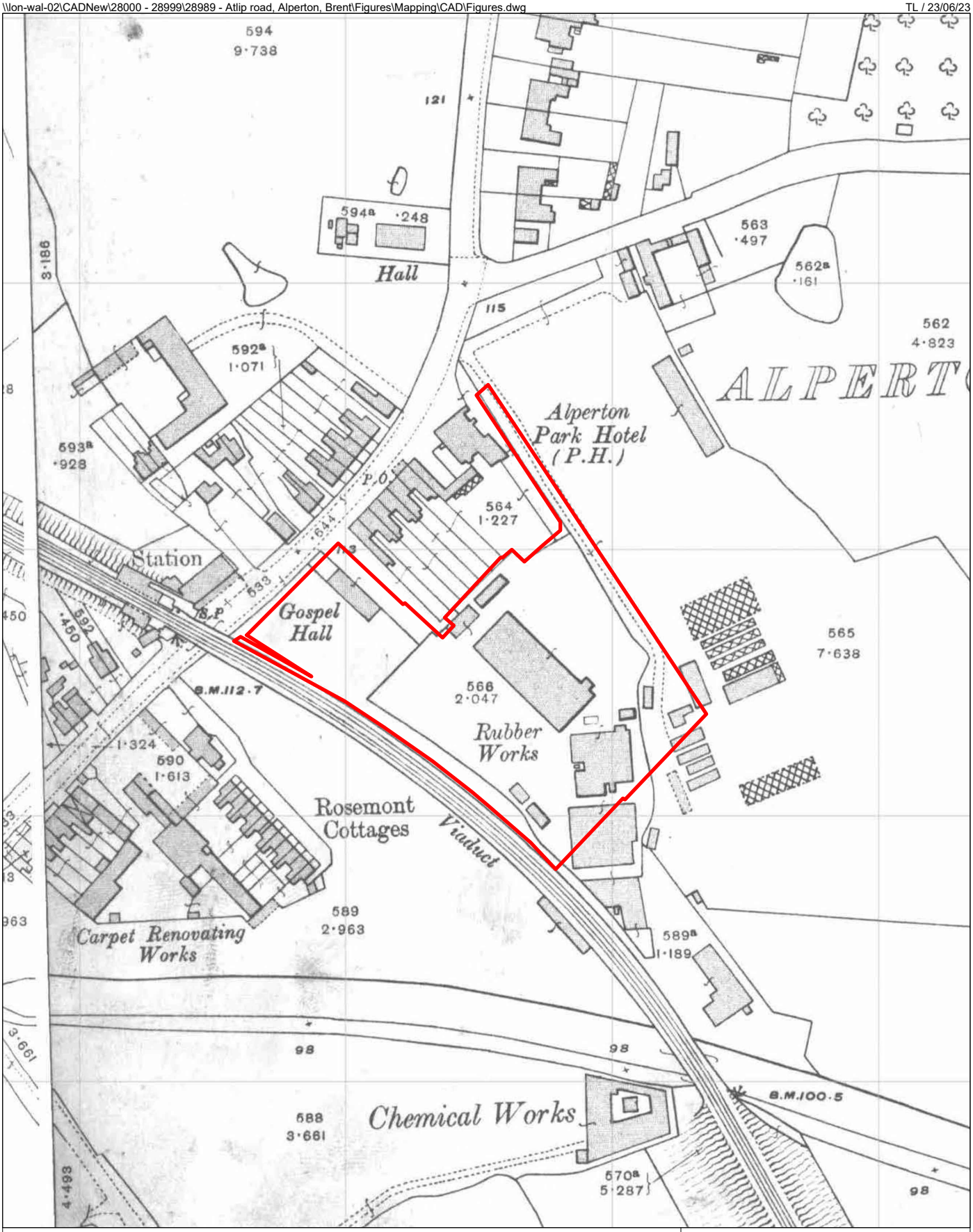

Figure 8

1914 Ordnance Survey Map

Site Boundary

N

Not to Scale:
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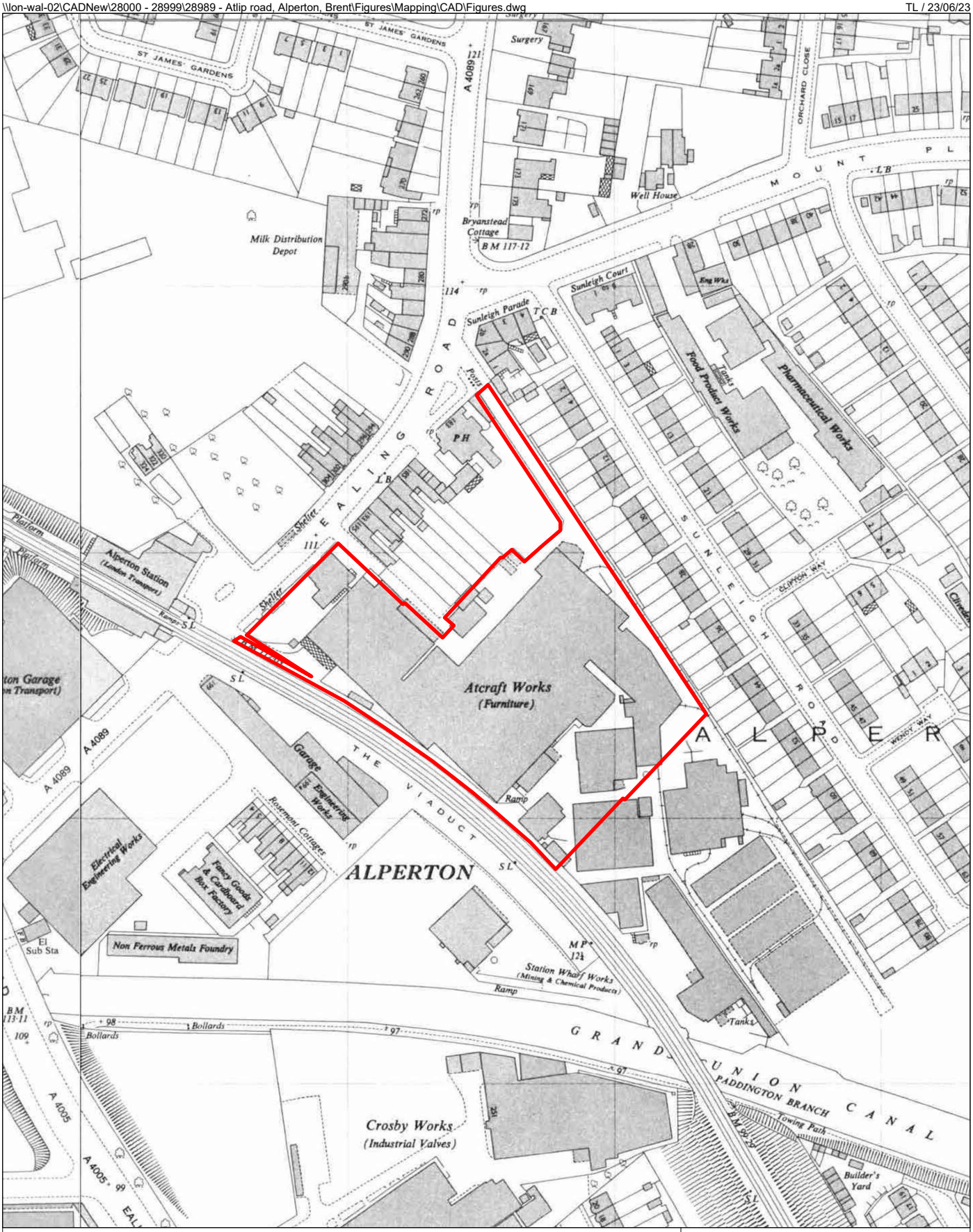
Figure 9

1945 RAF Aerial Photograph



Site Boundary

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Scale at A4: 1:2,000

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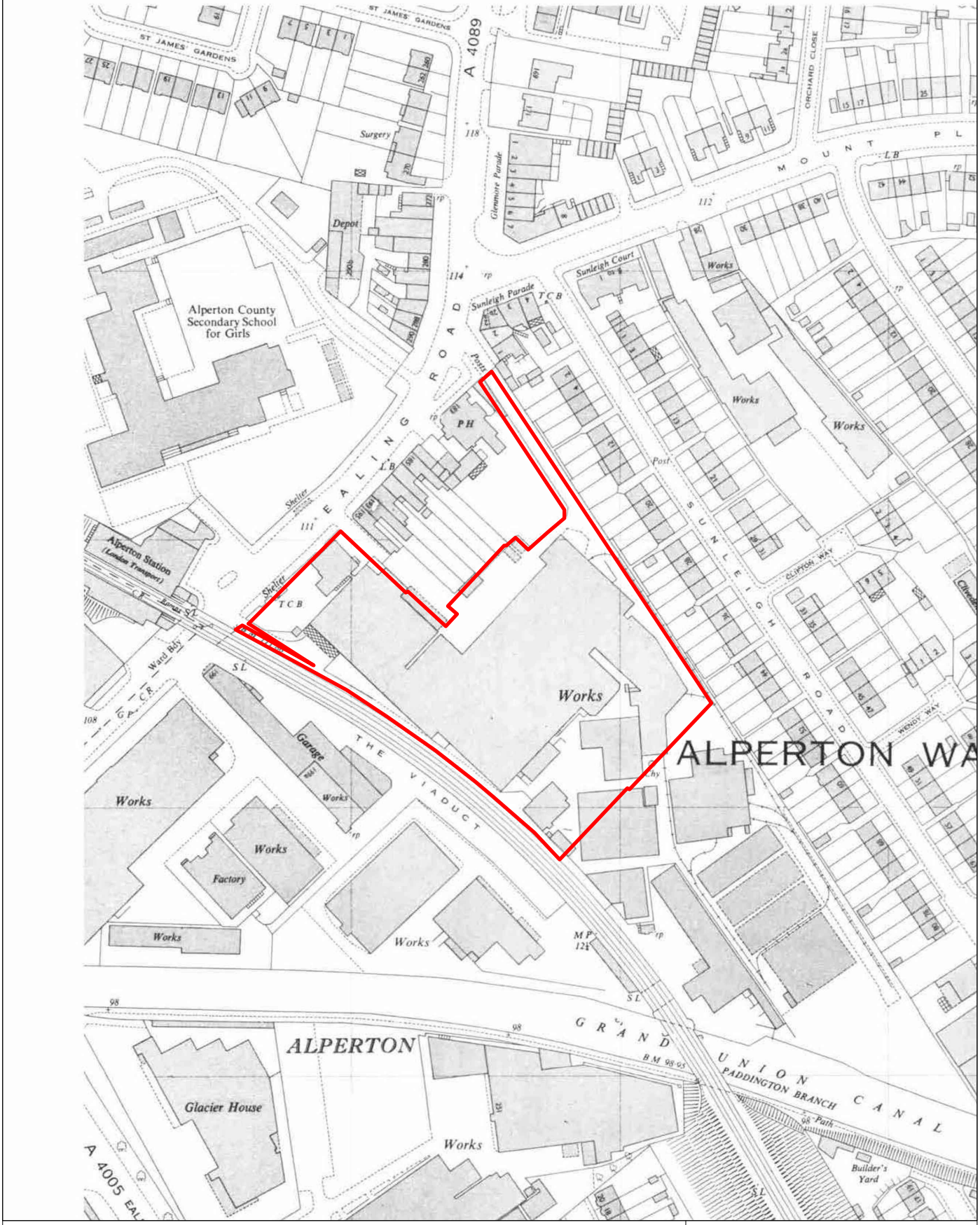
Figure 10

1958 Ordnance Survey Map



Site Boundary

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Scale at A4: 1:2,000

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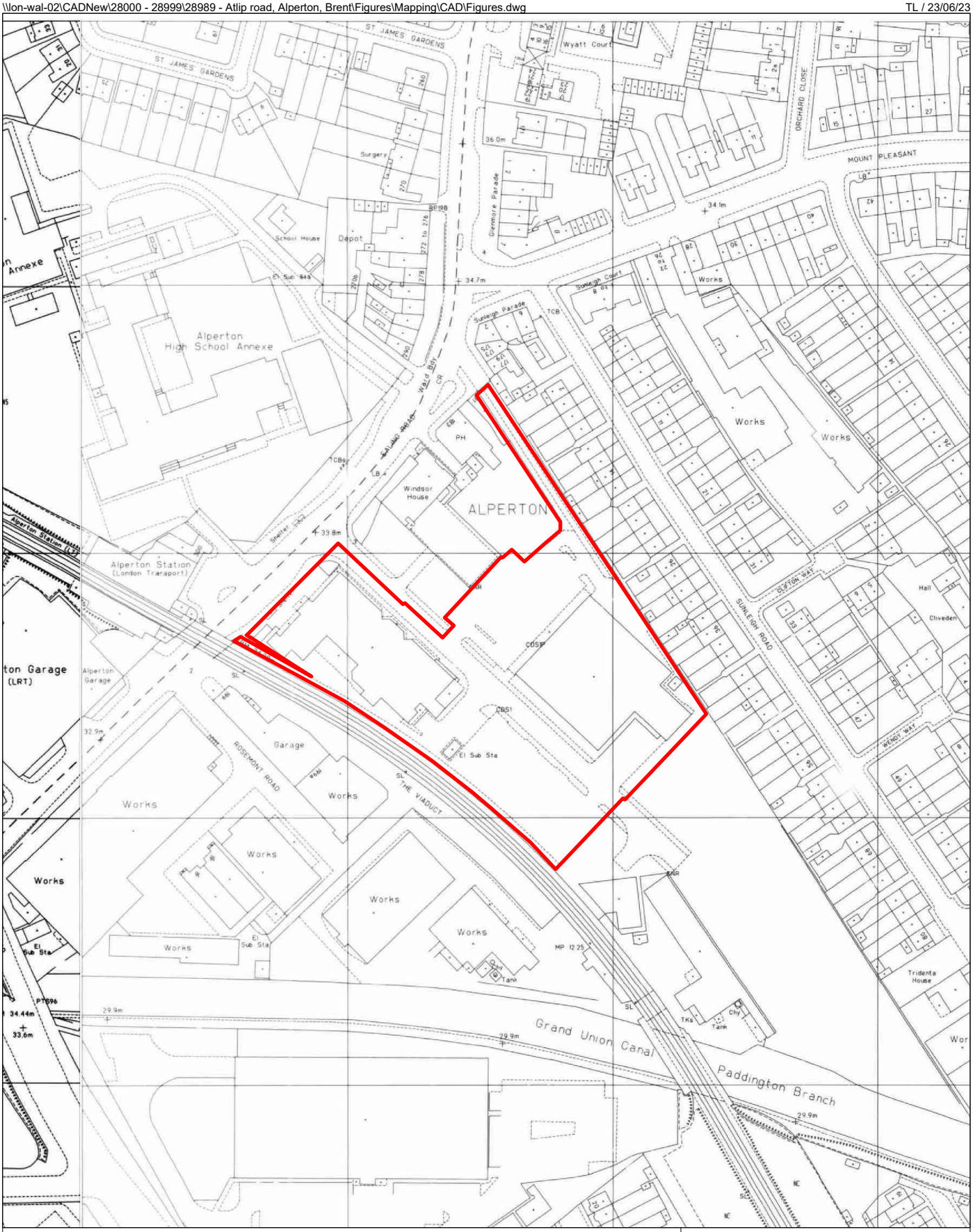
Figure 11

1970 Ordnance Survey Map



Site Boundary

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Scale at A4: 1:2,000

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Figure 12

1991 Ordnance Survey Map

Site Boundary

N

Not to Scale:
Illustrative Only

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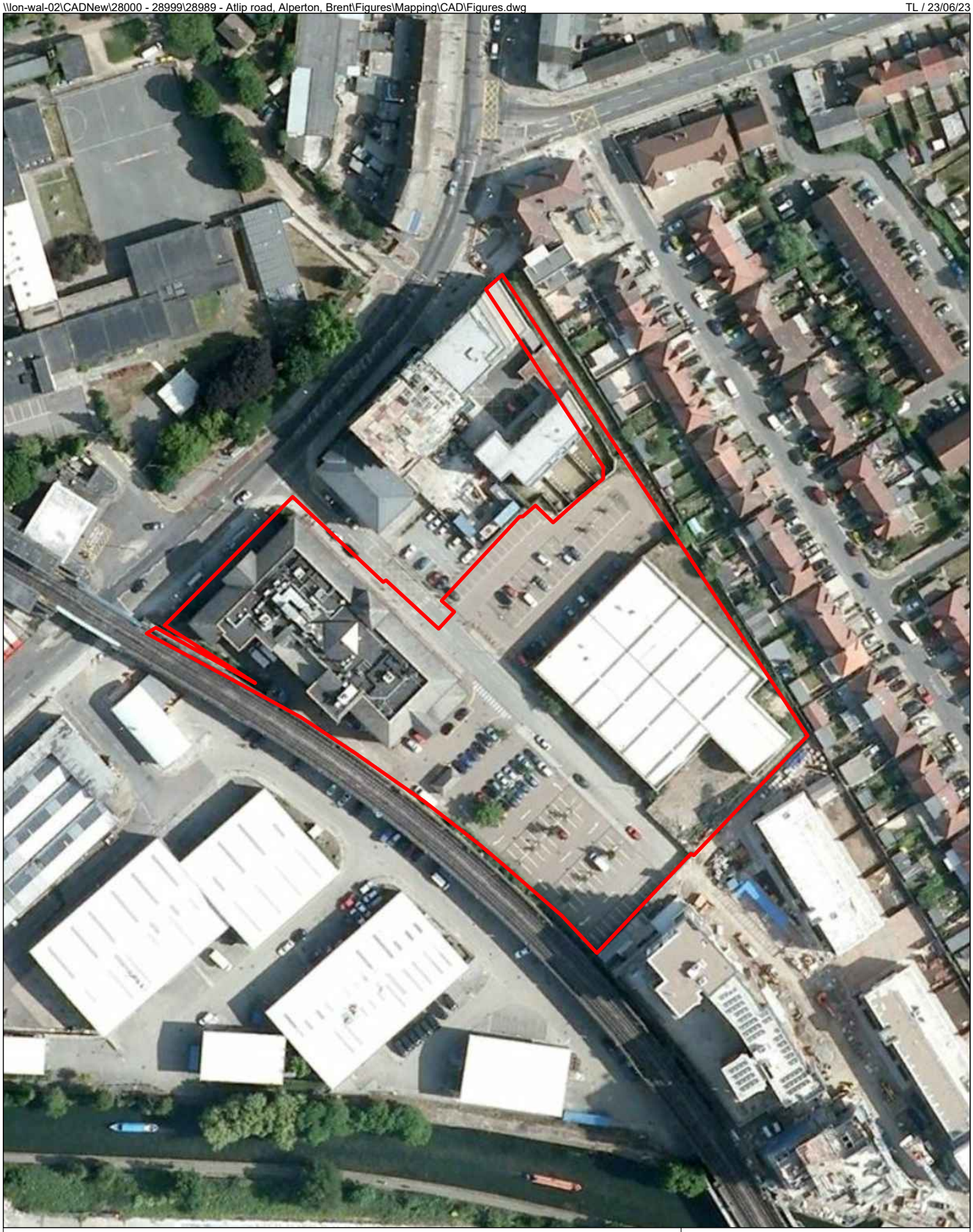
Figure 13

2002 Google Earth Image



Site Boundary

N

Not to Scale:
Illustrative Only

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Figure 14

2010 Google Earth Image

Site Boundary

N

Not to Scale:
Illustrative Only

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Figure 15

2022 Google Earth Image

APPENDICES

APPENDIX 1:

Geotechnical Report ((Ground Engineering Ltd 2019)

GROUND ENGINEERING LIMITED

Newark Road
Peterborough
PE1 5UA
Tel:
e: admin@groundengineering.co.uk
Company Registration Number 692957

GROUND INVESTIGATION REPORT

LAND ADJACENT ATLIP ROAD
ALPERTON
WEMBLEY

Report Reference C14666

On behalf of:-

Atlip House Limited
1st Floor
Kirkland House
11-15 Peterborough Road
Harrow
HA1 2AX

May 2019

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SITE LOCATION PLAN

EXPLORATORY HOLE LOCATION PLAN

BOREHOLE & TRIAL PIT RECORDS

SOAKAWAY TEST RESULTS

GROUNDWATER AND GAS MONITORING RESULTS

GEOTECHNICAL LABORATORY TEST RESULTS

CHEMICAL LABORATORY TEST RESULTS

FIGURE 1 ï SPT ôNõ/Depth Plot

FIGURE 2 ï Apparent Cohesion/Depth Plot

FIGURE 3 ï Soil Profile

APPENDIX 1 Classification of Aggressive Chemical Environment for Buried Concrete

ATLIP HOUSE LIMITED

PETER PENDLETON & ASSOCIATES LIMITED

CONSULTING ENGINEERS

GROUND INVESTIGATION REPORT

AT

LAND ADJACENT ATLIP ROAD

ALPERTON

WEMBLEY

Report Reference No. C14666 **May 2019**

INTRODUCTION

The client, Atlip House Limited, proposes to redevelop the land adjacent Atlip Road, Alperton, Wembley for mixed residential, retail and church uses. The redevelopment is understood to comprise four mixed use tower blocks of between eleven and twenty-eight stories, with a large basement car park, re-routed access roads and areas of soft landscaping.

Ground Engineering Limited was commissioned by the client, under the direction of consulting engineers Peter Pendleton and Associated Limited, to carry out a preliminary ground investigation to determine the nature and geotechnical properties of the underlying soils, in relation to the design and construction of the foundations. A contamination assessment was also included within the scope of this report. Historical map research was provided by the client prior to the investigation.

LOCATION, TOPOGRAPHY AND GEOLOGY OF THE SITE

The site is located at the northern end of Atlip Road, on the south-eastern side of Ealing Road (A4089), in the Alperton district of the London Borough of Brent. The site is 20m south of Alperton railway station and 1.1km north of Hangar Lane railway station at National Grid Reference TQ 1814 8378. Its location is shown on the site location and site boundary plans at the rear of this report text.

Atlip Road bisects the 150m long site, which extends south-west to a railway viaduct; and to the north-east to the rear gardens of houses fronting Sunleigh Road. South of Atlip Road, the south-western part of the site is between 30m and 50m wide and is sub-divided into block paved car parking, and a three-storey brick commercial building (The Atlip Centre). An electricity sub-station was located close to the south-western boundary, between the car parking and the building. North of Atlip Road, the north-eastern part of the site extends up to 60m wide and was occupied by a two-storey derelict commercial building in its south-eastern part, block paved car parking in its central area and a three-storey church building. The site extended as a narrow strip of land to the north along the eastern side of a mixed use development (Hayes Court), bordered by the rear gardens of houses on Sunleigh Road to Ealing Road to the north-west.

An Ash tree and several immature deciduous trees were present in the south-western part of the site. Peripheral areas of the site had also become overgrown with vegetation.

The site slopes down towards the south-east, from approximately 34mOD at the intersection of Atlip Road and Ealing Road, to 31mOD on Atlip Road at the south-eastern boundary of the site. The regional topography falls toward the south, to the south-westward flowing River Brent, some 600m distant. The Grand Union Canal is located 60m to the south of the site.

The geological map, sheet 256 (2004) at 1:50,000 scale, shows the site to be within an area of worked ground, underlain by the solid geology of the London Clay, designated

as an õUnproductiveô stratum, by the Environment Agency (EA). Superficial deposits of the Taplow Gravel and Alluvium were shown adjacent the River Brent to the south.

Based on maps provided by the client, historically the site was a field in 1874 and by the late 19th Century had been worked as part of Mission Room Brick Field. By 1914 a rubber works had been constructed on the site, with the brick field workings presumably infilled. In 1920 the works were taken over by a furniture manufacturer and the buildings expanded. The works were demolished in the 1980s and the existing buildings constructed in the late 20th Century.

PRELIMINARY CONCEPTUAL MODEL

Assessment of the potential linkage between ground contamination sources and human or environmental receptors have been assessed based on the historical research documented in the preceding sections of this report. A generalised preliminary conceptual model relative to the construction phase and completed development is presented below in Table 1.

Table 1: Preliminary Conceptual Model Relative to Use as Mixed Development

Receptors	Pathway	Estimated Potential for Linkage with Contaminant Sources			
		Drainage/ Existing Buildings	Soil Beneath Site	Soil Gas	Ground Contamination Outside Site Boundary
Human Health ï groundworkers	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Low likelihood	Low likelihood	Low likelihood	Unlikely
Human Health ï users of completed development	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	N/A	Low likelihood	Low likelihood	Unlikely
Water Environment	Migration through ground into surface water or groundwater	Low likelihood	Low likelihood	Unlikely	Low likelihood
Flora	Vegetation on site growing on contaminated soil	Unlikely	Unlikely	Unlikely	Unlikely
Building Materials	Contact with contaminated soil	Unlikely	Low likelihood	N/A	Unlikely

Key to Table 1 Estimated Potential for Linkage with Contaminant Source	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.
N/A	Not Applicable, as the source will be removed prior to development.

SITE WORK

The site work conducted between 7th and 22nd January 2019 comprised four cable percussion boreholes (BH1 to BH4), and one hand excavated soakaway trial pit (TP1). The positions are shown on the exploratory hole location plan and site boundary plans following this report text.

Public utility service drawings were sourced and consulted prior to determining the exploratory hole positions. The service drawings sourced by Ground Engineering Limited are available on request. Prior to excavation, a service scan was made at each position using a CAT (Cable Avoidance Tool) to check for the absence of detectable buried services that may otherwise have been damaged by the investigation.

The exploratory hole records, presented following the plans, give the descriptions and depths of the various strata encountered, details of all samples taken, in-situ tests, installation details and the groundwater conditions observed during, on completion of excavation and boring and subsequently in the borehole standpipes. Ordnance Datum (OD) levels interpolated from site datum levels on a plan provided have been added to the borehole and trial pit records.

Cable Percussive Boreholes

The boreholes (BH1 to BH4) were undertaken by a standard cable percussive boring rig between 7th and 22nd January 2019. Any near surface concrete was concrete cored on 7th January 2019 prior to commencing the boreholes. Starter pits were excavated to a depth of 1.20m at the location of each borehole to ensure the absence of buried services. The boreholes were then advanced to depths of 25.00m (BH2 and BH4) and 40.00m (BH1 and BH3) below ground level using weighted shell and claycutter tools, initially working within 150mm diameter steel casing inserted to a maximum depth of 4.20m below ground level.

Representative small disturbed (D) and bulk (B) samples of soil were taken from the boring tools at regular intervals throughout the depth of each borehole.

Standard penetration tests (SPT) were undertaken in order to give an indication of the in-situ relative density/shear strength of the soils encountered. The test was made by driving a 50mm diameter solid cone point (C) or open shoe and split spoon sampler (S) into the soil at the base of the borehole by means of an automatic trip hammer weighing 63.50kg falling freely through 760mm. The penetration resistance was determined as the number of blows (N) required to drive the tool the final 300mm of a total penetration of 450mm into the soil ahead of the borehole. The SPT results have been plotted against depth (Figure 1), are presented on the soil profile (Figure 3), and tabulated to the rear of the borehole records.

Undisturbed samples 100mm in diameter were taken at regular intervals within the clay soils, the ends of the samples were sealed to maintain them in as representative condition as possible during transit to the laboratory.

On completion of boreholes BH1 and BH3, 50mm diameter gas and groundwater monitoring standpipes were installed to 7.00m depth. The annulus around each standpipe was backfilled with pea gravel with a bentonite seal placed around the top of each installation within 1.00m or 1.10m of ground level. A gas tap was installed in the top of each standpipe and a protective stopcock cover was concreted into the ground flush with the surface. The boreholes beneath the installations, were backfilled with clean arisings. The remaining boreholes were backfilled with arisings, slabbed and the surface layers reinstated. Excess spoil was placed in a skip, pending off-site disposal to a licensed facility.

Hand Excavated Soakaway Pit

A single soakaway pit (TP1) was undertaken on 17th January 2019 to assess the drainage potential of the near-surface soils. The hole was excavated using hand tools to 1.00m depth. Small disturbed samples of soil were taken at regular intervals throughout these pits and placed in polycarbonate pots (D samples).

A soakaway test was carried out within the trial pit, in broad accordance with BRE Digest 365 (2016) in order to allow the assessment of the soil infiltration rates. The general method of the test was to excavate the trial pit with vertical sides trimmed square to the base. The

dimensions were accurately measured and recorded, and the pit was then filled with clean water. The rate of water dissipation from the pit was measured by recording the depth of water relative to a datum at frequent time intervals. Once the water had drained away, the pit was filled for a second time and the test repeated, followed by a third refill subsequently. The results are presented to the rear of the trial pit record.

On completion the spoil was returned to the pit and replaced in compacted layers and the surface layer reinstated.

Gas and Groundwater Monitoring

Three return gas monitoring visits were undertaken in February 2019 in order to monitor methane, carbon dioxide and oxygen gas levels in the borehole standpipes, in accordance with the guidelines set out in BS8576:2013. The ambient pressure and flow rate was also recorded together with the depth to groundwater. Water samples were recovered and the water levels have been added to the borehole records and soil profile in Figure 3. The gas/groundwater results are tabulated following the exploratory hole records.

LABORATORY WORK

The samples were inspected in the laboratory and assessments of the soil characteristics have been taken into account during preparation of the exploratory hole records. The soil descriptions have been made in accordance with BS5930:2015. The geotechnical test results, undertaken in accordance with BS1377:1990 & 2016, are presented following the exploratory hole records. The chemical test results follow the geotechnical test results.

Geotechnical Testing

The moisture content and index properties of selected soil samples were determined as a guide to soil classification and behaviour. The liquid limit was determined by a cone penetrometer.

Test specimens were prepared at full diameter from selected undisturbed samples. Immediate undrained triaxial compression tests were performed under single confining cell pressures. The moisture content and bulk density of each specimen was also determined. The apparent cohesion results have been plotted against depth in Figure 2.

An indication of the settlement characteristics of selected samples of clay were obtained from tests in the consolidation apparatus or oedometer. These tests were performed on 75mm diameter samples, about 19mm thick, contained in steel rings. The samples were saturated and the swelling pressure balanced prior to applying a constant load with drainage at both ends. When primary compression was complete, the load was increased and this repeated for three increments of load. The sample was then unloaded in equal stages. The rate and total amount of consolidation were continually monitored using a computer controlled E.L.E. Datasystem 7 Unit. The results were plotted and analysed by the computer for each increment of load to obtain the coefficients of compressibility (m_v), and of consolidation (c_v), which govern the amount and rate of settlement, respectively.

Selected samples of soil were analysed to determine the concentration of soluble sulphates. The pH values were also determined.

Chemical Testing

Selected soil samples from the exploratory holes were tested for total concentrations of arsenic, cadmium, chromium, lead, mercury, selenium, nickel and benzo[a]pyrene, together with speciated polyaromatic hydrocarbons (PAH), boron, copper and zinc, phenols, total and free cyanide, hexavalent chromium, sulphate, sulphide and pH. The organic content of the soil samples was also determined. Samples of made ground were also screened for total petroleum hydrocarbons (TPH), speciated TPH and asbestos containing material (ACM), with the latter identified by microscopy where present.

A sample of made ground from BH 4 at 1.20m to 1.70m depth was scheduled for a Waste Acceptance Criteria (WAC) CEN Leachate Suite at 10l/kg.

GROUND CONDITIONS

The ground conditions have been plotted as a soil profile in Figure 3. The ground conditions comprised a surface layer of made ground, underlain by the initially weathered solid geology London Clay at 1.60m to 3.60m depth (28.15mOD to 30.70mOD), which was proved to at least the base of the deepest boreholes at a maximum depth of 40.00m (-8.60mOD). Groundwater seepages were met within the made ground at depths between 1.70m and 3.00m below ground level. Groundwater was recorded ópercheddô within the made ground at between 0.62m and 1.04m depth during the return monitoring visits.

Made Ground

In the car parks, a surface layer of brick paviours was found to 0.10m depth in boreholes BH1, BH2 and BH3. These brick paviours were underlain by a 0.05m thick layer of brown bedding sand in BH1 and BH2. A 0.15m to 0.20m thick layer of concrete was found beneath the bedding sand in BH1 and BH2 and directly beneath the brick paviours in BH3.

Beneath the surface hardstanding in BH1, BH2 and BH3, and from the surface in BH4 and TP1, was a brown, locally dark brown, dark grey or grey, clayey or silty sand and gravel fill, which locally contained cobbles/boulders of concrete. This coarse grained fill had a gravel fraction of flint, brick, concrete, mortar, ceramic tile, granite, plastic, metal, coal, asphalt and ash fragments. In BH2 the coarse grained fill also contained fibres of asbestos. The coarse grained fill was generally between 0.50m and 0.95m thick, but was locally found to 3.60m depth in BH4.

In BH1, BH2 and BH3 and TP1, the coarse grained fill was underlain by a soft, locally stiff (TP1), brown, dark brown and dark grey mottled, slightly gravelly, silty clay fill, which locally contained pockets of organic material. This clay fill had a gravel fraction of flint, brick, concrete, wood and ash fragments and was found to at least 1.00m depth in TP1, and to between 1.60m and 2.80m below ground level in BH1, BH2 and BH3. In BH1 the clay fill became dark grey mottled and had a hydrocarbon odour below 1.80m depth.

The made ground beneath the site was found to depths between 1.60m and 3.60m below ground level (28.15mOD to 30.70mOD), with the deepest fill found at the south-eastern corner of the site (BH4).

London Clay

Beneath the made ground at depths between 1.60m and 3.60m, a layer of firm, brown, orange brown and grey mottled, silty clay was met in the four boreholes. This highly weathered London Clay was between 0.40m and 2.60m thick and found to between 3.00m and 4.50m below ground level (generally about 28mOD, except BH2 where it was found to 29.10mOD).

The London Clay then became a stiff, locally firm, closely fissured, brown and orange brown mottled, locally silty clay with grey or blue grey stained fissures, becoming orange brown stained fissures with depth. This weathered London Clay contained occasional selenite crystals, rare orange brown silt partings and was found to between 11.50m and 12.50m below ground level (17.90mOD to 20.25mOD).

The London Clay then became a very stiff, locally stiff, closely fissured, grey brown, locally silty clay, which contained layers of very weak mudstone, at 23.50m depth in BH3 and 32.70m depth in BH1. The London Clay was found to at least the base of the boreholes at 25.00m or 40.00m below ground level (7.10mOD to -8.60mOD).

Groundwater

Borehole BH2 and trial pit TP1 were dry during boring/excavation and on completion. Groundwater strikes were recorded at between 1.70m and 3.60m depth, within the made ground in BH1, BH3 and BH4, which were all sealed out by the casing when it was extended into the underlying London Clay. A second groundwater strike was recorded at 32.70m depth in BH1, associated with a layer of very weak mudstone.

During the three return monitoring visits, groundwater was recorded at between 0.62m and 1.04m depth (30.36mOD to 30.98mOD) in the BH1 and BH3 standpipe installations, ópercheddwithin the made ground.

Observations

Live roots were observed to 0.50m depth in TP1, but were not recorded within the four boreholes. A buried brick wall was found in TP1 below 0.50m depth.

Evidence of Contamination

Olfactory evidence of hydrocarbon contamination was found in the clay fill in BH1 below 1.80m depth. The made ground contained fragments of flint, brick, concrete, mortar, ceramic tile, granite, plastic, metal, wood, coal, asphalt, ash and asbestos containing material.

COMMENTS ON THE GROUND CONDITIONS IN RELATION TO FOUNDATION DESIGN AND CONSTRUCTION

The proposed development is understood to comprise construction of four tower blocks, with basement car parking, ground level car parking, new access roads and soft landscaping. The investigation confirmed the site to be covered by made ground, resting on the solid geology London Clay at 1.60m to 3.60m depth. The made ground should be avoided as a bearing stratum and will largely be removed were basement sub-structures are proposed. The proposed development had not been finalised at the time of report writing. The weathered solid geology clays could offer support for traditional foundations for ancillary buildings and the basement, but the tower blocks should be based on piled foundations.

Traditional Foundations

The exploratory holes encountered made ground to depths between 1.60m and 3.60m below ground level, with the made ground apparently deepening toward the south-east of the site. Large scale processes of natural sedimentation allow a certain degree of confidence to be placed in the absence of important variation of the engineering properties of natural soils across sites. By contrast, made ground, whose history is not completely known, must, despite any amount of investigation, inevitably present the possibility of conditions existing which could not be accepted when considering the material as a bearing stratum.

Samples of the London Clay had modified plasticity indices of between 45% and 54%. The results indicate the clay has a high to very high plasticity and a high volume change potential based on NHBC Standards Chapter 4.2 ôBuilding near treesô (2019). On an open site, away from the influence of trees, a minimum foundation depth of 1.00m below current or proposed ground level, whichever is deeper, would be required within the naturally deposited clays in order to be below the zone of seasonal volume change in accordance with the NHBC Standards.

An Ash tree and several immature deciduous trees were located in the south-western part of the site. The above standards should be used to determine foundation depths within the zones of influence of these trees in areas where trees are to be removed or remain alike.

Based on a mature moderate water demand Ash tree, a minimum foundation depth of 2.35m would be required in such clay soils at 1m distance from such a tree, based on NHBC Standards. Foundations would need to be at least 18m from a mature Ash tree for the adoption of the minimum foundation depth of 1.00m in clay soils on this site. Within these distances foundation depths will depend on the proximity of trees to new foundations and depths should be determined using the NHBC Standards where clay forms the base of foundation excavations. Tree species and distances to the proposed buildings should be verified before final design of foundation depths based on NHBC Standards.

In summary, foundations for any ancillary structures will need to be a minimum of 1.00m deep, and will likely be between at least 1.60m and 3.60m deep in order to penetrate the made ground. Such foundations may locally need to be stepped and extended to below 2.35m depth due to tree root influence.

Basement

The construction of an approximately 90m wide by 140m long basement should remove most if not all of the made ground, any root affected and highly weathered London Clay. Foundations for the basement walls, below the new basement floor level would be within the stiff, locally firm London Clay and could be designed using the bearing parameters below.

For a basement of the proposed size, a raft foundation may be considered for some structures. The London Clay will effectively have been pre-loaded by at least 70kN/m^2 where 4.00m of soil is to be removed. At this depth, the soils beneath an approximately 90m wide basement raft foundation would have a net maximum safe bearing capacity of 120kN/m^2 with a factor of safety of 3.0, although its bearing pressure would have to be limited to a net increase of 25kN/m^2 (approximately 95kN/m^2 gross) in order to limit settlement within 25mm. This does not consider any effect of heave.

It is estimated that theoretical base heave at the centre of an approximately 140m long and 90m wide, 4.00m deep unconfined basement excavation would be in the order of 80mm to 90mm, based on the results of the oedometer tests in the London Clay.

Bearing Capacity

The construction of a basement across much of the site will remove the made ground and highly weathered London Clay. Away from the proposed basement area, foundations for ancillary structures should have a minimum of 1.00m depth and extend through any made ground. Away from the influence of live roots, the naturally deposited firm London Clay would have a maximum net safe bearing capacity of 95kN/m^2 beneath a 0.60m wide strip footing below 1.60m depth, with a factor of safety of 3.0 applied. Total settlement beneath such foundations cast within the naturally deposited London Clay should be within tolerable limits for load bearing brickwork.

The results of the laboratory triaxial compression strength tests (Figure 2) indicate that a net safe bearing capacity of 175kN/m^2 could be applied by 0.60m wide strip foundations cast below the proposed basement level at 4m depth on the stiff weathered London Clay, and a 1.20m wide square pad at the same depth could apply 200kN/m^2. These values incorporate a factor of safety of 3.0 against general shear failure.

Excavations/Groundwater

The excavation of the basement will require the construction of close support to its sides, the control of groundwater, and the need to avoid undermining adjacent structures.

In order to construct the basement beneath this site it may be necessary to provide permanent support to neighbouring buildings, particularly the adjacent properties at the northern end of the site, which may be founded on relatively shallow strip foundations. This support can either be provided by underpinning the structures to the same depth as the proposed basement prior to basement construction or by constructing piled walls to the excavation that are adequately

propped during construction by temporary support and permanently by the basement and ground floors, to prevent movement at the top of the retaining walls, or a combination of the two.

Contiguous or secant piled walls around the perimeter of the basement should be taken to sufficient depth to mobilise adequate passive pressure below the basement level. The excavation of the basement could then be undertaken easily using mechanical plant within the piled walls, although it should be noted that mass concrete, contiguous or sheet pile lined excavations may not be water tight.

CIRIA report C760 'Guidance on Embedded Retaining Wall Design' (2017) indicates very small scale horizontal and vertical movements resulting from the construction of a secant piled wall embedded in stiff clay, as does the use of high support stiffness (high propped walls and top down construction) to the basement excavation. Provided that such a very stiff bracing system is used to prevent deflection of the proposed basement walls, and that the neighbouring structures are of robust construction, the anticipated level of structural damage, if any, would fall within Category 1 'very slight' as described in Table 6.4 of the aforementioned CIRIA document.

The advice of specialist groundworks contractors with experience of constructing such basements should be sought, particularly in respect of other potential methods of providing support to the sides of the basement excavation.

The basement excavation should be inspected on completion to ensure that the condition of the soil complies with that assumed in design. Should pockets of inferior material be present, they should be removed and replaced with well graded hardcore or lean mix concrete. Old foundations, concrete obstructions and buried services should be grubbed out and removed. The excavated surfaces should be protected from deterioration using a blinding layer of concrete, since the clay soils are prone to rapid deterioration if exposed to water, with resulting loss of their bearing properties. Care should therefore be exercised to ensure that neither surface water nor groundwater is allowed to collect in the base of excavations.

Water was recorded in the borehole standpipes at about 1.00m depth óperchedô within the made ground, however this may not represent the underlying groundwater level. The

water level within the standpipes does not necessarily indicate a potential for flotation, as such water would be confined within the base of the cover of made ground. It would be prudent to undertake further monitoring visits to check the standpipe water levels closer to the time of construction.

The basement structure should be constructed and ótankedô such that it is waterproofed to ensure future water tightness with regard to downward percolating water alongside the structures as well as excluding groundwater.

Potential flotation of the basement structures when empty below the groundwater table should not present a problem due to the likely weight of the structures. Providing that the basement floor is adequately tied into piled retaining walls, such flotation is unlikely to require additional precautions such as sideways keys or additional weighting.

Safety precautions should not be neglected especially where personnel are to enter excavations when close side support will be required in order to maintain excavation stability. All excavations should be undertaken in accordance with CIRIA Report 97 ó*Trenching Practice*ô.

Care should also be taken to ensure that the proposed retaining walls of the basement are not surcharged with plant and equipment or the stockpiling of materials and excavated soils outside of the basement excavation.

Piled Foundations

It is likely that piled foundations will be necessary to support the proposed multi-storey buildings. The solid geology London Clay below basement level is a suitable pile bearing stratum. The advice of a specialist piling contractor should be sought prior to design. Bored or Continuous Flight Augered (CFA) piles are likely to be best suited to these ground conditions. Vibrations from driven piles could be potentially damaging to neighbouring structures, particularly where they are supported by shallow footings underlain by potentially transmissive made ground.

For the purposes of preliminary pile design, the pile bearing coefficients given overleaf, which are based on the following assumptions, may be used to assess working loads for a bored pile.

1) Ultimate shaft adhesion within the made ground and depth of proposed basement is ignored.

2) The ultimate load on a pile would be the sum of the adhesion acting on the pile shaft together with the end bearing load.

3) The adhesion acting on the shaft of a pile is a function of the strength of the clay, taken from the SPT ôNõ values and values of apparent cohesion (Figures 1 and 2).

4) The end bearing load would be a function (9.0) of the average cohesion of the clay at the level of the pile base (Figures 1 and 2).

5) A factor of safety of at least 2.0 would be used to assess the working load and if test loading of selected piles were not practical, the factor of safety (F) would be increased to at least 2.5.

6) Where piles are installed in groups it will be necessary to position them at least 3.0 diameters apart, centre-to-centre, otherwise a reduction in individual working load will need to be taken into account.

Item	**Ultimate Pile Bearing Value kN/m^2**
Shaft friction/adhesion in made ground/depth of basement to 4.0m	Nil
Average shaft adhesion in weathered London Clay to 4.0m to 11.0m	40
Average shaft adhesion in London Clay 11.0m to 22.0m	55
Average shaft adhesion in London Clay 22.0m to 40.0m	75
End bearing in weathered London Clay 4.0m to 11.0m	720
End bearing in London Clay 11.0m to 22.0m	990
End bearing in London Clay below 22.0m	1350

Based on these coefficients it is estimated that a single 450mm diameter bored pile installed to 15m depth within the London Clay, would have a working load of 345kN (F=2.5). Similarly, the same diameter pile extended to a depth of 30m within the London Clay would have a working load of 925kN (F=2.5).

Larger diameter piles would have increased working loads. For example, the same 15m and 30m length piles at 600mm diameter would have working loads of 490kN (F=2.5) and 1270kN (F=2.5) respectively.

Different pile lengths or diameters, from those detailed above would give different available working loads, as would pile groups, which could be tailored to suit the working loads required. A piling specialist should undertake final design of piles.

Retaining Walls

The walls of the proposed basement will act as retaining walls and will need to be designed accordingly. For a permanent retaining wall analysis effective stress parameters would be appropriate, however, in the absence of effective stress testing on samples from this site, published parameters, previous experience and in-situ test results could be used as a conservative approach.

The design of retaining walls around the basement area may be based on the following stress parameters:

Soil Type	**Bulk Density (Mg/m^3)** γ_B	**Effective Shear Strength (kPa)** c'	**Angle of Shearing Resistance (degrees)** ϕ'
Made Ground	1.80	0	26
London Clay	1.95	0-2	27

The basement retaining walls and floor should be adequately ótankedô in order to seal the below ground structure from any ingress of groundwater or downward percolating water.

Drainage

The soakaway tests conducted at shallow depth in the south-eastern part of the site yielded soil infiltration rates between $3.18x10^{-4}$m/s and $5.42x10^{-5}$m/s. These results rate the made ground soils as having a 'good' drainage potential according to Figure 6 of BS8004:1986. It

should be noted that the use of soakaway drainage within non-engineered fill would not be advisable, as the ingress of large volumes of water could induce collapse compression following inundation.

Sulphate Conditions

Sulphate analysis of selected samples of soil yielded soluble sulphate concentrations within Design Sulphate Classes DS-1 to DS-4, of the BRE Special Digest 1, Table C2 (2005), presented in Appendix 1. The pH results ranged between 6.6 and 11.8, indicating acidic to alkaline conditions.

The London Clay Formation commonly contains sulphides, such as pyrite, and so following oxidation after disturbance during or following excavation, there may be an increased total potential sulphate content. There was no visual evidence of pyrite in the London Clay within the four boreholes. Whilst there is a possibility that oxidation of the London Clay could occur during exposure in excavations, there is little risk of the clay being disturbed, exposed and oxidised against foundations or sub-structure.

These results indicate an Aggressive Chemical Environment for Concrete (ACEC) Class of AC-4 for buried concrete. This ACEC Class should be considered when specifying a Design Chemical Class (DC Class) for buried concrete on this site, as detailed in the above cited BRE document.

Other Issues

The basement development beneath this site would only be considered likely to affect the drainage system of the site itself. However, drainage and sewer records for the surrounding buildings will need to be referenced, if available, or perhaps surveyed to confirm that the site does not share a communal drainage system that runs beneath the site.

As previously described, 'perched' water is present within the basal part of the made ground beneath this site at perhaps 1.00m below ground level, and this will be displaced by the large footprint of the basement.

COMMENTS ON THE SOIL CHEMICAL TEST RESULTS

The results of the laboratory chemical testing on near surface soil samples have primarily been compared to soil screening values (SSVs) produced by Land Quality Management Limited (LQM) and the Chartered Institute for Environmental Health (CIEH) presented in their document ôThe LQM/CIEH S4ULs for Human Health Risk Assessment: 2015 (Publication Number S4UL3608)ô. The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and are transparently-derived and cautious ótrigger valuesô above which further assessment of the risks or remedial action may be needed. The S4ULs (Suitable for Use Levels) have been derived, in accordance with UK legislation and Environment Agency policy, using a modified version of the Environment Agency CLEA 1.06 software.

Reference has also been given to ATRISKsoil soil screening values produced by Atkins Limited and provided under licence to Ground Engineering Limited. Atkins SSVs have been derived in line with the Environment Agency 2009 guidance using the CLEA 1.04 and 1.06 software. With the absence of a S4UL for cyanide the ATRISKsoil SSV has been used as the soil screening criteria within this report.

In 2014 the Department for Environment Food and Rural Affairs (DEFRA) published, in their document SP1010, Category 4 Screening Levels (C4SL) for several contaminants including lead. The C4SL represent screening levels below which the land could be considered suitable for a specified use and definitely not contaminated land in respect of those determinands. With the absence of S4UL for lead the C4SL has been used as the soil screening criteria within this report.

For each contaminant the adopted soil screening criteria have been calculated for the following land uses:

- Residential use with home grown produce
- Residential use without home grown produce
- Commercial and industrial usage

The intended purpose of the SSVs are as ñintervention valuesò in the regulatory framework for assessment of human health risks in relation to land use. These values are not binding standards, but are intended to inform judgements about the need for action to ensure that a new use of land does not pose any unacceptable risks to the health of the intended users.

Table 2 compares the test results for the made ground with the SSVs in relation to the specified uses. The number of test results, which exceed these values, are also provided.

Table 2: Comparison of Chemical Test Results with SSVs for Made Ground

Determinand	Number of Samples	Min Value mg/kg	Max Value mg/kg	Number of Samples Exceeding SSV for			Assessment Method	Soil Screening Value (SSV) 1.0% SOM		
				Residential with home grown produce	Residential without home grown produce	Commercial/ Industrial		Residential with home grown produce mg/kg	Residential without home grown produce mg/kg	Commercial/ Industrial mg/kg
Organic Matter	6	0.50%	11%	-	-	-	-	-	-	-
Arsenic	6	16	32	0	0	0	S4UL	37	40	640
Cadmium	6	0.12	0.46	0	0	0	S4UL	11	85	190
Chromium (III)*	6	16	39	0	0	0	S4UL	910	910	8600
Chromium (VI)	6	<0.50	<0.50	0	0	0	S4UL	6	6	33
Lead	6	30	470	2	1	0	C4SL	200	310	2330
Mercury	6	0.13	2.9	0	0	0	S4UL	11	15	320
Selenium	6	<0.20	0.87	0	0	0	S4UL	250	430	12,000
Nickel	6	20	48	0	0	0	S4UL	130	180	980
Phenols	6	<0.30	<0.30	0	0	0	S4UL	120	440	440
Benzo[a]pyrene	6	0.28	5.8	3	3	0	S4UL	0.79	1.2	15
Copper	6	27	290	0	0	0	S4UL	2400	7100	68,000
Zinc	6	45	420	0	0	0	S4UL	3700	40,000	730,000
Free Cyanide	6	<0.50	<0.50	0	0	0	ATRISK	34	34	34

Notes

*The concentration of Trivalent Chromium is assumed to be equivalent to the Total Chromium concentration. This is because most naturally occurring chromium is in the trivalent (chromic) state.

S4UL and C4SL for metals were derived using 6% SOM. These values are not sensitive to SOM and would also be applicable for 1% SOM and 2.5% SOM.

Discussion of Soil Results

The results of the laboratory analysis indicate that the made ground contains elevated concentrations of benzo[a]pyrene and lead, which exceeded the soil screening criteria for residential with home grown produce end use; and for residential without home grown produce end use, representative of the proposed mixed use development. The concentrations did not exceed the associated soil screening criteria for a commercial/industrial end use.

Levels of all remaining elements and compounds in the samples tested were within the associated soil screening values for both residential end uses and for a commercial/industrial end use.

Due to the limited number of samples tested, statistical analysis is not considered to be meaningful.

Olfactory evidence of hydrocarbon contamination was detected below 1.80m depth in BH1. A TPH concentration of 420mg/kg was recorded from a sample at 0.40m to 1.10m depth in BH1, but the concentration of total petroleum hydrocarbons (TPH) over the zone of olfactory evidence (1.80m to 2.40m) was less than 10mg/kg (laboratory detection limit). Elsewhere the TPH concentrations ranged between less than 10mg/kg and 190mg/kg.

Asbestos fibres were identified as chrysotile fibres/clumps in BH2 between 0.50m and 1.10m below ground level.

In conclusion, the near surface soils would not be considered suitable for re-use in the proposed mixed use development (residential without home grown produce and commercial) due to the presence of lead, benzo[a]pyrene and asbestos.

SOIL GAS MONITORING RESULTS

Three return visits to site in February 2019 recorded concentrations of landfill type gasses (methane, carbon dioxide and oxygen) in the standpipe installations. The results are presented to the rear of the exploratory hole records. The recorded concentrations of methane were all <0.1% by volume. The carbon dioxide levels varied between 0.2% and 0.4% by volume. The recorded oxygen concentrations within the standpipes were slightly depleted when compared to atmospheric conditions. The in-situ measurements confirmed negligible gas emission rates with a recorded flow rate of <0.1l/hr in all instances.

Assuming a 'worst case' positive flow rate of 0.1l/hr, the results give a Gas Screening Value (GSV) of 0.0004l/hr. This GSV falls within Characteristic Situation 1 as defined by BS8485:2015 ócode of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildingsô.

UPDATED CONCEPTUAL MODEL

Assessment of the potential linkage between ground contamination sources, human and environmental receptors have been assessed based on the intrusive ground investigation documented in the preceding sections of this report.

A generalised conceptual model relative to the existing site and proposed mixed new residential, retail and church development use of the site is presented in Table 3 below.

Table 3: General Conceptual Model Relative to Future Mixed Development

Receptors	Pathway	Estimated Potential for Linkage with Contaminant Sources		
		Buildings/ Drainage	Soil	Soil Gas
Human Health ï ground workers	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Moderate	Moderate	Low
Human Health ï users of completed development	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	N/A	Moderate	Very Low
Water Environment	Migration through ground into surface water or groundwater	Low	Very Low	Very Low
Flora	Vegetation on site growing on contaminated soil	N/A	Very Low	Very Low
Building Materials	Contact with contaminated soil	N/A	Very Low	Very Low

Key to Table 3 Risk	Definition
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or, there is evidence that severe harm to a designated receptor is currently happening. The risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) and remedial works may be necessary in the short term and likely over the long term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.
N/A	Not Applicable because the proposed development will remove the source.

COMMENTS ON GROUND CONTAMINATION IN RELATION TO PROPOSED DEVELOPMENT

Anticipated exposure scenarios relating to the existing site and proposed mixed development (residential without home grown produce and commercial), in the context of the conceptual model, are discussed as follows.

The proposed development is understood to comprise construction of four tower blocks with a large basement car park and small areas of soft landscaping. The basement will remove all made ground soils within its footprint.

This investigation may not have revealed the full extent of contamination on the site and appropriate professional advice should be sought if subsequent site work reveals materials that may appear to be contaminated.

Contaminated Soil

On the basis of the ground investigation, the site is underlain by between 1.60m and 3.60m of made ground. The chemical testing of samples of made ground has identified elevated concentrations of lead and benzo[a]pyrene in respect to the proposed residential without home grown produce/commercial end use. Asbestos fibres were also locally identified within the made ground soils. There is a moderate risk that the made ground soils would affect groundworkers and future end users of the site where the made ground is exposed, such as in gardens or landscaped areas.

The underlying naturally deposited soils encountered at depth beneath the site would be considered suitable for re-use within the development.

Existing Drainage

Redundant drain runs, where encountered, should be removed from beneath the site and precautions should ensure that any remaining effluent is directly disposed off-site. The

integrity of existing drainage should be checked, and if they are to be retained any damaged sections should be replaced prior to development. The latter measures should minimise any future risk to human health and the water environment.

Buildings

The existing buildings within the site may have asbestos containing materials within them. Suitable precautions, in line with current best practice, should be put in place to protect workers from the effects of asbestos material, during the redevelopment phase.

There is a very low risk of the encountered ground contamination affecting the existing and proposed structures and their foundations.

Human Health - Construction Workers

The presence of lead and benzo[a]pyrene contamination, and asbestos, within the made ground soils indicates that there is a moderate risk that a pathway could develop affecting groundworkers during the construction phase of development

No special precautions would be required during the development of the site by workers who may come into contact with the soil during groundworks, providing that standard precautions are adopted which should generally include the procedures given by the Health and Safety Executive (The Blue Book) HS(G)66.

For the protection of workers during groundworks the following is recommended:

a) Limit repeated or prolonged skin contact with soils by wearing gloves with sleeves rolled down.

b) Washing facilities should be made available to groundworkers, so as to minimise the potential for inadvertent ingestion of soil.

c) Generation of dust should be limited by damping-down.

d) Asbestos fibres were encountered within the made ground on the site (BH2). These should not be crushed, and it is recommended that the groundworks contractor visually

screens the made ground for suspected asbestos containing materials, which should be hand-picked for separate off-site disposal as special waste. Care should be taken to protect groundworkers from inhalation of dust.

e) If any soils are revealed which are different to those encountered by this ground investigation, the advice of a specialist should be sought in view of classifying the material and ascertaining its risk to groundworkers.

f) Consideration should be given to gas monitoring within deep or confined spaces to ensure safety of personnel entering them, since carbon dioxide could accumulate within any excavations, service chambers or sub-structures.

Human Health - Users of Completed Development

The risk of the identified ground contamination (lead, benzo[a]pyrene and asbestos) affecting the site users in a residential without home grown produce setting would be considered to be moderate, where a pathway is present.

The proposed basement structure will remove most, if not all of the made ground from the site.

Where present beneath buildings and permanent areas of hardstanding, the risk of the encountered ground contamination affecting the site users would be considered to be very low. This is because it would be highly unlikely that the general site users would normally be able to penetrate the building floors, which would be necessary for them to uncover any contaminated soils beneath the site.

The results of the chemical analysis would indicate that the made ground should be considered unsuitable for re-use at the surface within any new garden or landscaped areas. Within such areas scheduled for soft landscaping the made ground should be removed and replaced with a surface covering of at least 0.60m of certified ócleanô topsoil, which would be considered to provide a suitable pathway break. Any soil imported to site must be certified as "suitable for use".

The gas monitoring has determined that a Characteristic Situation 1 classification would apply and that no precautions are required to protect the proposed buildings from ingress of soil gases. No precautionary measures are required to protect the development from radon.

Water Environment

The site is covered by made ground and underlain by the solid geology London Clay, an ôUnproductiveô stratum. Groundwater was recorded óperchedô within the made ground at between 0.60m and 1.00m below ground level. The direction of groundwater flow is anticipated to be to the south-east, towards the River Brent. The risk to the water environment is considered very low as it is unlikely that the proposed development and contaminants within the made ground soils would impact the quality of the water environment.

Effects on Building Materials and Buried Services

The sulphate requirements for buried concrete have been discussed in the previous section of this report.

Consideration should be given to upgrading service materials, particularly for water supply pipes, if proposed, where they are to be in contact with made ground containing elevated concentrations of lead and benzo[a]pyrene, or ensure that the made ground is not used as a backfill around such water supply pipes. Further advice should be sought from the water supplier, regarding additional precautions for water supply pipes.

Off-Site Disposal of Soil Arisings

The results of chemical analysis provided to the rear of this report should be used for the basic characterisation of the soil destined for landfill. The Environment Agency publication Hazardous Waste, Technical Guidance WM3 outlines the methodology for classifying wastes and should be referenced for guidance. The test results (total metals, hydrocarbons and cyanide) should be compared to the relevant thresholds to determine whether they fall into the

primary categories of non-hazardous waste or hazardous waste and will help indicate the likely European Waste Catalogue (EWC) code, which is determined by the waste type. The results of Waste Acceptance Criteria (WAC) leachate testing should be used to check whether, if categorised as non-hazardous waste it could be disposed of at an inert waste landfill; or if categorised as hazardous waste whether it could qualify as stable non-reactive hazardous waste for disposal in non-hazardous landfill.

Excavated material and excess spoil should always be classified prior to removal from site as required by ôDuty of Careô (Environmental Protection Act, 1990) legislation. This means that material has to be given a proper description and waste classification prior to removal. Basic characterisation is the responsibility of the waste producer and compliance checking and on-site verification are generally the responsibility of the landfill operator. The landfill operator will need to liaise with the waste producer as the approach relies on the information from basic characterisation.

It is expected that clean arisings from foundation excavations into the natural soils across this site would also fall into the inert category under the European Waste Catalogue description ôSoil and Stonesô, EWC code 17 05 04 with restrictions excluding topsoil and peat.

CONTAMINATION ASSESSMENT CONCLUSIONS

The proposed development is understood to include mixed use tower blocks with underground car parking and areas of soft landscaping. The proposed site layout will need to be confirmed in order to clearly identify areas of new soft landscaping and communal gardens, together with areas where existing made ground is to remain.

Remediation

1. The risk of the encountered ground contamination affecting site users within a commercial/industrial development is considered to be very low and consequently no formal scheme of remediation is proposed for such areas.

2. Remediation will be required within any landscaped areas of the development, where remnant made ground soils will be exposed at the surface. This will involve the removal of made ground and replacement with a suitably thick cover or barrier layer in order to break the pathway between the underlying made ground and end users of the residential development.

3. The removal of 0.60m of made ground or a cover thickness of the same magnitude is considered prudent for communal gardens and soft landscaping.

4. Any imported topsoil and subsoil should have appropriate certificates confirming its suitability prior to placement.

5. The local authority should be informed regarding each stage of the works and photographic evidence kept, together with copied waste transfer receipts for any arisings, as they are essential to demonstrate the works.

Remediation Plan

This remediation strategy should be used with a proposed development plan to derive a remediation plan, clearly labelled to show the different land uses (hardstanding, buildings,

buildings, soft landscaped communal gardens, private gardens and landscaped areas) which should be submitted to satisfy planning conditions.

If any soils are revealed which are different to those encountered by this ground investigation, the advice of a specialist should be sought in view of classifying the material and ascertaining its risk to groundworkers and end users.

Validation

It is recommended that the work is fully documented and on completion a validation report is prepared providing a full descriptive record of the process, quantities of material excavated, stored and removed, and the materials imported and placed, together with chemical test results and photographic record.

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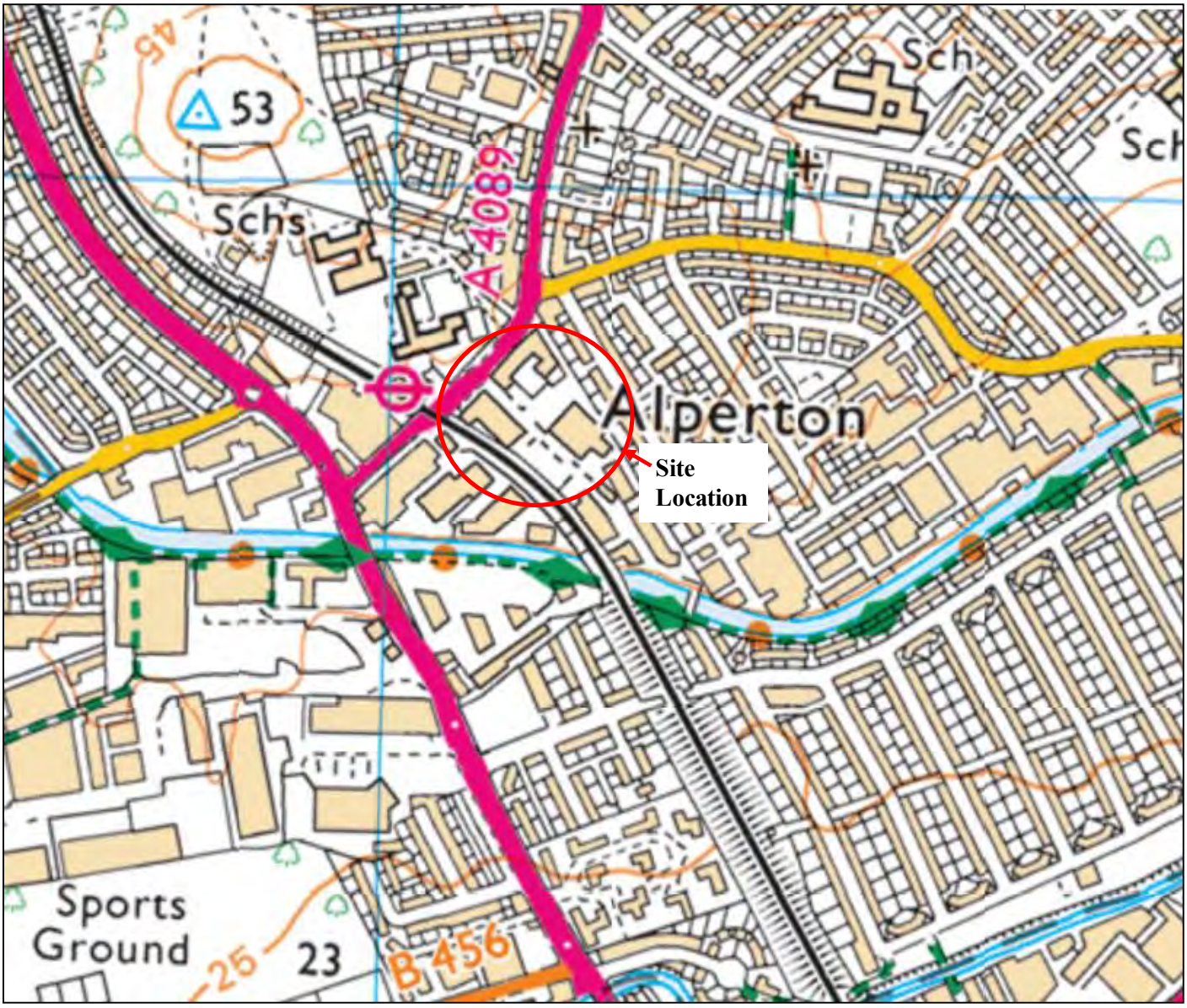
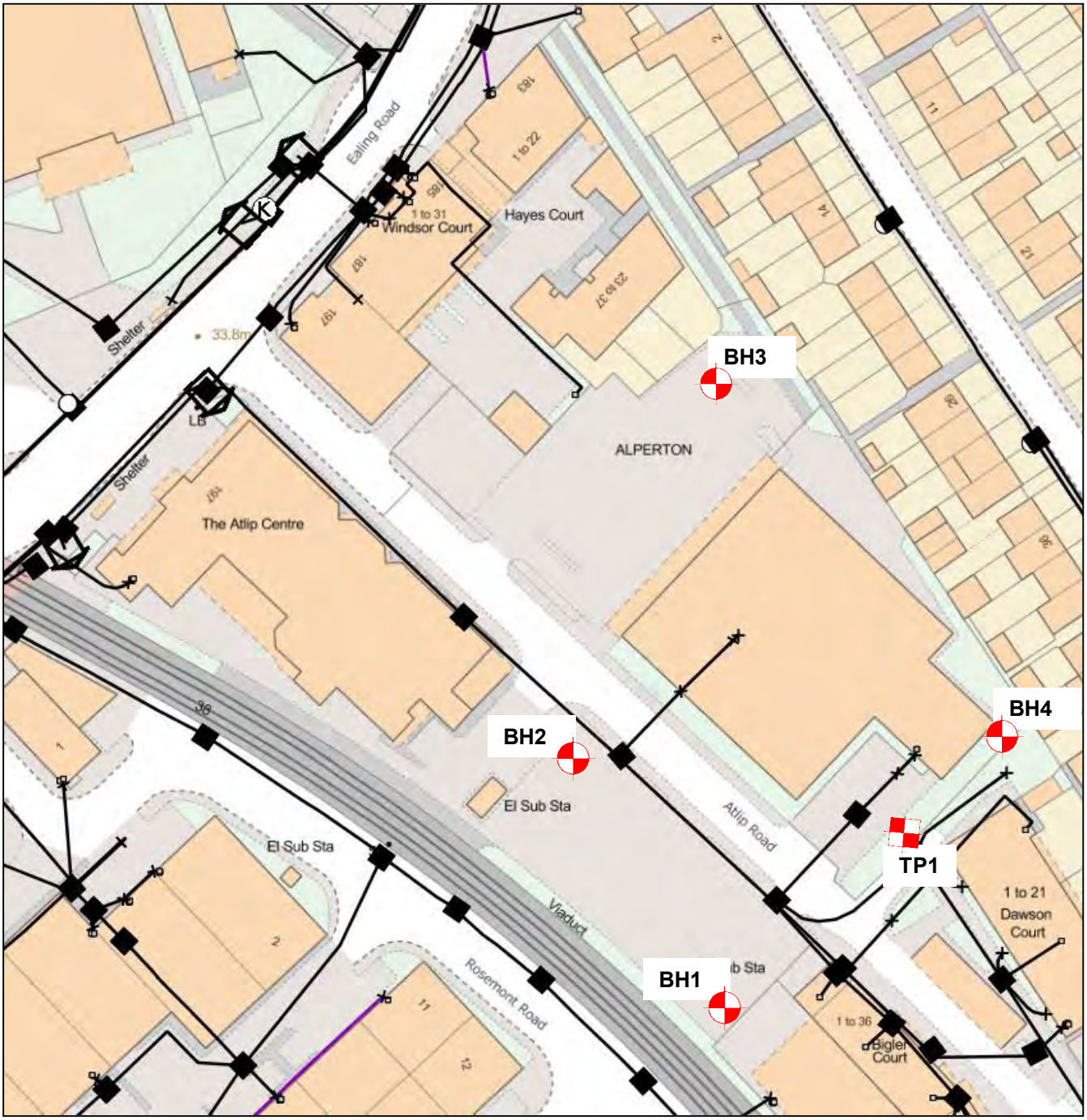
Site Location Plan



Not To Scale

Project : Land adjacent Atlip Road, Alperton, Wembley **Client : Atlip House Limited**	**GROUND ENGINEERING LIMITED** Peterborough Tel : 01733 566566	**Project No.** **C14666**

Exploratory Hole Location Plan

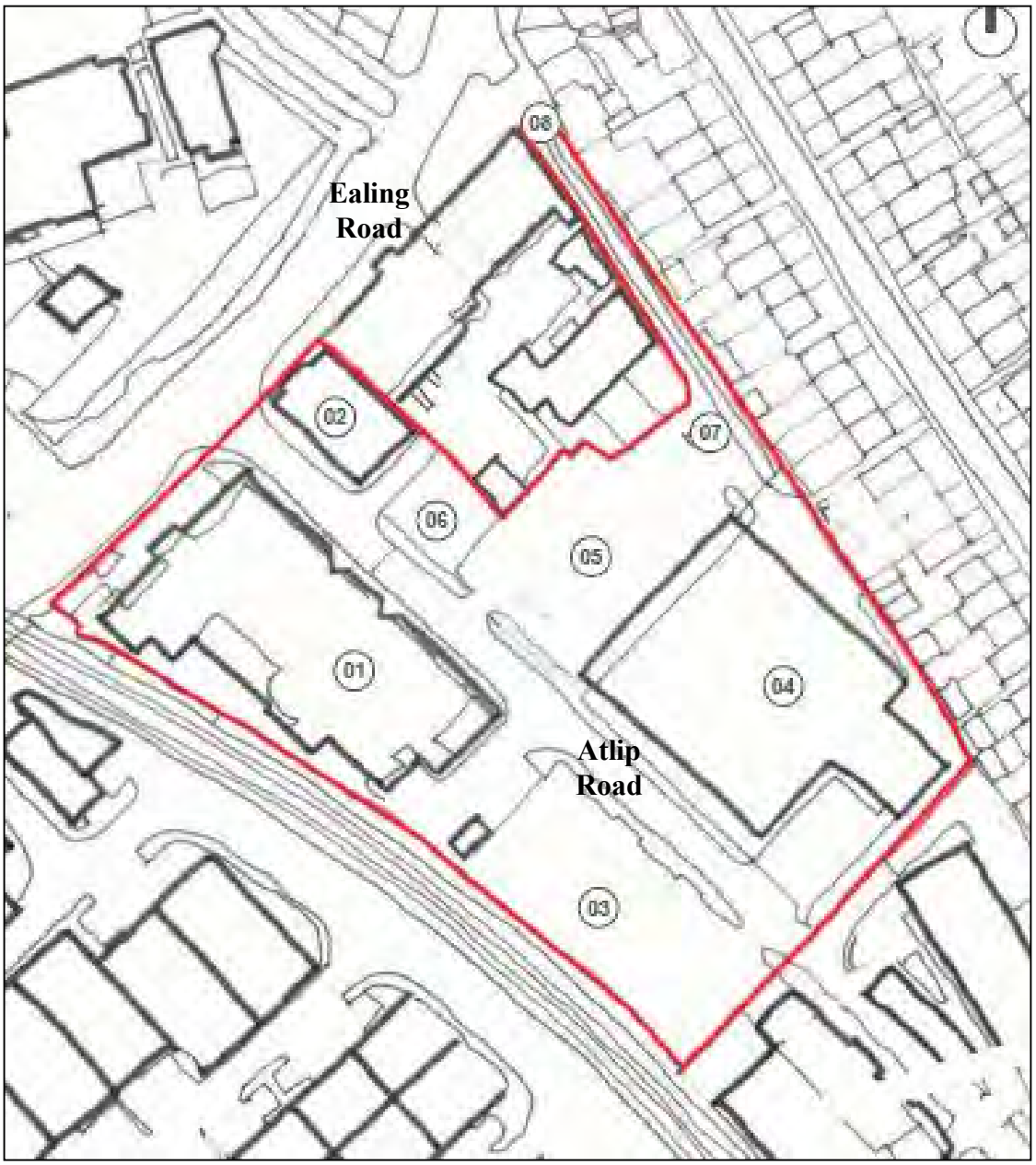


Not To Scale

Project : Land adjacent Atlip Road, Alperton, Wembley **Client : Atlip House Limited**	**GROUND ENGINEERING LIMITED** Peterborough Tel : 01733 566566	**Project No. C14666**

Site Boundary Plan

Based on plan provided by the client



Not To Scale

Project : Land adjacent Atlip Road, Alperton, Wembley **Client : Atlip House Limited**	**GROUND ENGINEERING LIMITED** Peterborough Tel : 01733 566566	**Project No. C14666**

GROUND ENGINEERING LIMITED

Tel: 01733-566566
www.groundengineering.co.uk

Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

BOREHOLE BH1

Date: 07/01/19 to 10/01/19

Hole Size: 200mm dia to 0.35m
150mm dia to 40.00m

Ground Level: 31.40m. O.D.

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows						
					MADE GROUND - BRICK paviours.		0.10	31.30
					MADE GROUND - Brown SAND.		0.15	31.25
					MADE GROUND - CONCRETE.		0.35	31.05
0.40-1.10	B1				MADE GROUND - Brown, silty SAND AND GRAVEL. Gravel of flint, brick, concrete and ceramic tile fragments.			
0.40	D1							
			SS				1.10	30.30
1.20-1.70	B2				MADE GROUND - Soft, brown, slightly sandy, slightly gravelly, silty CLAY with occasional pockets of very soft, dark grey organic clay. Gravel of flint, brick and concrete fragments. ...Becoming brown and dark grey mottled with a hydrocarbon odour below 1.80m depth.			
1.20	D2							
1.35-1.65	C	N9	1					
1.90-2.40	B3							
1.90	D3		1.50					
2.05-2.35	C	N5						
							2.80	28.60
2.90-3.40	U1	45	2.50		Firm, brown, orange brown and grey mottled, silty CLAY. (HIGHLY WEATHERED LONDON CLAY)			
3.40	D4						3.50	27.90
					Stiff, locally firm, closely fissured, brown and orange brown mottled, silty CLAY with grey stained fissures and occasional selenite crystals.			
4.00-4.50	B4							
4.00	D5							
4.15-4.45	S	N21	3.60					
5.00-5.50	U2	65	3.60					
5.50	D6							
6.00	D7							
6.50-7.00	B5							
6.50	D8							
6.65-6.95	S	N19	3.60					
				BENEATH INSTALLATION	(WEATHERED LONDON CLAY)			
7.50	D9			BENEATH INSTALLATION				
8.00-8.40	U3	70	3.60	BENEATH INSTALLATION				
8.40	D10			BENEATH INSTALLATION				
9.00	D11			BENEATH INSTALLATION			9.00	22.40
				BENEATH INSTALLATION	Stiff, closely fissured, brown, silty CLAY with orange brown stained fissures. (WEATHERED LONDON CLAY)			
9.60-10.10	B6							
9.60	D12		3.60	BENEATH INSTALLATION				
9.75-10.05	S	N27					10.00	21.40

REMARKS
1. Surface hardstanding concrete cored at 200mm diameter
2. Borehole cased to 3.60m depth 2. Excavating a pit from 0.35m to 1.20m for 0.75 hours
4. Gas monitoring standpipe installed to 7.00
5. Chiselling from 32.70m to 32.80m for 0.25 hours

Project No 14666

Scale 1:50

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KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test
Cohesion ( ) kPa
▽c Level on completion
c▽w Level casing withdrawn
▽s Standpipe Level

Groundwater Strikes

No	Depth m Struck	Rose to	Rate	Cased	Sealed
1	1.70	1.60	slow	1.50	2.50
2	32.70	32.65	slow	3.60	not

Groundwater Observations

Date	Depth m Hole	Casing	Water
07/01/19	5.50	3.60	dry
08/01/19	5.50	3.60	dry
08/01/19	20.30	3.60	dry
09/01/19	20.30	3.60	dry
09/01/19	35.50	3.60	dry

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

BOREHOLE BH1

Date: 07/01/19 to 10/01/19

Hole Size: 200mm dia to 0.35m
150mm dia to 40.00m

Ground Level: 31.40m. O.D.

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows						
				BENEATH INSTALLATION	Stiff, closely fissured, brown, silty CLAY with orange brown stained fissures and occasional selenite crystals.		10.00	21.40
10.60	D13			BENEATH INSTALLATION				
11.00-11.40	U4	70	3.60	BENEATH INSTALLATION	(WEATHERED LONDON CLAY)			
11.40	D14			BENEATH INSTALLATION			11.50	19.90
12.00	D15			BENEATH INSTALLATION	Stiff, closely fissured, grey brown CLAY with rare fossil shell fragments.			
12.50-13.00	B7			BENEATH INSTALLATION				
12.50	D16							
12.65-12.95	S	N28	3.60	BENEATH INSTALLATION				
				BENEATH INSTALLATION				
13.50	D17			BENEATH INSTALLATION				
14.00-14.50	U5	75	3.60	BENEATH INSTALLATION				
14.50	D18			BENEATH INSTALLATION				
15.00	D19			BENEATH INSTALLATION	(LONDON CLAY)			
15.50-16.00	B8			BENEATH INSTALLATION				
15.50	D20							
15.65-15.95	S	N21	3.60	BENEATH INSTALLATION				
				BENEATH INSTALLATION				
16.40	D21			BENEATH INSTALLATION				
17.00-17.30	U6	75	3.60	BENEATH INSTALLATION	...becoming very stiff, locally stiff below 17.00m depth.			
17.30	D22			BENEATH INSTALLATION				
18.00	D23			BENEATH INSTALLATION				
18.50-19.00	B9			BENEATH INSTALLATION				
18.50	D24							
18.65-18.95	S	N29	3.60	BENEATH INSTALLATION				
				BENEATH INSTALLATION				
19.50	D25			BENEATH INSTALLATION				
20.00-20.30	U7	75	3.60	BENEATH INSTALLATION			20.00	11.40

REMARKS

Project No 14666

Scale 1:50

Page 2/4

KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▽c Level on completion
c▽w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes

No	Depth m Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations

Date	Depth m Hole	Casing	Water
10/01/19	35.50	3.60	35.00
10/01/19	40.00	3.60	dry
04/02/19	7.00	1.00	1.04
11/02/19	7.00	1.00	0.98
19/02/19	7.00	1.00	1.03

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BOREHOLE BH1

Date: 07/01/19 to 10/01/19

Hole Size: 200mm dia to 0.35m
150mm dia to 40.00m

Ground Level: 31.40m. O.D.

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows						
				BENEATH INSTALLATION	Stiff, locally very stiff, closely fissured, grey brown CLAY.		20.00	11.40
20.30	D26			BENEATH INSTALLATION				
21.00	D27			BENEATH INSTALLATION				
21.40-21.90	B10			BENEATH INSTALLATION				
21.40	D28		3.60					
21.55-21.85	S	N32		BENEATH INSTALLATION				
22.50	D29			BENEATH INSTALLATION				
22.90-23.20	U8	100	3.60	BENEATH INSTALLATION				
23.20	D30			BENEATH INSTALLATION				
24.00	D31			BENEATH INSTALLATION				
24.50-24.80	U9	85	3.60	BENEATH INSTALLATION				
24.70	D32			BENEATH INSTALLATION	(LONDON CLAY)			
25.50	D33			BENEATH INSTALLATION				
26.00-26.50	B11			BENEATH INSTALLATION				
26.00	D34							
26.15-26.45	S	N60	3.60	BENEATH INSTALLATION				
27.00	D35			BENEATH INSTALLATION				
27.60-28.00	U10	80	3.60	BENEATH INSTALLATION				
28.00	D36			BENEATH INSTALLATION				
28.60	D37			BENEATH INSTALLATION				
29.00-29.50	B12			BENEATH INSTALLATION				
29.00	D38							
29.15-29.45	S	N61	3.60	BENEATH INSTALLATION				
30.00	D39			BENEATH INSTALLATION			30.00	1.40

REMARKS

Project No 14666

Scale 1:50 | Page 3/4

KEY
D - Disturbed Sample
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U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▼ Water Strike
▼ Water Rise
N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▼c Level on completion
c▼w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes					
	Depth m				
No	Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations			
	Depth m		
Date	Hole	Casing	Water

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

BOREHOLE BH1

Date: 07/01/19 to 10/01/19

Hole Size: 200mm dia to 0.35m
150mm dia to 40.00m

Ground Level: 31.40m. O.D.

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows						
				BENEATH INSTALLATION	Very stiff, locally stiff, closely fissured, grey brown CLAY.		30.00	1.40
30.50-30.80	U11	100	3.60	BENEATH INSTALLATION				
30.80	D40			BENEATH INSTALLATION				
31.50	D41			BENEATH INSTALLATION				
32.00-32.50	B13			BENEATH INSTALLATION				
32.00	D42							
32.15-32.45	S	N57	3.60	BENEATH INSTALLATION				
			2	BENEATH INSTALLATION	...with very weak mudstone layer at 32.70m depth.			
33.00	D43			BENEATH INSTALLATION				
33.40-33.70	U12	100	3.60	BENEATH INSTALLATION				
33.70	D44			BENEATH INSTALLATION	(LONDON CLAY)			
34.50	D45			BENEATH INSTALLATION				
35.00-35.50	B14			BENEATH INSTALLATION				
35.00	D46							
35.15-35.45	S	N50	3.60	BENEATH INSTALLATION				
36.00	D47			BENEATH INSTALLATION				
36.60-36.80	U13	100	3.60	BENEATH INSTALLATION				
36.80	D48			BENEATH INSTALLATION				
37.50	D49			BENEATH INSTALLATION				
38.00-38.50	B15			BENEATH INSTALLATION				
38.00	D50							
38.15-38.45	S	N67	3.60	BENEATH INSTALLATION				
39.00	D51			BENEATH INSTALLATION				
39.70-40.00	U14	100	3.60	BENEATH INSTALLATION				
40.00	D52			BENEATH INSTALLATION			40.00	-8.60

REMARKS

Borehole completed at 40.00m depth

Project No 14666

Scale 1:50

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KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/*- SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▽c Level on completion
c▽w Level casing withdrawn
▽s Standpipe Level

Groundwater Strikes						Groundwater Observations			
	Depth m						Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

BOREHOLE BH2

Date: 11/01/19 to 14/01/19

Hole Size: 200mm dia to 0.35m
150mm dia to 25.00m

Ground Level: 32.10m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
				MADE GROUND - BRICK paviours.		0.10	32.00
				MADE GROUND - Brown SAND.			
0.35	D1			MADE GROUND - CONCRETE.		0.15	31.95
0.50-1.10	B1			MADE GROUND - Dark brown, clayey SAND AND GRAVEL with occasional pockets of soft, brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of flint, coal, brick, mortar, pottery, ash and asbestos containing material fragments.		0.35	31.75
1.20-1.70	B2						
1.20	D2					1.30	30.80
1.35-1.65	S	N7		MADE GROUND - Soft, dark grey, slightly gravelly, silty CLAY. Gravel of brick and ash fragments.		1.60	30.50
1.80	D3			Firm, brown, orange brown and grey mottled, silty CLAY.			
2.10-2.40	U1	35	1.50				
2.40	D4			(HIGHLY WEATHERED LONDON CLAY)			
3.00-3.50	B3					3.00	29.10
3.00	D5			Stiff, closely fissured, brown and orange brown mottled CLAY with occasional selenite crystals.			
3.15-3.45	S	N13	1.50				
4.00-4.45	U2	50	2.70				
4.50	D6						
5.00-5.50	B4			(WEATHERED LONDON CLAY)			
5.00	D7						
5.15-5.45	S	N17	2.70				
6.00	D8						
6.50-6.95	U3	70	2.70				
7.00	D9			...with blue grey stained fissures below 7.00m depth.			
7.50	D10						
8.00-8.50	B5						
8.00	D11						
8.15-8.45	S	N23	2.70				
9.00	D12						
9.50-9.95	U4	85	2.70				
10.00	D13					10.00	22.10

REMARKS
1. Surface hardstanding concrete cored at 200mm diameter
2. Chiselling from 0.25m to 0.35m for 1 hour
3. Excavating a pit from 0.35m to 1.10m for 0.75 hours
4. Borehole cased to 2.80m depth

Project No 14666

Scale 1:50

Page 1/3

KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/*- SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▼c Level on completion
c▽w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes

No	Depth m Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations

Date	Depth m Hole	Casing	Water
11/01/19	10.00	2.70	dry
14/01/19	10.00	2.70	dry
14/01/19	25.00	2.80	dry
14/01/19	25.00	0.00	dry

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

BOREHOLE BH2

Date: 11/01/19 to 14/01/19

Hole Size: 200mm dia to 0.35m
150mm dia to 25.00m

Ground Level: 32.10m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
				Stiff, closely fissured, brown and orange brown mottled CLAY with blue grey stained fissures and occasional selenite crystals.		10.00	22.10
10.50	D14						
				(WEATHERED LONDON CLAY)			
11.10-11.60	B6						
11.10	D15		2.80				
11.25-11.55	S	N27					
12.00	D16					12.00	20.10
				Very stiff, locally stiff, closely fissured, grey brown, silty CLAY.			
12.50-12.80	U5	85	2.80				
12.80	D17						
13.50	D18						
14.10-14.60	B7						
14.10	D19		2.80				
14.25-14.55	S	N38					
15.00	D20						
15.50-15.80	U6	85	2.80				
15.80	D21						
16.50	D22						
17.00-17.50	B8			(LONDON CLAY)			
17.00	D23						
17.15-17.45	S	N36	2.80				
18.00	D24						
18.60-18.90	U7	100	2.80				
18.90	D25						
19.50	D26						
20.00-20.50	B9					20.00	12.10

REMARKS

Project No 14666

Scale 1:50 | Page 2/3

KEY
D - Disturbed Sample
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S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/*- SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▼c Level on completion
c▼w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes						Groundwater Observations			
	Depth m						Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water

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Site: LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY

BOREHOLE BH2

Date: 11/01/19 to 14/01/19

Hole Size: 200mm dia to 0.35m
150mm dia to 25.00m

Ground Level: 32.10m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
20.00	D27			Very stiff, closely fissured, grey brown CLAY.			
20.15-20.45	S	N36	2.80			20.00	12.10
21.00	D28						
21.60-21.90	U8	100	2.80				
21.90	D29						
22.50	D30						
23.00-23.50	B10			(LONDON CLAY)			
23.00	D31						
23.15-23.45	S	N50	2.80				
24.00	D32						
24.50-24.95	U9	90	2.80				
25.00	D33					25.00	7.10
				Borehole completed at 25.00m depth			

REMARKS

Project No 14666

Scale 1:50 | Page 3/3

KEY
D - Disturbed Sample
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U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▽c Level on completion
c▽w Level casing withdrawn
▽s Standpipe Level

Groundwater Strikes						Groundwater Observations			
	Depth m						Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

BOREHOLE BH3

Date: 18/01/19 to 22/01/19

Hole Size: 200mm dia to 0.25m
150mm dia to 40.00m

Ground Level: 32.60m. O.D.

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows						
					MADE GROUND - BRICK paviours.		0.10	32.50
					MADE GROUND - CONCRETE.		0.25	32.35
0.30-1.00	B1				MADE GROUND - Brown and grey, slightly silty SAND AND GRAVEL. Gravel of flint, concrete and brick fragments.			
0.30	D1		▼s					
			▼ss				1.00	31.60
1.10	D2				MADE GROUND - Soft, brown and grey mottled, slightly gravelly CLAY with occasional part decayed organic material. Gravel of flint and wood fragments.			
1.20-1.65	U1	35	1.20					
1.40	D3							
1.50-2.00	B2							
1.50	D4		1					
1.65-1.95	S	N7	▼				1.90	30.70
					Firm, brown, orange brown and grey mottled, silty CLAY.			
2.50-2.80	U2	50	1.50					
2.80	D5							
3.50-4.00	B3				(HIGHLY WEATHERED LONDON CLAY)			
3.50	D6							
3.65-3.95	S	N16	2.80					
4.50-4.90	U3	75	2.80				4.50	28.10
					Stiff, closely fissured, brown and orange brown mottled silty CLAY with grey stained fissures, occasional selenite crystals and rare orange brown silt partings.			
4.90	D7							
5.50-6.00	B4							
5.50	D8							
5.65-5.95	S	N21	2.80					
6.50	D9							
7.00-7.40	U4	80	2.80		(WEATHERED LONDON CLAY)			
				BENEATH INSTALLATION				
7.40	D10			BENEATH INSTALLATION				
8.00	D11			BENEATH INSTALLATION				
8.50-9.00	B5			BENEATH INSTALLATION			8.50	24.10
8.50	D12				Stiff, closely fissured, brown, silty CLAY with orange brown stained fissures.			
8.65-8.95	S	N24	2.80	BENEATH INSTALLATION				
9.50	D13			BENEATH INSTALLATION	(WEATHERED LONDON CLAY)			
10.00-10.30	U5	90	2.80	BENEATH INSTALLATION			10.00	22.60

REMARKS
1. Surface hardstanding concrete cored at 200mm diameter
2. Excavating a pit from 0.25m to 1.20m for 1 hour
3. Chiselling from 23.50m to 23.80m for 0.50 hours
4. Borehole cased to 2.80m depth
5. Gas monitoring standpipe installed to 7.00m depth

Project No 14666

Scale 1:50 | Page 1/4

KEY
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V - Vane Shear Test Cohesion ( ) kPa
▼c Level on completion
c▼w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes

No	Depth m Struck	Rose to	Rate	Cased	Sealed
1	1.90	1.80	medium	1.50	2.80

Groundwater Observations

Date	Depth m Hole	Casing	Water
18/01/19	15.00	2.80	dry
21/01/19	15.00	2.80	dry
21/01/19	35.50	2.80	dry
22/01/19	35.50	2.80	dry
22/01/19	40.00	2.80	dry

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

Date: 18/01/19 to 22/01/19

Hole Size: 200mm dia to 0.25m
150mm dia to 40.00m

BOREHOLE BH3

Ground Level: 32.60m. O.D.

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows						
10.30	D14			BENEATH INSTALLATION	Stiff, closely fissured, brown and grey mottled, silty CLAY with occasional selenite crystals.		10.00	22.60
10.80	D15			BENEATH INSTALLATION				
11.60-12.10	B6			BENEATH INSTALLATION	(WEATHERED LONDON CLAY)			
11.60	D16		2.80					
11.75-12.05	S	N24		BENEATH INSTALLATION				
12.50	D17			BENEATH INSTALLATION				
				BENEATH INSTALLATION	Stiff, closely fissured, grey brown CLAY.		12.50	20.10
13.00-13.20	U6	80	2.80	BENEATH INSTALLATION				
13.20	D18			BENEATH INSTALLATION				
14.00	D19			BENEATH INSTALLATION				
14.50-15.00	B7			BENEATH INSTALLATION				
14.50	D20							
14.65-14.95	S	N26	2.80	BENEATH INSTALLATION	(LONDON CLAY)			
15.50	D21			BENEATH INSTALLATION				
16.10-16.50	U7	100	2.80	BENEATH INSTALLATION				
16.50	D22			BENEATH INSTALLATION				
17.00-17.60	B8			BENEATH INSTALLATION				
17.00	D23							
17.60	D24			BENEATH INSTALLATION				
17.75-18.05	S	N31	2.80	BENEATH INSTALLATION	...Becoming very stiff below 17.75m depth.			
18.50	D25			BENEATH INSTALLATION				
19.00-19.20	U8	100	2.80	BENEATH INSTALLATION				
19.20	D26			BENEATH INSTALLATION				
20.00	D27			BENEATH INSTALLATION			20.00	12.60

REMARKS

Project No 14666

Scale 1:50 | Page 2/4

KEY
D - Disturbed Sample
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▽ Water Strike
▼ Water Rise
N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▼c Level on completion
c▼w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes

No	Depth m Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations

Date	Depth m Hole	Casing	Water
22/01/19	40.00	0.00	dry
22/01/19	7.00	1.00	dry
04/02/19	7.00	1.00	0.62
11/02/19	7.00	1.00	0.91
19/02/19	7.00	1.00	0.99

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

Date: 18/01/19 to 22/01/19

Hole Size: 200mm dia to 0.25m
150mm dia to 40.00m

BOREHOLE BH3

Ground Level: 32.60m. O.D.

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows						
				BENEATH INSTALLATION	Very stiff, closely fissured, grey brown CLAY.		20.00	12.60
20.50-21.00	B9			BENEATH INSTALLATION				
20.50	D28							
20.65-20.95	S	N36	2.80					
				BENEATH INSTALLATION				
21.50	D29			BENEATH INSTALLATION				
22.00-22.30	U9	90	2.80	BENEATH INSTALLATION				
22.50	D30			BENEATH INSTALLATION				
23.00	D31			BENEATH INSTALLATION				
				BENEATH INSTALLATION				
23.50-24.00	B10			BENEATH INSTALLATION	...with very weak mudstone layer at 23.50m depth.			
23.50	D32							
23.65-23.93	C	N58	2.80					
				BENEATH INSTALLATION				
24.50	D33			BENEATH INSTALLATION				
25.00-25.20	U10	100	2.80	BENEATH INSTALLATION	(LONDON CLAY)			
25.20	D34			BENEATH INSTALLATION				
				BENEATH INSTALLATION				
26.00	D35			BENEATH INSTALLATION				
26.60-27.10	B11			BENEATH INSTALLATION				
26.60	D36		2.80					
26.75-27.05	S	N48						
				BENEATH INSTALLATION				
27.50	D37			BENEATH INSTALLATION				
28.00-28.20	U11	100	2.80	BENEATH INSTALLATION				
28.20	D38			BENEATH INSTALLATION				
				BENEATH INSTALLATION				
29.00	D39			BENEATH INSTALLATION				
29.50-30.00	B12			BENEATH INSTALLATION				
29.50	D40							
29.65-29.95	S	N55	2.80				30.00	2.60

REMARKS

Project No 14666

Scale 1:50 | Page 3/4

KEY
D - Disturbed Sample
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S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▽c Level on completion
c▽w Level casing withdrawn
▽s Standpipe Level

Groundwater Strikes					
	Depth m				
No	Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations			
	Depth m		
Date	Hole	Casing	Water

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

BOREHOLE BH3

Date: 18/01/19 to 22/01/19

Hole Size: 200mm dia to 0.25m
150mm dia to 40.00m

Ground Level: 32.60m. O.D.

Samples and in-situ Tests			(Date) Casing	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows						
				BENEATH INSTALLATION	Very stiff, closely fissured, grey brown, silty CLAY.		30.00	2.60
30.50	D41			BENEATH INSTALLATION				
31.00-31.20	U12	100	2.80	BENEATH INSTALLATION				
31.20	D42							
32.00	D43			BENEATH INSTALLATION				
32.40-32.90	B13			BENEATH INSTALLATION				
32.40	D44			BENEATH INSTALLATION				
33.05-33.35	S	N62	2.80	BENEATH INSTALLATION				
33.50	D45			BENEATH INSTALLATION				
34.10-34.50	U13	100	2.80	BENEATH INSTALLATION				
34.50	D46			BENEATH INSTALLATION				
35.00	D47			BENEATH INSTALLATION	(LONDON CLAY)			
35.50-36.00	B14			BENEATH INSTALLATION				
35.65-35.95	S	N66	2.80	BENEATH INSTALLATION				
37.00-37.20	U14	100	2.80	BENEATH INSTALLATION				
38.00	D48			BENEATH INSTALLATION				
38.80	D49			BENEATH INSTALLATION				
39.50	D50			BENEATH INSTALLATION				
39.65-39.95	S	N62	2.80	BENEATH INSTALLATION			40.00	-7.40

REMARKS: Borehole completed at 40.00m depth

Project No 14666

Scale 1:50 | Page 4/4

KEY
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B - Bulk Sample
U - Undisturbed Sample
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S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▽c Level on completion
c▽w Level casing withdrawn
▽s Standpipe Level

Groundwater Strikes					
	Depth m				
No	Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations			
	Depth m		
Date	Hole	Casing	Water

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

BOREHOLE BH4

Date: 15/01/19 to 17/01/19

Hole Size: 150mm dia to 25.00m

Ground Level: 31.75m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
0.50-1.10	B1			MADE GROUND - Brown, silty, SAND AND GRAVEL with occasional cobbles/boulders of concrete. Gravel of flint, brick, concrete, granite, plastic and metal fragments.			
0.50	D1						
1.20-1.70	B2						
1.20	D2						
1.35-1.65	C	N29					
2.00-2.50	B3						
2.00	D3						
2.15-2.45	C	N28	1.90				
			1 ▼	...Becoming clayey from 2.90m depth.			
2.90-3.40	B4						
2.90	D4		2.80				
3.05-3.35	C	N42					
3.60	D5					3.60	28.15
3.70-4.00	U1	45	3.60	Stiff, brown, orange brown and grey mottled, silty CLAY. (HIGHLY WEATHERED LONDON CLAY)			
4.00	D6					4.00	27.75
				Stiff, locally firm, closely fissured, brown and orange brown mottled, silty CLAY with grey stained fissures, occasional selenite crystals and rare orange brown silt partings.			
4.60-5.10	B5						
4.60	D7		4.20				
4.75-5.05	S	N19					
5.60-5.90	U2	70	4.20				
5.90	D8						
6.50	D9						
7.00-7.50	B6						
7.00	D10						
7.15-7.45	S	N20	4.20				
8.00	D11			(WEATHERED LONDON CLAY)			
8.40-8.65	U3	75	4.20				
8.90	D12						
9.50	D13						
10.00-10.50	B7					10.00	21.75

REMARKS
1. Excavating a pit from 0.00m to 1.20m for 1 hour
2. Chiselling from 2.80m to 3.40m for 1 hour
3. Borehole cased to 4.20m depth

Project No 14666

Scale 1:50 | Page 1/3

KEY
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▽ Water Strike
▼ Water Rise
N/*- SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▽c Level on completion
c▽w Level casing withdrawn
▽s Standpipe Level

Groundwater Strikes

No	Depth m Struck	Rose to	Rate	Cased	Sealed
1	3.00	2.90	slow	2.80	3.60

Groundwater Observations

Date	Depth m Hole	Casing	Water
15/01/19	15.00	4.20	dry
17/01/19	15.00	4.20	dry
17/01/19	25.00	4.20	dry
17/01/19	25.00	0.00	dry

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

BOREHOLE **BH4**

Date: 15/01/19 to 17/01/19

Hole Size: 150mm dia to 25.00m

Ground Level: 31.75m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
10.00	D14			Stiff, closely fissured, brown, silty CLAY with orange			
10.15-10.45	S	N22	4.20	brown stained fissures and occasional selenite crystals.		10.00	21.75
11.00	D15			(WEATHERED LONDON CLAY)			
11.50-11.95	U4	75	4.20			11.50	20.25
				Stiff, closely fissured, grey brown CLAY.			
12.00	D16						
12.50	D17						
13.00-13.50	B8						
13.00	D18						
13.15-13.45	S	N24	4.20				
14.00	D19						
14.50-14.95	U5	85	4.20				
15.00	D20			(LONDON CLAY)			
15.50	D21						
16.00-16.45	U6	80	4.20				
16.50	D22						
17.00	D23						
17.60-18.10	B9					17.60	14.15
17.60	D24		4.20	Stiff, closely fissured, grey brown, silty CLAY.			
17.75-18.05	S	N22					
18.60	D25						
19.00-19.30	U7	80	4.20	(LONDON CLAY)			
19.30	D26						
20.00	D27					20.00	11.75

REMARKS

Project No 14666

Scale 1:50 | Page 2/3

KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/* - SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▼c Level on completion
c▼w Level casing withdrawn
▼s Standpipe Level

Groundwater Strikes						Groundwater Observations			
	Depth m						Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

Date: 15/01/19 to 17/01/19

Hole Size: 150mm dia to 25.00m

BOREHOLE BH4

Ground Level: 31.75m. O.D.

Samples and in-situ Tests			(Date) Casing	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Blows					
				Very stiff, locally stiff, closely fissured, grey brown, silty CLAY.		20.00	11.75
20.60-21.10	B10						
20.60	D28		4.20				
20.75-21.05	S	N35					
21.60	D29						
22.00-22.20	U8	100	4.20				
22.20	D30						
23.00	D31			(LONDON CLAY)			
23.50-24.00	B11						
23.50	D32						
23.65-23.95	S	N37	4.20				
24.70-25.00	U9	100	4.20				
25.00	D33					25.00	6.75
				Borehole completed at 25.00m depth			

REMARKS

Project No 14666

Scale 1:50 | Page 3/3

KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ Water Strike
▼ Water Rise
N/*- SPT Blows for 0.3m or given penetration
ES - Environmental Sample
V - Vane Shear Test Cohesion ( ) kPa
▽c Level on completion
c▽w Level casing withdrawn
▽s Standpipe Level

Groundwater Strikes					
	Depth m				
No	Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations			
	Depth m		
Date	Hole	Casing	Water

Borehole Number	Depth (m)	Casing Depth (m)	Depth to Water (m)	Type of Test *	Seating Drive Blows/ Penetration (mm)	Test Drive: 300mm Blows for each successive 75 mm Penetration				N Value	Extra-polated Value
BH1	1.20 - 1.65			C	2/150	2	2	2	3	9	
	1.90 - 2.35	1.50		C	2/150	1	1	1	2	5	
	4.00 - 4.45	3.60		S	4/150	5	5	5	6	21	
	6.50 - 6.95	3.60		S	4/150	5	4	5	5	19	
	9.60 - 10.05	3.60		S	7/150	7	6	6	8	27	
	12.50 - 12.95	3.60		S	7/150	7	7	7	7	28	
	15.50 - 15.95	3.60		S	6/150	4	5	6	6	21	
	18.50 - 18.95	3.60		S	7/150	6	7	8	8	29	
	21.40 - 21.85	3.60		S	7/150	7	7	9	9	32	
	26.00 - 26.45	3.60		S	12/150	12	15	15	18	60	
	29.00 - 29.45	3.60		S	13/150	10	15	16	20	61	
	32.00 - 32.45	3.60		S	10/150	13	15	14	15	57	
	35.00 - 35.45	3.60		S	6/150	10	10	15	15	50	
	38.00 - 38.45	3.60		S	11/150	145	15	17	20	197	
BH2	1.20 - 1.65			S	2/150	2	1	2	2	7	
	3.00 - 3.45	1.50		S	3/150	3	4	3	3	13	
	5.00 - 5.45	2.70		S	3/150	4	4	4	5	17	
	8.00 - 8.45	2.70		S	5/150	5	5	5	8	23	
	11.10 - 11.55	2.80		S	6/150	6	6	6	9	27	
	14.10 - 14.55	2.80		S	10/150	10	8	10	10	38	
	17.00 - 17.45	2.80		S	8/150	8	8	10	10	36	
	20.00 - 20.45	2.80		S	7/150	7	10	9	10	36	
	23.00 - 23.45	2.80		S	10/150	11	11	13	15	50	
BH3	1.50 - 1.95			S	2/150	1	2	2	2	7	
	3.50 - 3.95	2.80		S	4/150	4	4	4	4	16	
	5.50 - 5.95	2.80		S	5/150	5	6	5	5	21	
	8.50 - 8.95	2.80		S	6/150	5	6	6	7	24	
	11.60 - 12.05	2.80		S	5/150	6	6	6	6	24	
	14.50 - 14.95	2.80		S	5/150	6	6	6	8	26	
	17.60 - 18.05	2.80		S	7/150	7	7	7	10	31	
	20.50 - 20.95	2.80		S	7/150	7	9	9	11	36	
	23.50 - 23.93	2.80		C	10/150	20	25/50	25	13		91
	26.60 - 27.05	2.80		S	10/150	10	10	13	15	48	
	29.50 - 29.95	2.80		S	11/150	12	13	15	15	55	
	32.90 - 33.35	2.80		S	10/150	13	13	16	20	62	
	35.50 - 35.95	2.80		S	10/150	11	15	20	20	66	
	39.50 - 39.95	2.80		S	12/150	12	15	15	20	62	
BH4	1.20 - 1.65			C	10/150	7	5	7	10	29	
	2.00 - 2.45	1.90		C	7/150	5	5	11	7	28	
	2.90 - 3.35	2.80		C	4/150	10	15	13	4	42	
	4.60 - 5.05	4.20		S	4/150	4	5	5	5	19	
	7.00 - 7.45	4.20		S	5/150	5	5	5	5	20	
	10.00 - 10.45	4.20		S	5/150	5	5	6	6	22	
	13.00 - 13.45	4.20		S	5/150	5	6	6	7	24	
	17.60 - 18.05	4.20		S	5/150	5	5	6	6	22	
	20.60 - 21.05	4.20		S	6/150	7	9	9	10	35	
	23.50 - 23.95	4.20		S	9/150	8	9	10	10	37	

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* C denotes test using a solid cone
S denotes test using a split barrel sampler

Results of Standard/Cone Penetration Tests

14666

LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY

Table No

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Site: **LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY**

TRIAL PIT TP1

Date: 17/01/19

Pit Size: 1.00m L x 0.30m W x 1.00m D.

Ground Level: 31.30m. O.D.

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.10	D1			MADE GROUND - Brown and dark grey, silty, sandy GRAVEL. Gravel of flint, brick, concrete and asphalt fragments.			
0.20-0.40	B1						
0.40	D2						
						0.50	30.80
0.60-0.90	B2			MADE GROUND - Stiff, brown and dark brown mottled, slightly gravelly, silty CLAY. Gravel of flint, brick and concrete fragments.			
0.70	D3						
0.70	D3A						
1.00	D4						
1.00	D4A					1.00	30.30
				Pit completed at 1.00m depth			

KEY

- D - Disturbed Sample
- B - Bulk Sample
- U - Undisturbed Sample
- R - Root Sample
- W - Water Sample
- ES - Environmental Sample
- ▽ Water Strike
- ▼ Water Rise
- ▼c Level on completion
- MP - Mackintosh Probe
- P( ) - Hand Penetrometer Cohesion ( ) kPa
- V - Vane Shear Test Cohesion ( ) kPa

REMARKS

1. Buried brickwork met in western half of pit below 0.50m depth
2. Live roots observed to 0.50m depth
3. Pit sides stable
4. Pit dry

Project No	
14666	
Scale	Page
1:25	1/1

SOAKAWAY TEST RESULTS

BRE DIGEST 365 - SOIL INFILTRATION RATE

Project: Land adjacent Atlip Road, Alperton, Wembley
Client: Atlip House Ltd

Project No: C14666
Sheet No: 1\3

Trial Pit: TP1
Depth: 1.00
Length: 1.00
Width: 0.30

FIRST FILLING

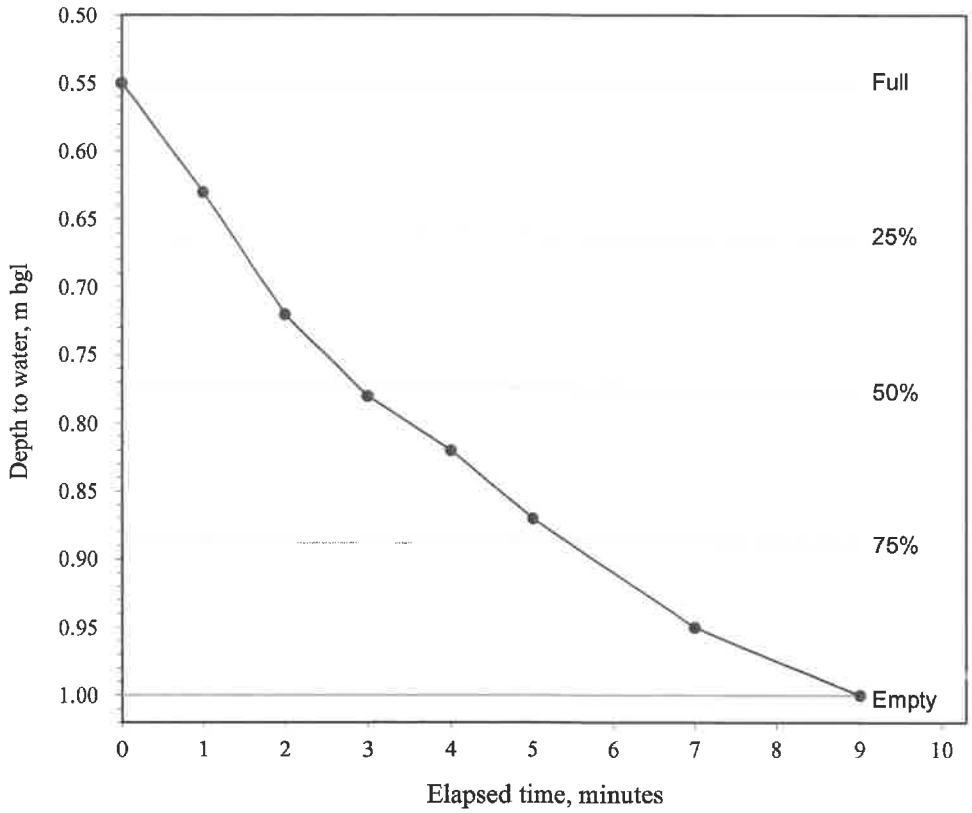
Description of Stratum under test: Stiff, brown and dark brown mottled, slightly sandy, slightly gravelly, silty clay fill and buried brick wall.

Depth to water prior to test: (below ground level) Dry

Elapsed Time min	Depth to Water m
0	0.55
1	0.63
2	0.72
3	0.78
4	0.82
5	0.87
7	0.95
9	1.00

All dimensions given in metres

DEPTH TO WATER vs ELAPSED TIME



f = (V75-V25)/A50(T75-T25)

V75-V25 = 0.068

A50 = 0.885

T75-T25 = 4

Soil Infiltration Rate f = **3.18E-04** m/s

SOAKAWAY TEST RESULTS

BRE DIGEST 365 - SOIL INFILTRATION RATE

Project: Land adjacent Atlip Road, Alperton, Wembley
Client: Atlip House Ltd

Project No: C14666
Sheet No: 2\3

Trial Pit: TP1
Depth: 1.00
Length: 1.00
Width: 0.30

SECOND FILLING

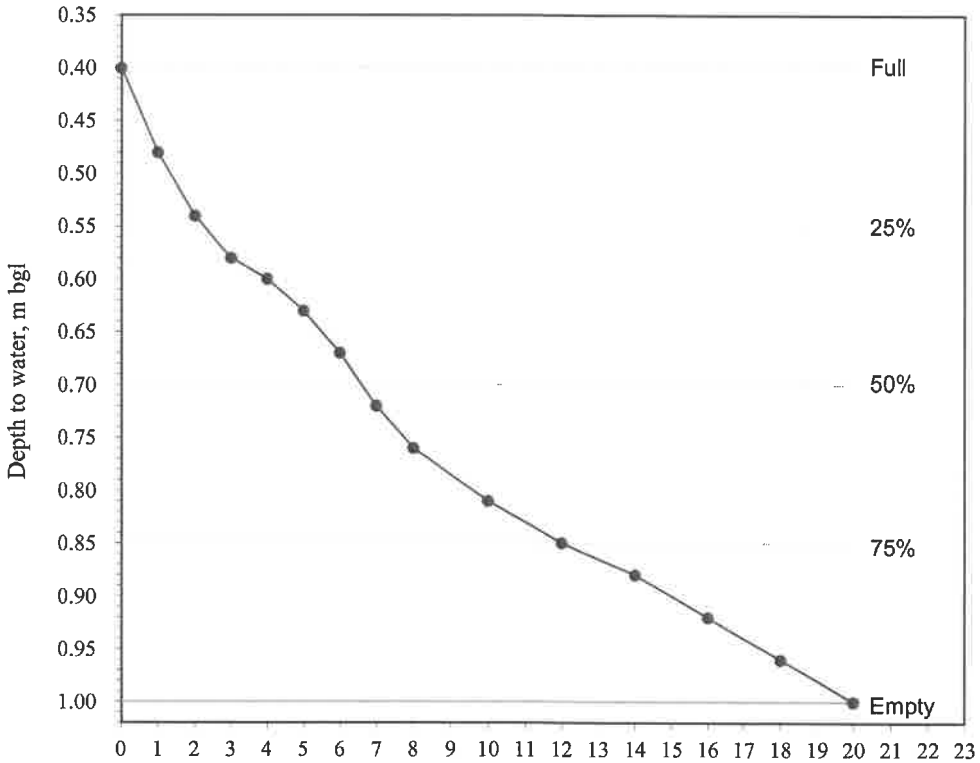
Description of Stratum under test: Stiff, brown and dark brown mottled, slightly sandy, slightly gravelly, silty clay fill and buried brick wall.

Depth to water prior to test: (below ground level) Dry

Elapsed Time min	Depth to Water m
0	0.40
1	0.48
2	0.54
3	0.58
4	0.60
5	0.63
6	0.67
7	0.72
8	0.76
10	0.81
12	0.85
14	0.88
16	0.92
18	0.96
20	1.00

All dimensions given in metres

DEPTH TO WATER vs ELAPSED TIME



f = (V75-V25)/A50(T75-T25)

V75-V25 = 0.090
A50 = 1.080
T75-T25 = 10.5

Soil Infiltration Rate **f = 1.32E-04 m/s**

SOAKAWAY TEST RESULTS

BRE DIGEST 365 - SOIL INFILTRATION RATE

Project: Land adjacent Atlip Road, Alperton, Wembley
Client: Atlip House Ltd

Project No: C14666
Sheet No: 3\3

Trial Pit: TP1
Depth: 1.00
Length: 1.00
Width: 0.30

THIRD FILLING

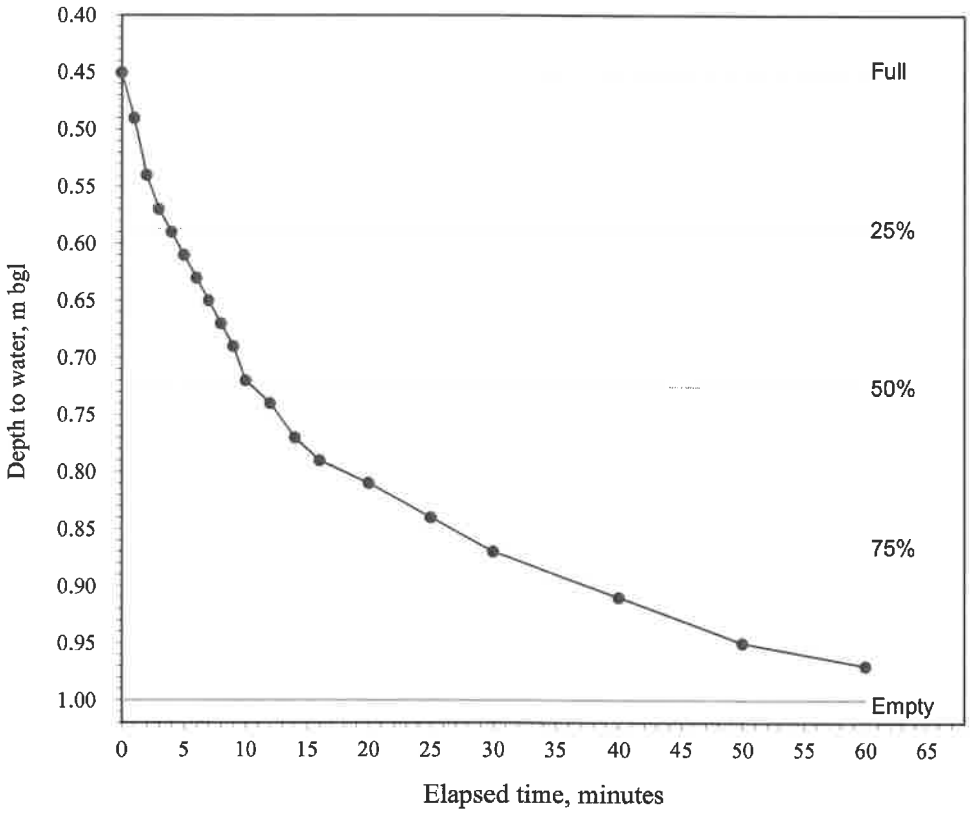
Description of Stratum under test: Stiff, brown and dark brown mottled, slightly sandy, slightly gravelly, silty clay fill and buried brick wall.

Depth to water prior to test: (below ground level) Dry

Elapsed Time min	Depth to Water m
0	0.45
1	0.49
2	0.54
3	0.57
4	0.59
5	0.61
6	0.63
7	0.65
8	0.67
9	0.69
10	0.72
12	0.74
14	0.77
16	0.79
20	0.81
25	0.84
30	0.87
40	0.91
50	0.95
60	0.97

All dimensions given in metres

DEPTH TO WATER vs ELAPSED TIME



f = (V75-V25)/A50(T75-T25)

V75-V25 = 0.083

A50 = 1.015

T75-T25 = 25

Soil Infiltration Rate f = **5.42E-05** m/s

Groundwater/Gas Monitoring Record

Site: Land adj. Atlip Road, Alperton, Wembley

Report Ref: C14666

Date	Borehole No.	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Flow Rate (l/hr)	Atmosph. Pressure (mb)	Dp (mb)	Depth of Well (mbgl)	Depth to Ground Water (mbgl)	Comments
		Peak	Steady	Peak	Steady	Min.	Max.						
04/02/19	BH1	<0.1	<0.1	0.2	0.2	19.4	19.4	<0.1	1014	<1	7.00	1.04	Groundwater sample taken in plastic bottle, glass bottle and vial.
04/02/19	BH3	<0.1	<0.1	0.2	0.2	19.0	19.0	<0.1	1014	<1	7.00	0.62	Groundwater sample taken in plastic bottle, glass bottle and vial.
11/02/19	BH1	<0.1	<0.1	0.2	0.2	20.5	20.5	<0.1	1020	<1	7.00	0.98	
11/02/19	BH3	<0.1	<0.1	0.3	0.3	20.6	20.6	<0.1	1020	<1	7.00	0.91	
19/02/19	BH1	<0.1	<0.1	0.2	0.2	20.1	20.1	<0.1	1016	<1	7.00	1.03	
19/02/19	BH3	<0.1	<0.1	0.4	0.4	19.9	19.9	<0.1	1016	<1	7.00	0.99	

LABORATORY TEST RESULTS

CONTRACT LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO_4)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m^3	Dry Mg/m^3	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil: Total % Dry Wt.	Soil: Aqueous Extract mg/l	Water mg/l	pH	
BH1	U1	2.90 - 3.40				31	1.92	1.47	Q	80	60	40	0					
	B4	4.00 - 4.50	70	24	46	29									3173		7.3	SOIL CLASSIFICATION = CH/CV 0% retained on 425μm sieve
	U2	5.00 - 5.50				31	1.97	1.50	Q	142	100	71	0					
	B5	6.50 - 7.00													2332		7.3	
	U3	8.00 - 8.40				29	1.93	1.49	Q	212	160	106	0					
	U4	11.00 - 11.40				30	1.97	1.52	Q	281	220	141	0					
	B7	12.50 - 13.00													1700		6.6	
	U5	14.00 - 14.50				31	2.03	1.55	Q	179	280	90	0					
	U6	17.00 - 17.50				29	1.95	1.51	Q	382	340	191	0					
	U7	20.00 - 20.30				28	2.01	1.58	Q	252	400	126	0					

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO_4)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m^3	Dry Mg/m^3	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil Total % Dry Wt.	Soil Aqueous Extract mg/l	Water mg/l	pH	
BH1	U9	24.50 - 24.80				27	2.02	1.58	Q	312	490	156	0					
	B11	26.00 - 26.50													1815		6.9	
	U10	27.60 - 28.00				28	1.90	1.49	Q	170	550	85	0					
	U11	30.50 - 30.80				24	1.97	1.59	Q	316	610	158	0					
	U12	33.40 - 33.70				24	1.82	1.46	Q	260	670	130	0					
	U14	39.70 - 40.00				26	1.85	1.46	Q	274	800	137	0					
BH2	B2	1.20 - 1.70	69	23	46	36									1660		6.9	SOIL CLASSIFICATION = CH 2% retained on 425μm sieve
	U1	2.10 - 2.40				32	1.89	1.43	Q	81	50	41	0					
	U2	4.00 - 4.45				29	1.99	1.54	Q	163	80	81	0					
	U3	6.50 - 6.95				30	1.98	1.53	Q	167	130	83	0					

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Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO_4)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m^3	Dry Mg/m^3	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil: Total % Dry Wt.	Soil: Aqueous Extract mg/l	Water mg/l	pH	
BH2	B5	8.00 - 8.50	70	24	46	28									3357		6.8	SOIL CLASSIFICATION = CH/CV 1% retained on 425μm sieve
	U4	9.50 - 9.95				28	1.98	1.55	Q	245	190	123	0					
	U5	12.50 - 12.80				28	2.00	1.56	Q	324	250	162	0					
	U6	15.50 - 15.80				26	1.97	1.57	Q	455	310	227	0					
	U7	18.60 - 18.90				30	1.77	1.36	Q	275	370	137	0					
	U8	21.60 - 21.90				26	1.96	1.56	Q	344	430	172	0					
	B10	23.00 - 23.50													1383		7.2	
	U9	24.50 - 24.95				25	2.05	1.65	Q	350	490	175	0					
BH3	U2	2.50 - 2.80	81	27	54	32	1.94	1.46	Q	130	50	65	0					SOIL CLASSIFICATION = CV 0% retained on 425μm sieve
	U3	4.50 - 4.90				30	1.96	1.50	Q	204	90	102	0					

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Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO_4)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m^3	Dry Mg/m^3	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil: Total % Dry Wt.	Soil: Aqueous Extract mg/l	Water mg/l	pH	
BH3	U4	7.00 - 7.40				29	1.98	1.53	Q	256	140	128	0					
	U5	10.00 - 10.30				28	1.99	1.56	Q	165	200	82	0					
	B6	11.60 - 12.10	71	25	46	28									1973		7.2	SOIL CLASSIFICATION = CV 0% retained on 425μm sieve
	U6	13.00 - 13.20				31	1.98	1.51	Q	208	260	104	0					
	U7	16.10 - 16.50				28	2.00	1.56	Q	244	320	122	0					
	U8	19.00 - 19.20				25	1.98	1.59	Q	446	380	223	0					
	U9	22.00 - 22.30				26	1.97	1.56	Q	328	440	164	0					
	U10	25.00 - 25.20				26	1.99	1.58	Q	303	500	152	0					
	U11	28.00 - 28.20				27	1.98	1.56	Q	399	560	200	0					
	U12	31.00 - 31.20				26	1.92	1.52	Q	740	620	370	0					

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C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

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LABORATORY TEST RESULTS

CONTRACT LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO_4)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m^3	Dry Mg/m^3	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil		Water	pH	
														Total % Dry Wt.	Aqueous Extract mg/l	mg/l		
BH3	B13	32.40 - 32.90													1425		7.2	
	U13	34.10 - 34.50				24	2.03	1.63	Q	313	680	157	0					
	U14	37.00 - 37.20				23	2.03	1.66	Q	871	740	435	0					
	U15	38.60 - 38.80				25	1.99	1.60	Q	845	770	423	0					
BH4	U1	3.70 - 4.00	80	26	54	33	1.89	1.42	Q	168	70	84	0					SOIL CLASSIFICATION = CV 0% retained on 425μm sieve
	B5	4.60 - 5.10													2177		7.4	
	U2	5.60 - 5.90				31	1.93	1.47	Q	110	110	55	0					
	U3	8.40 - 8.65				29	1.98	1.54	Q	238	170	119	0					
	U4	11.50 - 11.95				29	1.98	1.54	Q	217	230	109	0					
	U5	14.50 - 14.95				29	1.99	1.54	Q	284	290	142	0					

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

14666

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LABORATORY TEST RESULTS

CONTRACT LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY

Borehole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO_4)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m^3	Dry Mg/m^3	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil: Total % Dry Wt.	Soil: Aqueous Extract mg/l	Water mg/l	pH	
BH4	U6	16.00 - 16.45				29	1.99	1.54	Q	177	320	89	0					
	B9	17.60 - 18.10													1235		6.6	
	U7	19.00 - 19.30				30	2.00	1.54	Q	187	380	94	0					
	U8	22.00 - 22.20				26	1.98	1.57	Q	322	440	161	0					
	U9	24.70 - 25.00				27	2.03	1.60	Q	265	500	133	0					

U - UNDISTURBED SAMPLE
D - DISTURBED SAMPLE
B - BULK SAMPLE
W - WATER SAMPLE

C.U. - CONSOLIDATED UNDRAINED
C.D. - CONSOLIDATED DRAINED
Q. - IMMEDIATE UNDRAINED
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Aqueous Extract 2:1 Water:Soil

14666

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GROUND ENGINEERING

Newark Road Peterborough

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TEST CERTIFICATE

One-Dimensional Consolidation Properties

(Tested in accordance with BS1377 : Part 5 1990)

Client:	Ground Engineering Ltd	Certificate Number:	PL6570-1-1/731
Client Address:	Newark Road	Client Reference Number:	C14666
	Peterborough	Date Sampled:	Unknown
	Cambridgeshire	Date Received:	06.02.2019
Postcode:	PE1 5UA	Date Tested:	21.02.2019
Contact:	Simon Weatherley	Sampling Certificate No:	N/A
Site Name:	Land adj Atlip Road	Certificate of Sampling:	N/A
Site Address:	Alperton, Wembley	Sampled By:	Client

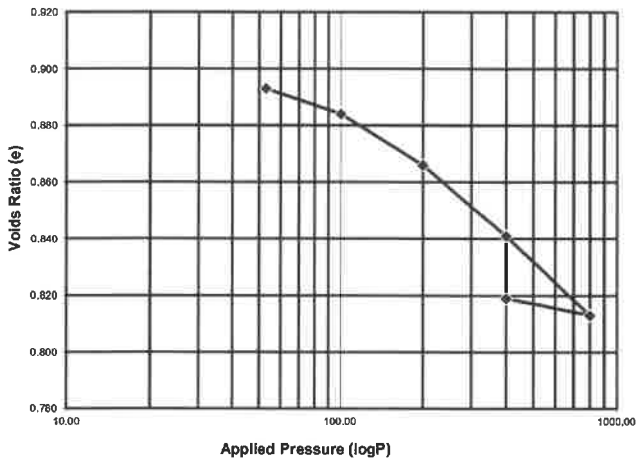
Test Details

Location:	BH1	
Sample Ref:	U1	
Sample Description:	Firm brown grey orange-brown CLAY	
Particle Density (Mg/m^3):	2.74	Assumed
Mean Lab Temp. (°C):	22	
Variations from Standard:	None	
Lab Reference:	PL6570-1-1	
Depth:	2.95m	

Specimen Details

	INITIAL	FINAL
Height (mm):	18.91	18.17
Bulk Density (Mg/m^3):	1.92	1.95
Moisture Content (%):	33	29
Dry Density (Mg/m^3):	1.45	1.51
Voids Ratio:	0.893	0.819
Degree of Saturation (%):	100.0	98.7
Diameter (mm):	74.96	N/A
Swelling Pressure (kPa):	53	N/A
Method of time fitting used:	Log Time	N/A

Voids Ratio against logarithm of Applied Pressure



Applied Pressure (kPa)	Coefficient of Compressibility m_v (m^2/MN)	Coefficient of Consolidation c_v (m^2/year)
53		
100	0.10	0.47
200	0.09	0.36
400	0.07	0.36
800	0.04	0.52
400	0.01	---

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TEST CERTIFICATE

One-Dimensional Consolidation Properties

(Tested in accordance with BS1377 : Part 5 1990)

Client:	Ground Engineering Ltd	Certificate Number:	PL6570-1-22/731
Client Address:	Newark Road	Client Reference Number:	C14666
	Peterborough	Date Sampled:	Unknown
	Cambridgeshire	Date Received:	06.02.2019
Postcode:	PE1 5UA	Date Tested:	21.02.2019
Contact:	Simon Weatherley	Sampling Certificate No:	N/A
Site Name:	Land adj Atlip Road	Certificate of Sampling:	N/A
Site Address:	Alperton, Wembley	Sampled By:	Client

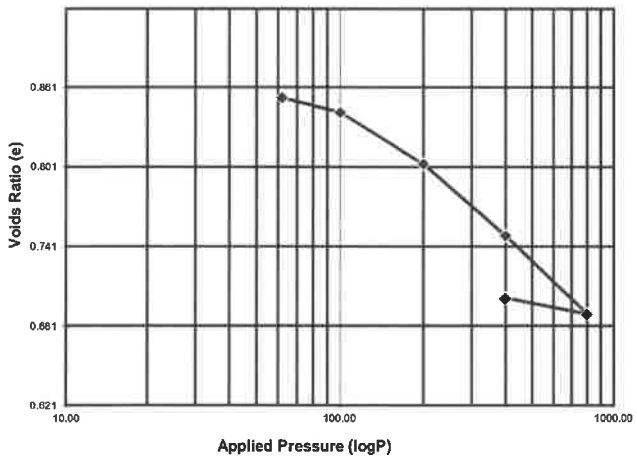
Test Details

Location:	BH2	
Sample Ref:	U3	
Sample Description:	Stiff fissured brown orange-brown CLAY with some selenite	
Particle Density (Mg/m^3):	2.74	Assumed
Mean Lab Temp. (^{o}C):	22	
Variations from Standard:	None	
Lab Reference:	PL6570-1-22	
Depth:	6.60m	

Specimen Details

	INITIAL	FINAL
Height (mm):	19.02	17.46
Bulk Density (Mg/m^3):	1.94	2.10
Moisture Content (%):	31	30
Dry Density (Mg/m^3):	1.48	1.61
Voids Ratio:	0.853	0.702
Degree of Saturation (%):	99.2	100.0
Diameter (mm):	74.95	N/A
Swelling Pressure (kPa):	62	N/A
Method of time fitting used:	Log Time	N/A

Voids Ratio against logarithm of Applied Pressure



Applied Pressure (kPa)	Coefficient of Compressibility m_v (m^2/MN)	Coefficient of Consolidation c_v (m^2/year)
62		
100	0.16	0.89
200	0.21	0.78
400	0.15	0.72
800	0.08	0.69
400	0.02	---

GROUND ENGINEERING

Newark Road Peterborough

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TEST CERTIFICATE

One-Dimensional Consolidation Properties

(Tested in accordance with BS1377 : Part 5 1990)

Client:	Ground Engineering Ltd	Certificate Number:	PL6570-1-32/731
Client Address:	Newark Road	Client Reference Number:	C14666
	Peterborough	Date Sampled:	Unknown
	Cambridgeshire	Date Received:	06.02.2019
Postcode:	PE1 5UA	Date Tested:	21.02.2019
Contact:	Simon Weatherley	Sampling Certificate No:	N/A
Site Name:	Land adj Atlip Road	Certificate of Sampling:	N/A
Site Address:	Alperton, Wembley	Sampled By:	Client

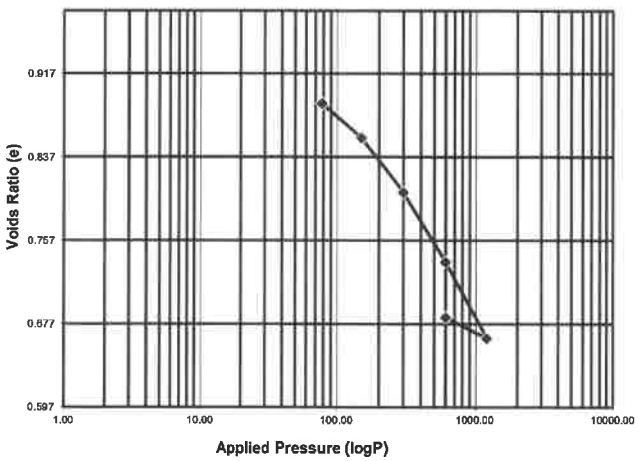
Test Details

Location:	BH3	
Sample Ref:	U3	
Sample Description:	Firm brown CLAY with some selenite	
Particle Density (Mg/m^3):	2.74	Assumed
Mean Lab Temp. (^{o}C):	22	
Variations from Standard:	None	
Lab Reference:	PL6570-1-32	
Depth:	4.55m	

Specimen Details

	INITIAL	FINAL
Height (mm):	18.71	16.69
Bulk Density (Mg/m^3):	1.92	2.13
Moisture Content (%):	32	31
Dry Density (Mg/m^3):	1.45	1.63
Voids Ratio:	0.888	0.683
Degree of Saturation (%):	98.8	100.0
Diameter (mm):	75.01	N/A
Swelling Pressure (kPa):	78	N/A
Method of time fitting used:	Log Time	N/A

Voids Ratio against logarithm of Applied Pressure



Applied Pressure (kPa)	Coefficient of Compressibility m_v (m^2/MN)	Coefficient of Consolidation c_v (m^2/year)
78		
150	0.24	1.50
300	0.19	0.62
600	0.12	0.48
1200	0.07	0.44
600	0.02	---

GROUND ENGINEERING

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TEST CERTIFICATE

One-Dimensional Consolidation Properties

(Tested in accordance with BS1377 : Part 5 1990)

Client:	Ground Engineering Ltd	Certificate Number:	PL6570-1-34/731
Client Address:	Newark Road	Client Reference Number:	C14666
	Peterborough	Date Sampled:	Unknown
	Cambridgeshire	Date Received:	06.02.2019
Postcode:	PE1 5UA	Date Tested:	21.02.2019
Contact:	Simon Weatherley	Sampling Certificate No:	N/A
Site Name:	Land adj Atlip Road	Certificate of Sampling:	N/A
Site Address:	Alperton, Wembley	Sampled By:	Client

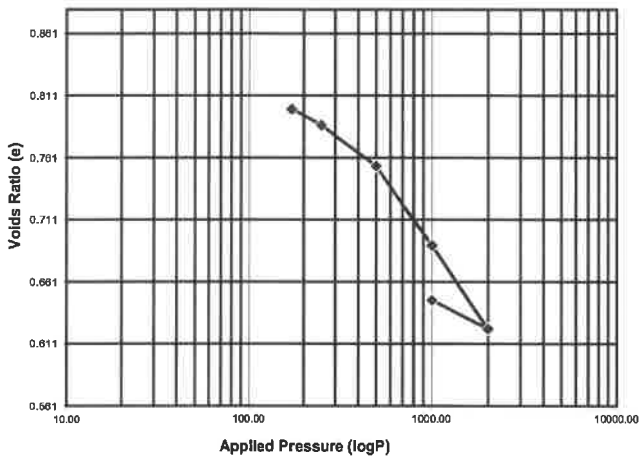
Test Details

Location:	BH3	
Sample Ref:	U5	
Sample Description:	Very Stiff fissured dark brown CLAY	
Particle Density (Mg/m^3):	2.74	Assumed
Mean Lab Temp. (°C):	22	
Variations from Standard:	None	
Lab Reference:	PL6570-1-34	
Depth:	10.05m	

Specimen Details

	INITIAL	FINAL
Height (mm):	18.87	17.25
Bulk Density (Mg/m^3):	1.97	2.11
Moisture Content (%):	29	27
Dry Density (Mg/m^3):	1.52	1.66
Voids Ratio:	0.800	0.646
Degree of Saturation (%):	100.0	100.0
Diameter (mm):	74.98	N/A
Swelling Pressure (kPa):	172	N/A
Method of time fitting used:	Log Time	N/A

Voids Ratio against logarithm of Applied Pressure



Applied Pressure (kPa)	Coefficient of Compressibility m_v (m^2/MN)	Coefficient of Consolidation c_v (m^2/year)
172		
250	0.02	0.35
500	0.10	0.30
1000	0.07	0.27
2000	0.04	0.65
1000	0.01	---

The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

C14666 Atlip Road, Alperton, Wembley

Quotation No.:		**Date Received:**	28-Jan-2019
Order No.:	C14666	**Date Instructed:**	28-Jan-2019
No. of Samples:	7		
Turnaround (Wkdays):	5	**Results Due:**	01-Feb-2019
Date Approved:	04-Feb-2019		
Approved By:			

Chemtest
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Results - Soil

Project: C14666 Atlip Road, Alperton, Wembley

Client: Ground Engineering Limited					**Chemtest Job No.:**	19-02804	19-02804	19-02804	19-02804	19-02804	19-02804
Quotation No.:					**Chemtest Sample ID.:**	761334	761335	761336	761337	761338	761339
					Client Sample ID.:	B1	B3	B1	B1	B2	B1
					Sample Location:	BH1	BH1	BH2	BH3	BH3	BH4
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.40	1.90	0.50	0.30	1.50	0.50
					Bottom Depth (m):	1.10	2.40	1.10	1.00	2.00	1.10
					Date Sampled:	14-Jan-2019	14-Jan-2019	15-Jan-2019	18-Jan-2019	18-Jan-2019	17-Jan-2019
					Asbestos Lab:	COVENTRY	IN-TRAN-C	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
pH	U	2010		N/A		11.0	8.6	8.3	11.8	9.3	9.2
Moisture	N	2030	%	0.020		12	20	14	6.2	18	9.2
Stones and Removed Materials	N	2030	%	0.020		< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		1.1	3.7	2.2	0.61	1.6	1.8
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		1.1	1.1	1.4	0.45	0.51	0.33
Cyanide (Free)	U	2300	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50		< 0.50	34	4.7	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50		4.9	330	27	17	5.2	5.5
Arsenic	U	2450	mg/kg	1.0		19	20	32	21	16	22
Cadmium	U	2450	mg/kg	0.10		0.34	0.17	0.44	0.13	0.12	0.46
Chromium	U	2450	mg/kg	1.0		20	39	30	16	32	19
Copper	U	2450	mg/kg	0.50		290	54	96	73	37	27
Mercury	U	2450	mg/kg	0.10		0.13	0.50	2.9	0.17	0.53	0.39
Nickel	U	2450	mg/kg	0.50		48	38	45	20	30	20
Lead	U	2450	mg/kg	0.50		68	190	470	30	97	210
Selenium	U	2450	mg/kg	0.20		< 0.20	0.84	0.87	< 0.20	0.75	< 0.20
Zinc	U	2450	mg/kg	0.50		200	110	420	45	58	120
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40		1.9	3.5	11	0.50	2.4	2.6
Acenaphthene	U	2700	mg/kg	0.10		0.11	< 0.10	0.48	< 0.10	< 0.10	0.42
Acenaphthylene	U	2700	mg/kg	0.10		0.29	< 0.10	1.1	< 0.10	< 0.10	1.1
Anthracene	U	2700	mg/kg	0.10		0.43	< 0.10	1.9	0.21	0.23	0.41
Benzo[a]anthracene	U	2700	mg/kg	0.10		3.3	0.34	5.7	0.77	0.70	2.0
Benzo[a]pyrene	U	2700	mg/kg	0.10		2.8	0.28	5.8	0.65	0.42	2.2
Benzo[b]fluoranthene	U	2700	mg/kg	0.10		4.2	0.33	7.8	0.98	0.71	3.2
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10		2.4	0.10	4.2	0.30	0.33	2.3
Benzo[k]fluoranthene	U	2700	mg/kg	0.10		1.8	0.13	3.2	0.33	0.31	1.5
Chrysene	U	2700	mg/kg	0.10		4.6	0.49	7.1	1.1	0.97	2.8
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10		1.3	< 0.10	1.5	0.21	0.12	0.69
Fluoranthene	U	2700	mg/kg	0.10		4.3	0.39	11	1.4	1.1	3.1
Fluorene	U	2700	mg/kg	0.10		0.17	< 0.10	0.90	< 0.10	< 0.10	0.12
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10		2.6	< 0.10	4.3	0.48	0.14	1.8
Naphthalene	U	2700	mg/kg	0.10		0.42	< 0.10	0.81	< 0.10	< 0.10	0.21
Phenanthrene	U	2700	mg/kg	0.10		1.7	< 0.10	7.4	0.95	0.77	1.5
Pyrene	U	2700	mg/kg	0.10		5.7	0.50	11	1.6	1.2	3.6
Total Of 16 PAH's	U	2700	mg/kg	2.0		36	2.6	74	9.0	7.0	27
Total Phenols	U	2920	mg/kg	0.30		< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

Chemtest
The right chemistry to deliver results

Results - Soil

Project: C14666 Atlip Road, Alperton, Wembley

Client: Ground Engineering Limited					**Chemtest Job No.:**	19-02804	19-02804	19-02804	19-02804	19-02804	19-02804
Quotation No.:					**Chemtest Sample ID.:**	761334	761335	761336	761337	761338	761339
					Client Sample ID.:	B1	B3	B1	B1	B2	B1
					Sample Location:	BH1	BH1	BH2	BH3	BH3	BH4
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.40	1.90	0.50	0.30	1.50	0.50
					Bottom Depth (m):	1.10	2.40	1.10	1.00	2.00	1.10
					Date Sampled:	14-Jan-2019	14-Jan-2019	15-Jan-2019	18-Jan-2019	18-Jan-2019	17-Jan-2019
					Asbestos Lab:	COVENTRY	IN-TRAN-C	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
ACM Type	U	2192		N/A	-	-	Fibres/Clumps	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	Stereo Microscopy	-	-	-
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.8
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	93	< 1.0	7.2	< 1.0	< 1.0	67
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	93	< 5.0	7.2	< 5.0	< 5.0	71
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	2.6	< 1.0	4.5
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	12	< 1.0	5.1	18	< 1.0	6.4
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	320	< 1.0	13	3.7	< 1.0	110
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	330	< 5.0	19	25	< 5.0	120
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	420	< 10	26	25	< 10	190

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Results - Single Stage WAC

Project: C14666 Atlip Road, Alperton, Wembley

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	19-02804						
Chemtest Sample ID:	761340						
Sample Ref:							
Sample ID:	B2						
Sample Location:	BH4						
Top Depth(m):	1.20						
Bottom Depth(m):	1.70						
Sampling Date:	17-Jan-2019						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	1.5	3	5	6
Loss On Ignition	2610	U	%	3.1	--	--	10
Total BTEX	2760	U	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg	< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg	110	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	23	100	--	--
pH	2010	U		10.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.080	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	< 0.0010	< 0.050	0.5	2	25
Barium	1450	U	0.0041	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.050	0.5	10	70
Copper	1450	U	< 0.0010	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	< 0.0010	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.50	4	50	200
Chloride	1220	U	1.0	10	800	15000	25000
Fluoride	1220	U	0.10	1.0	10	150	500
Sulphate	1220	U	11	110	1000	20000	50000
Total Dissolved Solids	1020	N	49	490	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	8.1	81	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	8.5

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser. using N.N–dimethyl-p-phenylenediamine.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding. e.g. 3-band – GRO. DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6. >C6–C8.>C8–C10. >C10–C12. >C12–C16. >C16–C21. >C21–C35. >C35– C44Aromatics: >C5–C7. >C7–C8. >C8– C10. >C10–C12. >C12–C16. >C16– C21. >C21– C35. >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)

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Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

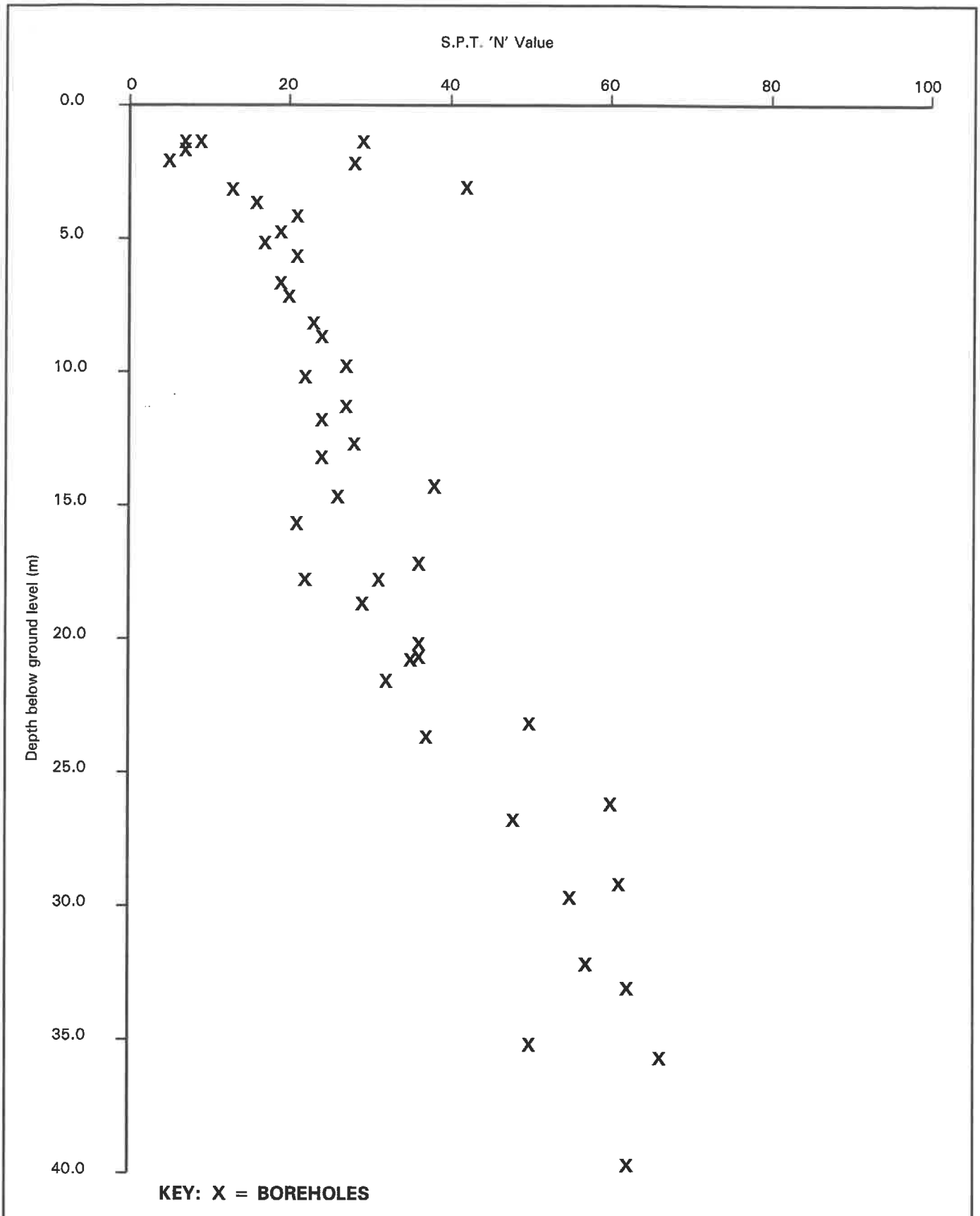
Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

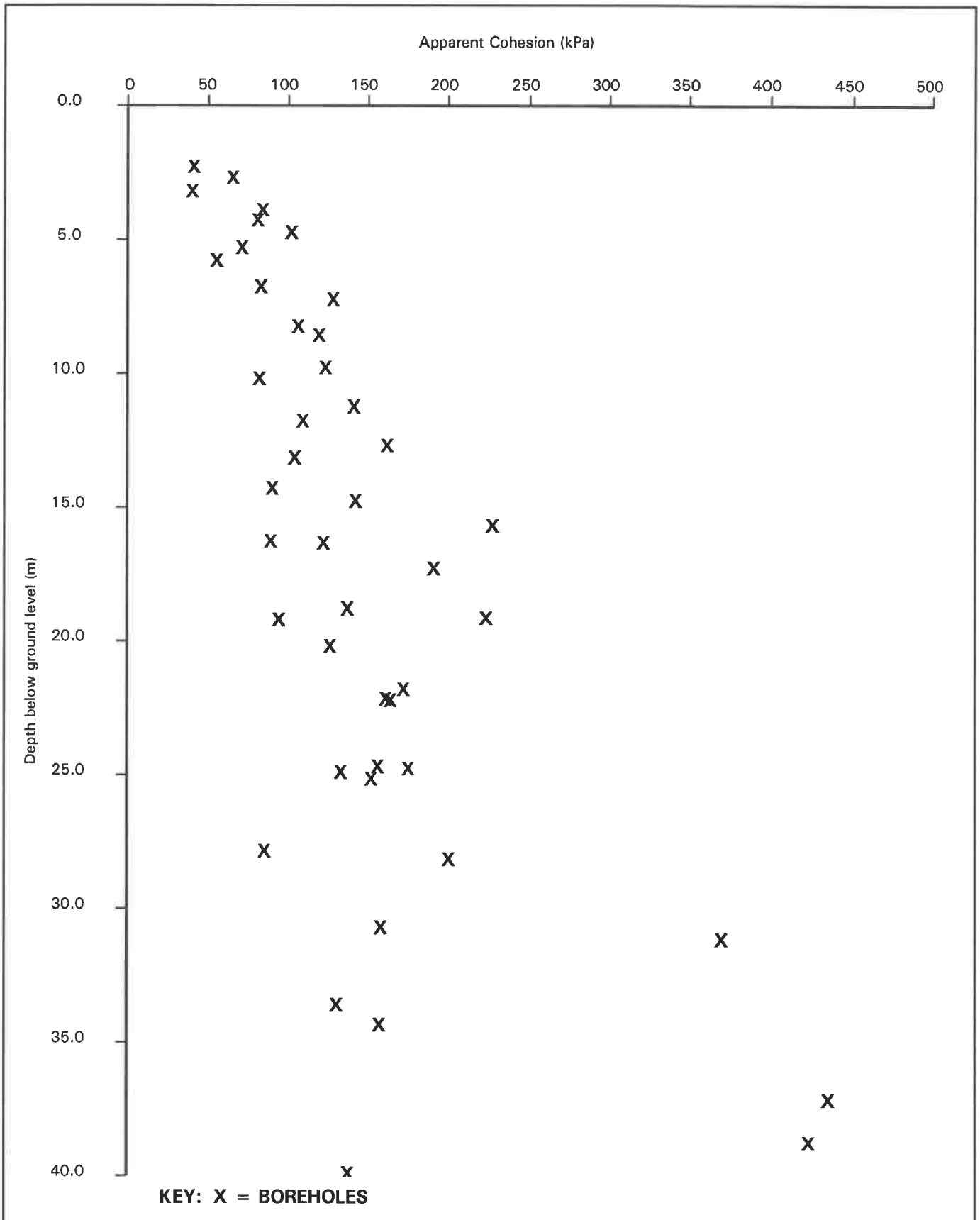
All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



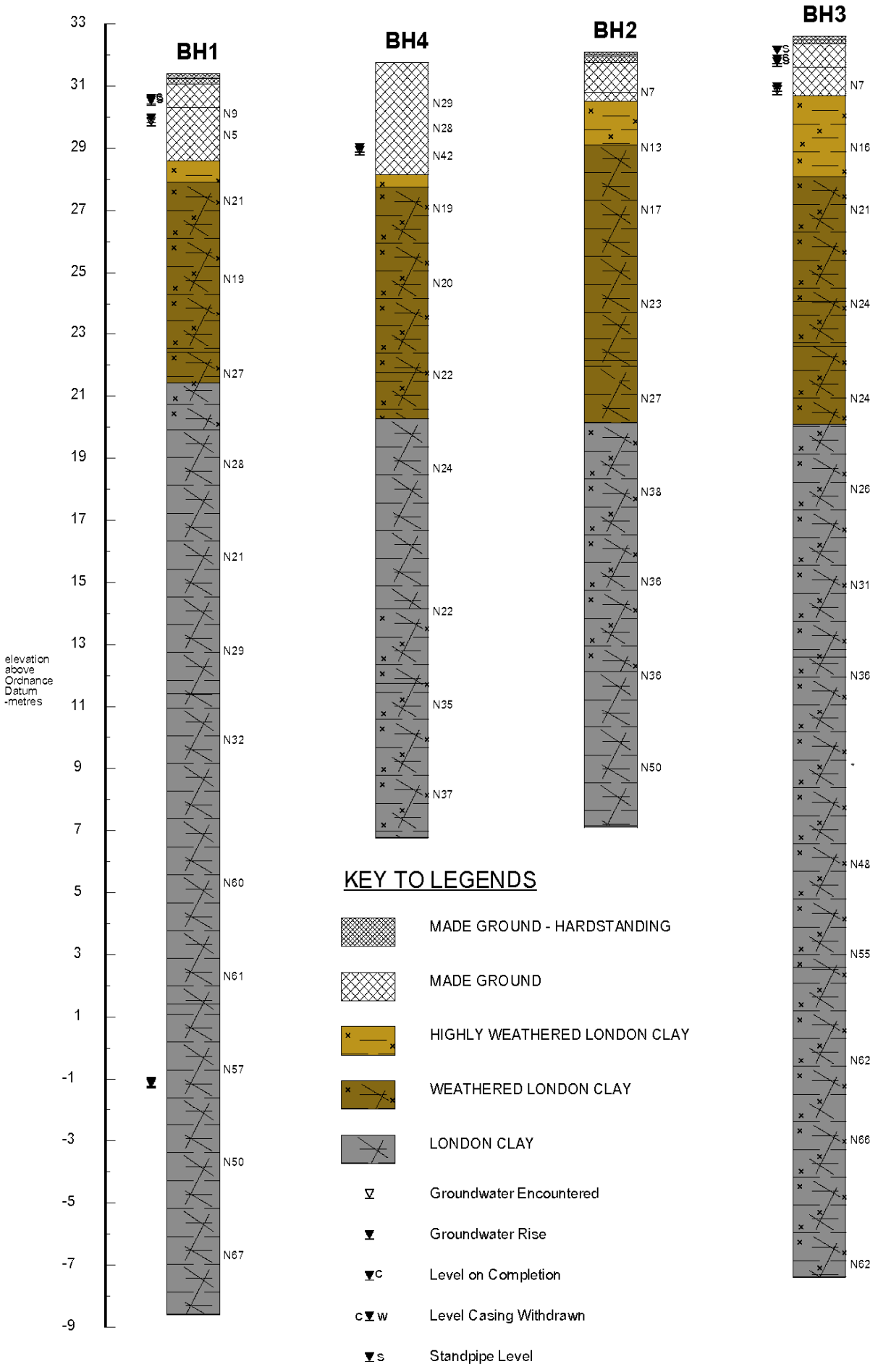
S.P.T. 'N' Value vs Depth below ground level (m).

SITE	LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY	
CLIENT	ATLIP HOUSE LIMITED	Contract Number 14666
GROUND ENGINEERING LIMITED Tel: 01733-566566 www.groundengineering.co.uk	Date 15/04/19	Figure 1



Apparent Cohesion (kPa) vs Depth below ground level (m).

SITE	LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY		
CLIENT	ATLIP HOUSE LIMITED		Contract Number 14666
GROUND ENGINEERING LIMITED	Tel: 01733-566566 www.groundengineering.co.uk	Date 15/04/19	Figure 2



SITE	LAND ADJ. ATLIP ROAD, ALPERTON, WEMBLEY		Contract No. 14666
CLIENT	ATLIP HOUSE LIMITED	Soil Profile	Vertical Scale 1:175
© GROUND ENGINEERING, NEWARK ROAD, PETERBOROUGH. Tel (01733) 566566		Date 15/04/19	Fig. No 3

APPENDIX 2:

Proposed Development

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