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Berol Quarter Planning Statement

16 January 2023

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1.0 Introduction

1.1 This Planning Statement has been prepared on behalf of the applicant, Berol Quarter Limited (the ‘Applicant’), to accompany a full planning application for the redevelopment of Berol House and 2 Berol Yard, Ashley Road, Tottenham, London, together forming the Berol Quarter (the ‘Site’). The Site is positioned between Watermead Way and Ashley Road and is located within the east of the London Borough of Haringey (LBH), within the electoral ward of Tottenham Hale.

1.2 The Site comprises an existing office building comprising c.3,400 sqm of office space and a vacant plot of land, most recently used as a construction site for neighbouring development and car parking for the tenants within Berol House. The Site sits within the Ashley Road South Masterplan (ARSM), Tottenham Hale, London.

1.3 A previous planning application on this Site received planning permission (ref HGY/2017/2044) on 8 June 2018 for:

“Application for full planning permission for the demolition of the existing buildings within the Berol Yard site and retention of Berol House. Erection of two buildings between 8 and 14 storeys providing 166 homes, 694 sqm (GEA) of commercial floorspace (Class A1/A3/B1), 7,275 sqm (GEA) of education floorspace (Class D1), car and cycle parking, open space, landscaping and other associated works.

Application for outline planning permission (all matters reserved) for the alteration and conversion of ground, first and second floors of Berol House with up to 3,685 sqm (GEA) of commercial floorspace (A1/A3/B1) and the introduction of a two-storey roof level extension introducing up to 18 homes, cycle parking and other associated works.”

1.4 A separate Section 73 application will be submitted in pursuit of HGY/2017/2044 to close out any conditions relating to the delivery of the Site.

1.5 The new full planning application now proposes the comprehensive refurbishment and extension of Berol House to provide high quality workspace and retail accommodation, alongside a new residential led mixed use building accommodating Build to Rent (BtR) homes alongside commercial/retail space. The intention is to replace the college building with a prominent landmark mixed use building, while reinforcing the role of Berol House as the centrepiece of the ARSM development. The proposed development comprises the following:

“Full planning permission for the refurbishment and extension of Berol House to include Use Class E floorspace and the redevelopment of 2 Berol Yard to provide new residential homes, Use Class E floorspace and associated landscaping, public realm improvements, car and cycle parking and other associated works.”

Background

1.6 The surrounding area of Tottenham Hale has been experiencing transformational regeneration in recent years and will continue to do so into the near future. Tottenham is identified as one of the Greater London Authority’s (GLA) Housing Zones, earmarked to

deliver 1,965 homes, and Tottenham Hale also falls within the GLA's Upper Lea Valley Opportunity Area, which has scope to provide a minimum of 15,000 jobs and 20,100 new homes. Within the Upper Lea Valley, Tottenham Hale is considered a growth point, suitable for higher density development.

- 1.7 At a local level, the area has also been identified as a new District Centre through the District Centre Framework (DCF, 2015), promoting a mix of town centre and residential uses in this immediate area. The DCF sets a clear ambition for housing and employment-led regeneration around Ashley Road. Ashley Road South was identified in the Tottenham Area Action Plan (2017) (Tottenham AAP) under Site Allocation TH6. These documents provide useful context in terms of the vision for Tottenham Hale and how they allow the recent permissions and patterns of delivery to be considered against the development capacities identified.
- 1.8 The Tottenham AAP identified scope for c. 5,600 new homes and 43,000sqm commercial floorspace at the identified opportunity sites in Tottenham Hale. To-date permission has been granted for c. 3,000 homes and c. 19,000sqm commercial space.

Ashley Road South Masterplan

- 1.9 The ARSM was developed jointly by the Applicant and Notting Hill Genesis (NHG) on 2.67ha of land north of Tottenham Hale Station. The area was previously occupied by a number of one and two storey industrial warehouses with their associated yards. The ARSM area's development has been brought forward through four discrete planning applications, alongside an adjacent permission for the NHG site immediately to the south. These permissions comprise:
- Berol Yard (including Berol House) (BSD) - c 184 homes, with up to 3,685sqm of commercial space and an education facility approved in June 2018.
 - Ashley Gardens (BSD) - 417 homes and 1,200sqm commercial space approved in June 2018 (amended April 2020).
 - Cannon Factory/Ashley House (NHG) - 256 homes and 3,600sqm commercial space approved in May 2018.
 - Ashley Park (NHG) - 97 homes and 170sqm commercial space approved in April 2020.
- 1.10 The Applicant's developments have all been delivered or are currently under construction. Alongside the ARSM developments, Argent Related, Anthology, Newlon (with BSD) and Muse developments have progressed planning applications for a number of neighbouring developments. These are discussed in further detail in Section 2 of this planning statement.

Berol Quarter

- 1.11 The Applicant received planning permission at Berol Yard (ref: HGY/2017/2044) on 8 June 2018 for:

“Application for full planning permission for the demolition of the existing buildings within the Berol Yard site and retention of Berol House. Erection of two buildings between 8 and 14 storeys providing 166 homes, 694 sqm (GEA) of commercial floorspace (Class A1/A3/B1), 7,275 sqm (GEA) of education floorspace (Class D1), car and cycle parking, open space, landscaping and other associated works.

Application for outline planning permission (all matters reserved) for the alteration and conversion of ground, first and second floors of Berol House with up to 3,685 sqm (GEA) of commercial floorspace (A1/A3/B1) and the introduction of a two-storey roof level extension introducing up to 18 homes, cycle parking and other associated works.”

- 1.12 Since the original planning permission was granted there have also been several non-material amendments (Section 96a) that have been made to the scheme.
- 1.13 The permission has been partially built out with building 4 and the associated public realm, now known as the Gessner, having been completed and occupied in 2021.
- 1.14 Berol House has not been progressed and the site of the National College of Digital Skills (NCDS) remains undeveloped. The proposed operator of the college, ADA, was unable to finance and deliver the college and pulled out of the contract to provide the facility, despite the Applicant providing a significant extension to the Contract and engaging directly with the Department for Education in an effort to support the viability of the scheme. The Applicant subsequently appointed leading agent Knight Frank and their specialist education and life sciences team, to undertake extensive marketing in attempt to secure an alternative academic or life science occupant/operator for the college site. Unfortunately, after 32 months of marketing, a bespoke website and engaging with the “Innovation Corridor”, no other prospective operator has shown an interest in the development of an education or life sciences facility at the Site. Further details can be found within the Knight Frank Marketing (October 2022) report which accompanies this application.
- 1.15 As a result, the Applicant is revisiting planning permission HGY/2017/2044 in the context of the loss of ADA and the subsequent marketing exercise to develop a scheme that aligns with the ARSM and which delivers new homes and jobs, wider public realm enhancements, significant enhancement to the townscape and visual amenity, and new community facilities. The scheme represents a far more efficient, sustainable and attractive use than the scheme under permission HGY/2017/2044.
- 1.16 As part of the Applicant’s long-term commitment to the area, it has retained the non-residential elements of the previous planning approvals. This application and the proposed redevelopment of Berol House respond to the Applicant’s knowledge of the area and belief in curating a commercial and retail destination at the heart of the Ashley Road neighbourhood.
- 1.17 Prior to the submission of this planning application, the Applicant has engaged in detailed pre-application discussions with LBH and the GLA since June 2022 and carried out public consultation with local residents and businesses on 18th July 2022. The proposed development has evolved in direct response to feedback received and is the culmination and product of the extensive, inclusive and responsive pre-application design development process.

Scope of application

- 1.18 This Planning Statement should be read in conjunction with the following accompanying application forms, drawings and supporting documents, which have been prepared accordingly to assess the application:
1. Application form;

2. CIL additional information form;
3. Application Drawings and Schedules prepared by Allies & Morrison and John McAslan & Partners;
4. Design and Access Statement, prepared by Allies and Morison, John McAslan and Partners and Churchman, Thornhill Finch;
5. Planning Statement, prepared by Lichfields;
6. Heritage Statement, prepared by Lichfields;
7. Townscape and Visual Impact Assessment with Tall Building Statement and verified views, prepared by Lichfields;
8. Flood Risk and Drainage Statement, prepared by WSP;
9. Wind Impact Assessment, prepared by WSP
10. Energy Statement, prepared by WSP;
11. Sustainability Statement, prepared by WSP;
12. Whole Life Carbon Assessment, prepared by WSP;
13. Circular Economy Statement prepared by WSP;
14. Transport statement including draft Travel plan, draft Construction Logistics Plan and Delivery and Servicing Plans, prepared by WSP;
15. Health Impact Assessment, prepared by Lichfields;
16. Daylight, Sunlight, Overshadowing Assessment, prepared by Lichfields;
17. Air Quality Assessment, prepared by WSP;
18. Noise Impact Assessment, prepared by WSP;
19. Sustainable Waste Management Plan, prepared by WSP;
20. Statement of Community Engagement by Concilio;
21. Fire Safety reports, prepared by AESG;
22. Construction Management Plan, prepared by Formation D&B;
23. Retail Strategy, prepared by BSD;
24. Vibration Assessment, prepared by WSP;
25. Marketing Report, prepared by Knight Frank.
26. Archaeology Assessment, prepared by AOC Archaeology Group;
27. Ecology Assessment, prepared by Lichfields (ES chapter submitted as part of HGY/2017/2044); and
28. Ground Contamination report prepared by Delta Simmons (appended to the Planning Statement).

1.19 The scope of the planning application documents have been agreed with Officers at LBH prior to submission of the application.

- 1.20 The application will be accompanied by a separate Section 73 application which seeks to amend any conditions on HGY/2017/2044 relating to the delivery of Berol House and the college.

Structure of Planning Statement

- 1.21 This Planning Statement comprises the following subsequent sections:
- Section 2.0 provides a description of the site and surroundings;
 - Section 3.0 provides an overview of the planning and project history;
 - Section 4.0 summarises the pre-application consultation process;
 - Section 5.0 describes the proposed development;
 - Section 6.0 summaries the relevant planning policy and guidance;
 - Section 7.0 contains an assessment of the proposed development in planning terms;
 - Section 8.0 sets out the draft S106 Head of Terms and the proposed CIL costs;
 - Section 9.0 outlines the key benefits of the proposed development; and
 - Section 10.0 sets out a summary and our conclusions.

2.0 Site and surroundings

2.1 This section discusses the Site and the surrounding context.

The Site

2.2 The Site comprises 2 Berol Yard, a currently vacant plot of land on Watermead Way, and Berol House, the former Berol pencil factory, which is now an existing office building, that runs north-south along Ashley Road. It forms an L shaped parcel of land with a total area of 2.67 hectares.

2.3 2 Berol Yard is a vacant plot, most recently used as a construction site for neighbouring development and temporary car parking. Part of the car park is currently being utilised for the construction of the One Ashley Road scheme to the south of the Site.

2.4 Berol House is a three storey locally listed building. The building was constructed in the early 1900s, having been built by 1913 and is built of yellow stock brick with red brick. The building was a former pencil factory owned by the Berol Company who produced the famous Berol pencil at the Site. Currently, Berol House is used as a serviced office building.

2.5 The Site is bounded:

- 1 To the north by Cannon Factory which has permission for new homes and commercial space, as part of the NHH outline application (HGY/2016/4165). Beyond this the Harris Academy, which provides secondary education for 11-18 year olds and is due to increase in capacity of up 1,500 students;
- 2 To the northeast by the Gessner which comprises 166 build to rent homes and commercial floorspace and was delivered by the Applicant;
- 3 To the east by Watermead Way and beyond this Hale Village which provides new residential and student accommodation, retail, and community facilities;
- 4 To the south by One Ashley Road, which is under construction and being delivered by Argent Related. One Ashley Road will comprise two residential towers with the first three floors being retail and office space. Further south lies Tottenham Hale Station and the Tottenham Hale District Centre which mainly comprises Tottenham Hale Retail Park on the opposite side of Ferry Lane; and
- 5 To the west by Ashley Road and the development plots of Ashley Gardens, Ashley House and Ashley Park which will provide new residential accommodation. Down Lane Park is located further west and northwest and is within a 2 minute walking distance.

2.6 Vehicular access to the Site is from Ashley Road to the east of the Site which connects to Watermead Way (A1055) to the south and Down Lane Park to the north. Watermead Way further connects the Site to North London and the A406 (North Circular Road) to the north and to Tottenham High Road to the west (A10).

2.7 Ashley Road currently provides a number of on-street parking spaces. The access to Ashley Road from the south is proposed to be amended as part of the wider highways works proposed by Adams & Sutherland. The road is also subject to further highway improvement works. A new loading bay adjacent to the east of the Site on Watermead Way which was paid for by the Applicant as part of permission HGY/2017/2044 has been installed.

- 2.8 The Site is highly accessible via a range of public transport options and has a PTAL of 5-6a (where 1 is least accessible and 6b is most accessible). Tottenham Hale Underground Station is 180m from the masterplan site. As part of the proposed Crossrail 2 route a new station would be opened at Tottenham Hale; further increasing the area's accessibility. The Site is also within close proximity of Tottenham Hale Bus Station which is served by eight regular services to Archway Station, Bank, Waterloo, Wood Green, Enfield, Walthamstow, Trafalgar Square, Victoria Bus Station and Kings Cross.
- 2.9 The Site is not located within a Conservation Area. There are no listed buildings within or within proximity to the Site. Berol House, which is located within the centre of the site on Ashley Road, is a locally listed building and will be retained and enhanced as part of these development proposals.
- 2.10 The Site is within Flood Zone 2 (the zone of moderate flood risk).
- 2.11 An Air Quality Management Area (AQMA) applies across the borough due to emissions related particulate matter (PM10) and nitrogen dioxide (NO2).

Surrounding area

- 2.12 The surrounding area is characterised by the Site's immediate context within the ARSM and its location within the Tottenham Hale Housing Zone. The following section discusses the immediate context of the Site within the ARSM followed by a discussion of the wider area within the Tottenham Hale Housing Zone.
- 2.13 Please see Appendix 1 for a full list of approved and emerging developments in the surrounding area.

The Ashley Road South Masterplan

- 2.14 The Site sits within the central and southern eastern sections of the ARSM. The ARSM is bounded by Down Lane Park the north which also wraps around the western boundary and contains a children's playground, an existing nursery, tennis courts, bowling green and BMX track. Adjacent to Down Lane Park is the Harris Academy Tottenham which provides primary and secondary education. The site has been redeveloped to provided additional educational facilities for the Harris Academy (HGY/2015/3096).
- 2.15 To the east lies Watermead Way (A1055) and beyond this a number of Unite Student accommodation buildings and residential blocks within Hale Village (up to 33 storeys). Tottenham Hale Underground and Railway Station lies to the southeast.
- 2.16 To the south of the ARSM is the Ashley Road East and West developments by Argent Related and a single row of terrace houses which fall outside of the site boundary. In addition, the Stratford College London is located within the Sentinel House.
- 2.17 To the west of the ARSM is Down Lane Park and established residential neighbourhoods beyond, which are primarily characterised by two storey terraced housing. In this area lies Welbourne Primary School. Beyond this lies Tottenham High Road which provides a number of local amenities, services and facilities. Beyond this lies the residential area of Bruce Grove which contains primarily low-rise terrace housing.

- 2.18 The ARSM does not include any statutory designations such as conservation area areas, listed building or any nature designations. The collection of reservoirs to the east of the site (0.5km) has been identified as a SSSI's.
- 2.19 The buildings which comprise the ARSM are controlled by the Applicant and Notting Hill Genesis (NHG), who have worked collaboratively to deliver a high quality, coherent and integrated masterplan for the whole site. The following permissions are of relevance:
1. **Cannon Factory and Ashley House** submitted on behalf of Notting Hill Genesis. Permission HGY/02016/4165 was granted outline permission in 2018, with detailed planning permission was approved later in the same year under reference HGY/2018/2353. The permission includes the demolition of existing buildings on the site and redevelopment consisting of the erection of three buildings of up to 17 storeys in height, to provide up to 3,600sqm of commercial floorspace, up to 256 homes new public realm, landscaped amenity and all other associated works. Work has not yet begun.
 2. **Ashley Gardens** comprises a two residential-led mixed use buildings of up to 11 storeys, providing up to 417 homes and has been developed by the Applicant. Planning permission was approved in 2017 (HGY/2017/2045) and amended in 2019 (HGY/2019/2804) and in 2021 (HGY/2021/1170). The first phase, known as Rosa Luxemburg, was handed over in December 2021 and the remainder of the scheme is currently under construction.
 3. **Ashley Park** comprises a part six and eight storey residential-led mixed use building by Notting Hill Genesis, to deliver up to 97 residential homes. Planning permission was granted on appeal to NHG in January 2019 (HGY/2019/0108).
 4. **The Gessner (1 Berol Yard)** comprises a 14 storey residential-led mixed use building, developed by the applicant. The Gessner was approved in 2018 as part of a wider hybrid application (HGY/2017/2011). Works at the Gessner were completed in 2021.
- 2.20 Each of the approved applications included the Ashley Road corridor, to ensure that the landscaping and highways works came forward collaboratively and with each applicant paying a share of the costs.
- 2.21 The Applicant's developments are currently under construction or have been delivered. The Site represents the final piece of the masterplan to be delivered.

Other recent and emerging development activity in Tottenham Hale

- 2.22 Alongside the ARSM developments, Argent Related, Anthology, Newlon (with the Berkeley Square Developments) and Muse developments have progressed planning applications for a number of neighbouring developments.
- 2.23 As noted earlier, the surrounding area of Tottenham Hale is experiencing major regeneration by the GLA and Haringey.
- 2.24 The GLA allocated 31 Housing Zones across London in a bid to provide 150,000 associated jobs and 75,000 new homes over the next 10 years. Tottenham has been identified as one of the Housing Zones and it will provide 1,965 homes, of which 560 homes will be affordable.

- 2.25 Tottenham Hale also falls within the GLA's Upper Lea Valley Opportunity Area. This area will provide a minimum of 15,000 jobs and 20,100 new homes. The London Plan identifies a number of key growth points throughout the Upper Lea Valley including Tottenham Hale which is considered suitable for higher density development.
- 2.26 At the local level, the Tottenham AAP identifies Tottenham Hale as a key growth area where 5,000 jobs and 10,000 new homes will be delivered. The area has also been identified as a new District Centre and the Council DCF promotes a mix of town centre and residential uses in this immediate area.
- 2.27 As part of the Tottenham Hale Green and Open Space Strategy of November 2015, four bridges have been designed which are part of the Housing Zone infrastructure, to enable delivery of housing around Tottenham Hale.
- 2.28 One of the bridges being designed is the Central Rail Bridge, which would be for pedestrians and cyclists, spanning over Watermead Way and the Crossrail Corridor. The design development of this Bridge has progressed since the September 2015. The preferred design option would result in a Bridge landing in Ashley Road, adjacent to Berol House, connecting Ashley Road to Hale Village.
- 2.29 Given the wider regeneration objectives for Tottenham, the area surrounding the Site is experiencing transformational regeneration and a significant uplift in scale as promoted throughout the policy framework.
- 2.30 Notable large scale residential led mixed-use schemes within the surrounding area include:
- **One Station Square** (Millstream Tower) the was submitted by the Applicant (BSD) was consented planning permission in 2017 (HGY/2016/3932) for the mixed use development developed by the Applicant with maximum heights of 22 storeys to provide 128 residential homes, 434sqm of commercial floorspace, landscaped amenity space and all other structural and associated works. Development has been completed and is occupied.
 - **Hale Wharf**, Ferry Lane, submitted on behalf of Muse Developments Limited and the Canal and River Trust- was granted outline permission in 2017 (HGY/2016/1719) for the residential led mixed use development. This comprises of up to 505 homes, up to 1,607 sqm of flexible retail or business use and other associated servicing and provision, with maximum heights of 21 storeys. The scheme is currently under construction.
 - **Hale Village SW Plot** was granted consent in 2018 (HGY/2017/2005) for a mixed use development ranging from 11 to 33 storeys comprising 279 homes and up to 1,588 flexible commercial space. The scheme has been completed.
 - **Monument Way**, submitted on behalf of Newlon, was granted outline permission in 2017 (HGY/2016/2184) with reserved matters approved in 2018 (HGY/2018/0050). The scheme ranges with maximum heights of up to 5 storeys, providing 54 homes, landscaping and associated works.
 - **Strategic Development Partnership** (SDP) Site, submitted by Argent was granted planning permission in 2019 (HGY/2018/2223) to provide a mixed use development comprising of 6 buildings up to 38 storeys in height, to provide up to 1,036 homes, retail (Use Class A1-A4), health centre (Use Class D1), office (Use Class B1), leisure (Use

Class D2), parking, landscaping and other associated works. The scheme is currently under construction.

- **Ashley Road Depot** (HGY/2022/0752) recently received approval of the planning application in August 2022 for the erection of a development ranging in heights of 4-13 storeys, to provide 272 homes, 174 sqm of flexible class E floorspace, landscaping, parking and all other associated works.
- **The Hale**, was submitted on behalf of Jigsaw PMG Tottenham Ltd, received a resolution grant at committee in September 2022 (HGY/2021/2304), for the redevelopment of site including demolition of existing buildings to provide a part 7, part 24 storey building of 189 purpose-built student accommodation, with part commercial uses at ground and first floor and other associated works.

Summary

- 2.31 In summary, it is clear that there is a large amount of new development being delivered within Tottenham Hale. The majority of the development comprises new homes, however, there is broad mix of typologies including new commercial and community space.
- 2.32 In total, across Tottenham Hale, there is planning permission for 3417 homes in a mix of tenures (55% private housing for sale, 8% BtR and 32% affordable housing).
- 2.33 The Applicant is committed to delivering affordable housing across Tottenham Hale. The Applicant has delivered 711 homes within Tottenham Hale, of which 266 are affordable homes, equating to a total of 37% affordable homes.
- 2.34 Please see Appendix 1 for further detail.

3.0 **Planning history**

- 3.1 The Site is subject to extant planning permission (HGY/2017/2044), which includes 1 Berol Yard, 2 Berol Yard (college site) and Berol House. Planning permission was granted on 8 June 2018 for:

“Full planning permission for the demolition of the existing buildings within the Berol Yard site and retention of Berol House. Erection of two buildings between 8 and 14 storeys providing 166 homes, 891 sqm (GEA) of commercial floorspace (Class A1/A3/B1/D1), 7,275 sqm (GEA) of education floorspace (Class D1), car and cycle parking, open space, landscaping and other associated works.

Outline proposals (all matters reserved) for the alteration/conversion of ground, first and second floors of Berol House with up to 3,685 sqm (GEA) of commercial floorspace (A1/A3/B1/D1) and the introduction of a two storey roof level extension introducing up to 18 homes, cycle parking and other associated works. Amendments to scheme including replacement of accommodation with "build-to-rent" and reconfiguration of internal residential and commercial layout.”

- 3.2 Reserved Matters for appearance, landscaping, layout, scale and access in relation to Berol House (pursuant to Condition 1 of planning permission HG/2017/2044) were approved in 2020 (HGY/2020/0080). Since the original planning permission was granted there have also been several non-material amendments (Section 96a) that have been made to the scheme and conditions discharged to enable the development.
- 3.3 The residential component at 1 Berol Yard (now known as the Gessner) and associated public realm has been completed and has been in operation since 2021. The remaining two plots of the original hybrid planning application, the development of which has not commenced, comprise the college site (approved for education floorspace) and Berol House (approved for commercial floorspace and some residential in a roof level extension).

4.0 Consultation and engagement

- 4.1 This section summarises the pre-application discussion which the Applicant has undertaken with LBH the GLA and the Health and Safety Executive (HSE). It also sets out a summary of the public consultation which the Applicant has undertaken.

Pre-application feedback

- 4.2 The Applicant has engaged in three pre-application meetings with LBH, two LBH design officer meetings, two Quality Review Panel (QRP) reviews, one meeting with the GLA, a pre-application meeting with the HSE, a LBH Development Management Forum and an LBH Planning Committee Briefing between 28 June 2022 and 7 November 2022.
- 4.3 The Applicant has responded to key comments throughout the process and the site layout, massing and appearance of the proposed development have evolved at every stage. A timeline of the meetings is set out below and summary can be found in Appendix 2:
1. 28 June 2022 - LBH Pre-Application Meeting 1.
 2. 11 July 2022 - LBH QRP Meeting 1.
 3. 10 August 2022 - GLA Meeting 1.
 4. 22 August 2022 - LBH Pre-Application Meeting 2.
 5. 26 August 2022 - LBH Design Officer Meeting 1.
 6. 26 September 2022 - HSE Review Meeting.
 7. 5 October 2022 - LBH Development Management Forum.
 8. 7 October 2022 - LBH Pre-application Meeting 3.
 9. 18 October 2022 - LBH Design Officer Meeting 2.
 10. 19 October 2022 - LBH QRP Meeting 2.
 11. 7 November 2022 - LBH Members Briefing.
- 4.4 Full details of the specific changes made to the proposed development in response to this feedback can be found in the accompanying Design and Access Statement. In summary they included a reorientation of the layout of the proposed development to allow improved daylight and sunlight into the Gessner, a reduction in the overall height of 2 Berol Yard, a new community space, a new bridge landing head at 2 Berol Yard, removal of solar panels on the facade (following objections from the HSE), improved public realm, improved affordable housing offer, and changes to the architecture and materiality of Berol House and 2 Berol Yard.

Public consultation

- 4.5 A comprehensive programme of community engagement was undertaken by the Applicant. This began in June 2022 and included the following:
- **Digital consultation website** - A digital website was created to receive public comments continually over time as the proposals have evolved. This has been live since the 9 July 2022.

- **Engagement with locally elected representatives** - the Applicant sought to engage with the site's ward members from Haringey Council (Tottenham Hale Ward). On the 21 June 2022, a meeting was held with one of the ward councillors for Tottenham Hale Ward, Cllr Ruth Gordon and LB Haringey Tottenham Hale Lead, Emily Read. Ward councillors were updated with the details of the consultation process and were invited to the in-person session. Key comments were as follows:
 - Cllr Ruth Gordon showed positivity commented positively towards the Berol House through-links which would increase permeability through the ground floor.
 - Cllr Ruth Gordon welcomed the additional floors of employment proposed above Berol House in lieu of the homes.
 - Cllr Ruth Gordon suggested that tall buildings can work if they are well considered.
- **Engagement with interested community stakeholders** - invitation letters with the consultation details were sent to:
 - Living Under one Sun
 - Pavilions Pre School nursery
 - Harris Academy
 - Friends of Down Lane Park
- **In-person exhibition** - on the 18 July 2022 at the site to engage with key stakeholders, residents, and community representative in the area. Key responses were as follows:
 - The public welcomed the renovation of Berol House.
 - 95% of all respondents showed positivity towards activating the ground floor of Berol House and providing retail space.
 - The east-west link through Berol House was welcomed by many.
 - The public welcomed the new square proposal with green spaces and most commented to say they would likely visit.
 - Almost 85% of respondents were positive on the provision of new homes, including affordable.

4.6 A Statement of Community Involvement (SCI), prepared by Concilio Communications, has been submitted as part of this planning application which provides detailed analysis of the feedback received from local residents, the public and other stakeholders, and how the Applicant has sought to respond to the matters raised.

Summary

4.7 The proposed development has been developed in direct response to consultation feedback received. The scheme was revised to reflect detailed comments from pre-application discussions with the HSE, GLA and LBH.

- 4.8 The proposed development has also sought to respond to comments raised by local residents, the public and other stakeholders.
- 4.9 The proposed development has evolved significantly since the outset of the consultation process to result in a development which will deliver new housing, employment and infrastructure and public realm improvements to the wider Tottenham Hale area.

5.0 Proposed development

- 5.1 This section provides a description of the proposed development for which full planning permission is sought. A detailed description of the proposed development is also set out in the submitted Design and Access Statement and further details can be seen on the accompanying drawings.

Description of development

- 5.2 The Applicant is proposing to comprehensively refurbish and extend Berol House to provide high quality workspace and retail accommodation, and a new mixed use building accommodating BtR homes including commercial, retail and community space at 2 Berol Yard. The description of development is as follows:

“Full planning permission for the refurbishment and extension of Berol House to include Use Class E floorspace and the redevelopment of 2 Berol Yard to provide new residential homes, Use Class E floorspace and associated landscaping, public realm improvements, car and cycle parking and other associated works.”

Site layout

- 5.3 The layout of the proposed development will focus around Berol House, the erection of 2 Berol Yard and the interconnecting public realm. The components of the building are as follows:
- **Berol House** will be retained with the west of the Site. The building will be refurbished, and a three-storey extension will be erected at roof level covering the full extent of the roof plane on two of the three new floors. The third floor will be set back at the north and south. The extension will comprise a contemporary sympathetic addition to this locally listed building which will become the heart of the neighbourhood.
 - **2 Berol Yard** will be located to the east of Berol House at the eastern part of the Site. It comprises a building which has been rotated at an angle to respond to Berol House, the Gessner and the One Ashley Road on the upper floors. The western elevation of the ground floor of 2 Berol Yard will run parallel with Berol House with a 10.5m gap forming the new street. The southern elevation will run parallel with the One Ashley Road building to the south with a minimum distance of 10.2m. The eastern elevation will run parallel with Watermead Road to the east and the northern elevation will run parallel with the Gessner to the north.
- 5.4 New improved public realm comprising paving, street planting and street furniture will connect the buildings on the ground floor. There will be a new public square located to the southwest corner of the Site which will become a focal and navigation point for visitors and pedestrians.

Land use mix

- 5.5 The proposed development will introduce a mix of residential and non-residential floorspace.

- 5.6 2 Berol Yard will comprise 428sqm of Class E accommodation which is expected to comprise cafes and restaurants at ground floor level and 160.2sqm of community space at first floor level. It will comprise 210 homes on floors 1 to 29 and associated amenity space on the podium and at the proposed level 10 roof.
- 5.7 Berol House will comprise 5492 sqm (GIA) of Class E floorspace. There will be 428sqm of amenity space on the roof.
- 5.8 In total, the site proposes a total of 6,359 sqm (GIA) of Class E and F2 (community) floorspace, see Table 5.1 below.

Table 5.1 Berol Quarter: Proposed Class E (A1/A2/A3/D1/D2) and F2 Floorspace

	Class E GIA (sqm)	Class F2 GIA (sqm)	Total non-residential floorspace GIA (sqm)
2 Berol Yard	706	161	867
Berol House	5492	0	5492
Total			6359

Quantum, dwelling mix and density

- 5.9 Build to Rent (BtR) homes are proposed at 2 Berol Yard. Berol House will not include residential development.
- 5.10 The total residential floorspace proposed at 2 Berol Yard is 24,016 sqm. The overall residential quantum of development proposed at 2 Berol Yard comprises 210 homes.
- 5.11 The proposed dwelling mix, unit size and unit quantity are presented in Table 5.2 below. 2 Berol Yard will provide a mix of one, two and three bedroom homes.

Table 5.2 2 Berol Yard: Proposed Dwelling Mix

Flat type	No. of homes	% of homes	Wheelchair/accessible homes
Studio	20	10%	16
1 Bed	48	23%	
2 Bed 3 Person	21	10%	0
2 Bed 4 Person	93	44%	
3 Bed 5 Person	17	8%	6
3 Bed 6 Person	11	5%	
Total	210	100%	22 (10%)

- 5.12 10% of the total homes will be provided as wheelchair accessible/adaptable homes. This equates to 22 wheelchair adaptable homes being proposed.

Affordable housing provision

- 5.13 The Applicant is committed to providing 35% Discount Market Rent (DMR) affordable housing (by habitable room). This will be provided through DMR products, of which, 30% will be provided as London Living Rent (LLR). The Applicant proposes that 33% of the total two bed homes will be affordable and 78.6% of the total three bed homes will be affordable.

- 5.14 A total of 60 affordable homes across different unit sizes and tenures will be provided. This is broken down and shown in Table 5.3 below.

Table 5.3 Total Affordable Housing Homes

Tenure	Studio	1 Bed	2 Bed	3 Bed
Private	20	48	76	6
DMR	0	0	26	16
LLR	0	0	12	6
Total	20	48	114	28

- 5.15 A total of 202 affordable habitable rooms will be provided across different unit sizes and tenure. This is broken down and shown in Table 5.4 below.

Table 5.4 Total Affordable Housing Provision by Habitable Room

Tenure	Studio	1 Bed	2 Bed	3 Bed
Private	20	96	228	24
DMR	0	0	78	64
LLR	0	0	36	24
Total	20	96	342	112

- 5.16 The total proposed affordable split by habitable room is broken down and shown in table 5.5 below.

Table 5.5 Proposed Number of Affordable Homes per Habitable Room

Tenure	Habitable Rooms	Overall (%)	Affordable Housing (%)
DMR	142	25	70
LLR	60	11	30
Total	202	35	100

Height, scale and massing

- 1.2 Works to Berol House will comprise the addition of three new floors to a maximum height of 21.5m AOD, as detailed on the application drawings.

2 Berol Yard will rise to 30 storeys plus the ground floor and the lift overrun within the core. There will be a series of heights throughout the building with the maximum height being 118.07m. Further detail is provided in Table 5.6

Table 5.6 2 Berol Yard: Block Heights

Block	Floors	Number of Storeys	Height (m)
A	17	18	62.92
B	24	25	92.42
C	29	30	118.07
D	29	30	113.12
E	5	6	31.67

Materials and detailed design

- 5.17 The proposed development will be constructed using a palette of high quality, durable materials. Berol House and 2 Berol Yard will have a distinct design that responds to the wider integrated masterplan.
- 5.18 The form, appearance and materiality of each building will reflect its function, location, and role within the masterplan. The material and detailed design of each building is described in turn below.

Berol House

- 5.19 The restoration and extension to Berol House has been designed by John McAslan & Partners. The existing building will be retained and enhanced. The ground floor will be activated by creating a series of openings at the ground floor of the building to enable throughfare access and improve permeability between Ashley Road and Watermead Way.
- 5.20 The design proposes a sympathetic triple storey extension. The materials palette for the façade of the first two storeys of the extension incorporates terracotta tiling to provide a clad facade, with double-glazed windows. The windows of the extension will include powder coated metal window profiles and louvres which follow the vertical locations of the existing Berol House windows. The top floor will include a single storey glazed covering, with a curtain wall, which is set back from the edge of the building line. The proposed materials palette is sympathetic to the existing building. The existing windows will be removed and replaced with powder coated metal double glazed windows
- 5.21 The accompanying Design and Access Statement provides further details.

2 Berol Yard

- 5.22 2 Berol Yard has been designed by Allies and Morrison. The scale, proportions and character of the building blocks are slender and respond to the linear nature of Berol House. The massing and design of the building has been carefully considered to minimise heat gain and provide a high percentage of dual aspect homes. The proposal includes taller elements of the building to be located to the north-western edge of the Site, to ensure there is no impact to the Victoria Line Underground train line tunnel, running below the site.
- 5.23 The design proposes a materials palette which complements the surrounding context. The building will include a range of brick colours including shades of black, red, grey and green brick. The colours of the brick will alternate, each providing a monochrome design to provide a varied sense of height and scale, whilst making a positive contribution to the character of the skyline.
- 5.24 The development of the palette and the design of the 2 Berol Yard has been inspired by the surrounding context. The character and appearance of Berol House is referenced in the tone of the brick used for the eastern, closest block and in the building's fenestration. The ranging building heights will provide a stepped form providing a varied scale when viewed from the eastern elevation.
- 5.25 The accompanying Design and Access Statement provides further details on building's design.

Access, servicing and parking

- 5.26 The development will be car free apart from accessible bays. This reflects the Site's exceptional accessibility (PTAL 5-6a).
- 5.27 The proposed development will provide a total of 8 accessible/blue badge parking spaces and a further 15 spaces for any potential future need; if demand increased, 12 spaces would be provided within 2 Berol Yard and three would be provided within the public realm. Table 5.7 summarises how the proposed car parking provision will be allocated per building and per land use.

Table 5.7 Proposed Car Parking Provision

Building	Accessible Parking Spaces	Potential Future Spaces
Berol House	1 (commercial)	0
2 Berol Yard	7 (1 commercial/6 residential)	15 (residential)
Total	8	15

- 5.28 This approach has been discussed with Officers at LBH, with an evidence base and the level of provision provided in the Transport Assessment.
- 5.29 There will be an interim parking phase which is included within the Transport Assessment.
- 5.30 To prevent the use of the surrounding streets for parking, Ashley Road will be subject to a Controlled Parking Zone (CPZ) to prevent on street parking by residents and visitors to the area.
- 5.31 A total of 482 cycle parking spaces will be provided at 2 Berol Yard and Berol House. These will be provided at ground floor mezzanine level within 2 Berol Yard and ground floor level within Berol House. The cycle parking spaces will be for residents, visitors, and employees in the commercial and office units. Sheffield stands will be incorporated into the public realm for short term use. This provision is detailed in Table 5.8.

Table 5.8 Proposed cycle spaces in Berol Quarter

Building		Land Use Class	Proposed Spaces in line with London Plan (2021) Minimum Cycle Parking Standards	
			Long Stay (Within building)	Short Stay (Within public realm)
2 Berol Yard	A2-A5	Cafés and Restaurants (428smq)	4	18
	C3-C4	Dwellings (210 homes)	376	6
Berol House	A2-A5	Cafés and Restaurants (714smq)	4	20
	B1	Office (5,212smq)	44	10
Total			428	54

- 5.32 Within 2 Berol Yard, 27 (5%) of the cycle parking spaces will be accessible wider spaced stands located at ground floor. This will consist of 3 wide stands (6 spaces) and 12 Sheffield stands (24 spaces). The store will be secured by gates, covered, and well-lit. A cycle store is also proposed on the Mezzanine level and will be accessible via a cycle lift on the south-

- 5.33 eastern corner of the Site. The cycle lift is of dimensions suitable to accommodate all types of cycles. The mezzanine level will provide 140 two-tier stands (280 spaces), 26 Sheffield Stands (52 spaces), 7 wide stands (14 spaces).
- 5.34 Within Berol House, there will be 44 cycle spaces allocated to officer workers and 4 long stay spaces for retail use. These will be located within the ground floor cycle store located on the northern part of Berol House, accessed via Berol Walk and Ashley Road. The cycle store will consist of 18 (36 spaces) double stacker stands and 4 (8 spaces) wide stands.
- 5.35 There are also smaller cycle stores located at the southern end of Berol House. And within the public realm to provide the storage of 54 short stay spaces for public realm use and the development as a whole.
- 5.36 East-west pedestrian movements through the Site will be made via Berol Passage and Gessner Lane or Green Link. North-south pedestrian movements will be via Berol Walk. Access to the site will integrate with the pedestrian and cycle improvements on Ashley Road that are being delivered by LBH.
- 5.37 A delivery and servicing strategy has been prepared by WSP, which, follows the principles agreed in the previous planning approval. The servicing strategy addresses 2 Berol Yard and the redevelopment of Berol House. The comprehensive strategy will be managed and monitored by the Applicant's estate management company.
- 5.38 Servicing and deliveries (excluding refuse collection arrangements) to the buildings will be undertaken on the servicing bays on Ashley Road and Watermead Way. It is predicted that Berol House and Berol Yard are likely to generate around 96 deliveries per day of which only 4 will be made by HGV's and the majority, 92, by LGV's.
- 5.39 For Berol House, servicing vehicles for the retail units and office will be via the servicing bays on Ashley Road. The retail and office waste bin stores are located on the northern side of Berol House and will be accessed via an entrance on Ashley Road.
- 5.40 For 2 Berol Yard, retail waste and residential waste bin stores are located on the northern side of the building. Entrances to the bin stores are located on Gessner Lane, which allows the refuse collection vehicle to position itself with a 10m drag distance.
- 5.41 The Site will provide segregated waste storage, segregating into general waste and dry comingled recyclables.

Landscaping, public realm and amenity space provision

- 5.42 The landscape design across the site is being led by Churchman Thornhill Finch Landscape Architects who have designed the public realm across the ARSM over a number of years. The landscaping and public realm proposals are outlined in the Landscape Strategy section of the Design and Access Statement. Churchman Thornhill Finch's involvement demonstrates an ongoing commitment to quality and will ensure seamless integration of the new landscaping with the public realm works already delivered on site.

Public realm

- 5.43 The proposal for the public realm looks to complete Berol Quarter with a new square and completion of the Green Link. The proposed public realm compliments the ground floor

activity and uses at 2 Berol Yard and Berol House and creates a destination within the masterplan. The public realm has been designed to support flexible uses, accommodate temporary events and art installations, facilitate movement and support socialisation. The public realm will include tree planting, street furniture, planters and sculptural elements to integrate with the strategic west-east Green Link.

- 5.44 The square will be an intimate public space framed by the adjacent buildings, including Berol House and proposed tree planting. The square will be animated with a changing programme of events and pop-up artworks, being a 'moment' on the Green Link.
- 5.45 To the north of Berol Square will be Berol Walk, a vehicle-free space which will support retail spill out, provide cycle parking and be an arrival point for Berol House.
- 5.46 Gessner Lane will be resurfaced to create an attractive and permeable public space. The figure 5.9 below demonstrates the locations of the public realm interventions.
- 5.47 The Applicant has been involved with the Down Lane Park Community Design Group and had a meeting with the design team to discuss how the public realm and pedestrian movement will be coordinated.

Figure 5.1 Public Realm design interventions



Source: DAS prepared by Allies and Morrison, John McAslan & Partners and Churchman Thornhill.

Communal amenity space

- 5.48 Communal amenity space totalling 554.2 sqm will be provided at podium level, and at levels 18 and 30 of 2 Berol Yard. The landscape design of the roof terraces seeks to create a series of different types of spaces with different functions.
- 5.49 The proposals include an external garden space at podium level, communal garden terrace on top of Block A at level 18 and an internal community space located at level 30. The podium level and external 18th floor rooftop gardens will be decked with raised planters of informal plantings of grasses and perennials. Seating will be integrated with the planter edges. The highest outdoor roof (above the eighteenth storey element) will provide extensive wildflower content with the wildflowers growing beneath solar panels.
- 5.50 Internal community space will be provided at roof level 30. The space is enclosed and glazed offering views to the north, south and east of the Site. The room will provide

immediate access to an inset balconied area providing external amenity space to the northeast and southwest of the floor.

- 5.51 Berol House has been designed to incorporate a large private roof terrace which will be accessed by occupiers.

Play Space

- 5.52 In accordance with the requirements of GLA's Play and Informal Recreation Supplementary Planning Guidance, suitable play space provision is proposed. A child yield and play space calculation has been applied to the development's 210 homes and can be seen in the accompanying Design and Access Statement.
- 5.53 Play provision for 2 Berol Yard is located at the podium level and the upper roof terrace of 2 Berol Yard accessed only by the residents. The garden integrates 370sqm of play space for children aged 0 to 11 years old, comprising formal and informal play opportunities including, sand, balancing beams and boulders, a climbing structure and other play elements.
- 5.54 Play provision for over 11-year-old children is located in Down Lane Park which is a 194m walk from 2 Berol Yard. The proposed development provides considerable scope to create good levels of play space across the site.

Private amenity space

- 5.55 In addition to the communal amenity space created within the development, the homes within the proposed development will mostly be served by a dedicated private amenity space in the form of a generous balcony or roof terrace. Along the Watermead Way elevation of 2 Berol Yard, amenity space will be provided in the form of internalised space.
- 5.56 The balconies/internalised amenity space for each apartment ranges in size depending on the number of people within each unit, in line with or exceeding the following London Plan guidance. The development will include both projecting and recessed balconies depending on the unit's location.

Table 5.9 Private amenity space provision

Dwelling Size)	Private Amenity Space
Studio	5sqm
1-bed/2 person	5sqm
2-bed/3 person	6sqm
2-bed/4 person	7sqm
3-bed/5 person	8sqm
3-bed/6 person	9sqm

Energy and sustainability

- 5.57 The proposed development incorporates numerous measures to ensure the development is sustainable, energy efficient and reduces CO₂ emissions. The proposal meets the

requirements of Part L (2013) of the Building Regulations and the GLA energy hierarchy.

5.58

Energy efficiency will be maximised throughout the proposed development by measures including:

1. High specification fabric to be used to reduce the buildings energy consumption.
2. Passive design measures incorporated to reduce energy demand and the risk of overheating.
3. Connection to the proposed District Heat Network
4. All spaces will include 100% low energy LED lighting.
5. Addition of photovoltaic panels at roof level;
6. Berol House will include new windows with low U values
7. Solar shading to mitigate overheating
8. Planted roofs
9. The non-residential elements of the proposed development are expected to achieve as a minimum a BREEAM 'Very Good' rating.

5.59

The proposal exceeds the GLA 'Be Green' target of 35% reduction carbon reduction, providing an overall carbon emissions reduction of 66.9%.

6.0 **Planning policy considerations**

- 6.1 This section summarises the relevant national, strategic and local planning policy and guidance of relevance to the proposed development.

National Planning Policy

National Planning Policy Framework (NPPF) (2021)

- 6.2 The Planning Policy Framework (2021) was first published on 27 March 2012 and revised on 19 June 2019 and 20 July 2021. It sets out the Government's planning policies for England. It is a material planning consideration in the decision-making process. The NPPF requires Local Planning Authorities to adopt a positive approach to decision taking and to apply a presumption in favour of sustainable development.
- 6.3 Paragraph 8 sets out the following three dimensions of sustainable development; 'economic' in helping to build a strong, responsive and competitive economy, supporting growth, innovation and improved productivity and by identifying and coordinating the provision of infrastructure; 'social' in supporting strong, vibrant and healthy communities; and 'environmental' in protecting and enhancing our natural, built and historic environment.
- 6.4 The NPPF identifies a presumption in favour of sustainable development (paragraph 10). Plans and decisions should apply this presumption in favour of sustainable development, and where development proposals accord with an up-to-date-plan, they should be approved without delay (paragraph 11.c).
- 6.5 The NPPF outlines the importance for the effective use of land, stating that decisions should 'promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions' (paragraph 119). Paragraph 120 d) specifically 'promotes and supports the development of under-utilised land and buildings where this would meet identified needs for housing where land supply is constrained and available sites could be used more effectively'.

Planning Practice Guidance

- 6.6 In March 2014, the Department of Communities and Local Government (DCLG) launched the web-based Planning Practice Guidance (PPG) resource which sets out the planning policies for England and how these should be applied. With regards to decision making, the PPG is a material consideration in the determination of planning applications.

Statutory development plan

- 6.7 Section 38(6) of the Planning and Compulsory Purchase Act 2004 requires planning applications to be determined in accordance with the Statutory Development Plan, unless material considerations indicate otherwise.

The Statutory Development Plan for the proposed development comprises:

1. At a regional level, the London Plan (2021); and

2. At a local level the LB Haringey Local Plan consisting of:
- LB Haringey Local Plan: Strategic Policies DPD (2013 with alterations 2017);
 - LB Haringey Local Plan: Development Management DPD (2017);
 - LB Haringey Local Plan: Site Allocations DPD (2017); and
 - And the following relevant supporting document; Tottenham Area Action Plan Development Document (2017).

London Plan (2021)

- 6.8 The London Plan (2021) comprises the strategic component of the development plan and provides London wide policy and guidance. It promotes a sustainable mixed use development which optimises accessible brownfield urban land efficiently to create jobs and maximise new housing.
- 6.9 The London Plan's priorities are the delivery of employment opportunities and economic growth and maximising housing delivery while promoting high standards of design and environmental and social sustainability. It places a firm emphasis on growth, intensification and housing delivery in London's opportunity areas. The London Plan designates the Site within the Lee Valley Opportunity Area which has the potential to deliver 21,000 new homes and 13,000 new jobs by 2024. The also falls within the London Plan Tottenham Housing Zone, which is expected to deliver 1965 new homes and 560 affordable homes.
- 6.10 The following summarises key London Plan policies. A full policy matrix is contained within Appendix 3:
- 6.11 The London Plan seeks to make the best use of land through Policy GG2 (Making the best use of land). The policy emphasises to *"create successful sustainable mixed-use places that make the best use of land, those involved in planning and development must enable the development of brownfield land, particularly in Opportunity Areas, on surplus public sector land, and sites within and on the edge of town centres..."*.
- 6.12 Through Policy SD1 (Opportunity Areas), the plan promotes growth in these areas which are allocated as locations with significant development opportunity and capacity to accommodate new housing, commercial development and infrastructure.
- 6.13 The London Plan Policy SD7 (Town centres: development principles and Development Plan Documents) considers development proposals should take a town centres first approach, discouraging out of centre development of main town centre uses. The exception to this can be justified through the application of the sequential test for main town centre uses, which gives consideration to sites on the edge of town centres that are; well integrated with the existing centre, provide good local walking and cycling and public transport networks.
- 6.14 The London Plan sets 10-year targets for housing delivery. To ensure these targets are met Policy GG4 (Delivering the Homes Londoners Need) supports the need to optimise the delivery of housing delivery on suitable and available brownfield land and Policy H1 (increasing housing supply), requests the optimisation of brownfield sites and delivery of housing capacity identified within opportunity areas.

- 6.15 Policy D3 (Optimising site capacity through the design-led approach) further strengthens this and states that all development must make the best use of land by following a design-led approach. This helps ensure that capacity of sites is optimised. This approach formulates a design which can respond to the Site's context and capacity for growth and the existing and planned supporting infrastructure. Furthermore, the policy supports the delivery of higher density developments in locations which are well connected to jobs, services, infrastructure and amenities by public transport, walking and cycling modes.
- 6.16 Policy D9 (Tall buildings) sets out a series of locational requirements for the development of taller buildings. It states that tall buildings should be located in prominent and accessible locations in Opportunity Areas where their townscape, visual and heritage impacts are acceptable. They should relate well to the form, proportion, composition, scale and character of surrounding buildings, urban grain and public realm. Taller buildings should enhance the skyline and image of London and incorporate the highest standards of architecture and materials.
- 6.17 London Plan polices H4 (Delivering affordable housing) and H5 (Threshold approach to applications) seeks a strategic target of 50% of all new homes to be delivered as genuinely affordable. The threshold approach applies to major development proposals which trigger affordable housing requirements to deliver a minimum of 35% affordable housing. To meet the fast route approach, the applications must meet or exceed the 35% threshold with and align with the desired local unit mix.
- 6.18 London Plan, Policy H11 (Build to Rent) sets out the criteria required to qualify as a Build to Rent scheme. The policy encourages boroughs to take a positive approach to the Build to Rent sector, allowing it to better contribute towards the delivery of new homes. Where the proposal meets the criteria set out in part B of the policy, the affordable housing offer can be entirely Discount Market Rent, managed by a Build to Rent provider and delivered without grant. To follow the fast-track route, Build to Rent schemes should deliver 35% affordable housing. Of which at least 30% of DMR homes to be provided at an equivalent rent to the London Living Rent, with the remaining 70% at a range of genuinely affordable rents. Where this is not met, a viability tested route should be approached.
- 6.19 Policy S3 (Education and Childcare Facilities) within the London Plan, sets out policy to ensure there is a sufficient supply of good quality education and childcare facilities to meet the local demands. The policy resists the net loss of education facilities, unless it can be demonstrated there is no ongoing or future need.

Local Plan

- 6.20 The Local Plan sets out LBH's proposals and vision for the future development of the Borough. LB Haringey's development plan contains strategic policies, development management policies, site allocations and guidance in the form of the Tottenham Area Action Plan. As noted above, these are set out in four separate documents and are to be read alongside the London Plan. Where there are inconsistencies, the London Plan takes precedence. The following summarises key LBH Local Plan policies. A full policy matrix is contained within Appendix 3.

- 6.21 LBH is also in the process of preparing a new Local Plan, although this is at early stages of development. A draft Local Plan was expected to be published for consultation in Summer 2022. There have been no further updates.

Local Plan Site designation

- 6.22 The Site has the following designations as per Haringey Local Plan Site Allocations DPD (2017) and policies map, these are listed below:
- Site Allocation TH6: Ashley Road South
 - Growth area GA1 - Policies Map and Tottenham AAP
 - Tottenham Hale district centre (small part of the southern end of the site)
 - Local employment area: regeneration area - proposals for mixed-use employment-led development will be supported, where appropriate and there should be no net loss of employment floorspace [to be considered on a portfolio basis across the allocation].
 - Family Housing protection zone.
 - Within Tall building growth area (BH2) - Policies Map and LBH Development Management Plan (Fig 2.2)
 - Green Grid - along the southern edge of the site and east-west link will be provided to connect into Down Lane Park to the west and to the Lee Valley in the west.

LB Haringey Local Plan: Strategic Policies DPD (2013 with alterations 2017)

- 6.23 The Strategic Policies DPD sets out the vision and key policies for the future development of the borough up until 2026. The document outlines how the Council will address local and strategic development needs including housing, employment, leisure, and retail provision. The key policies are outlined below:
- 6.24 Policy SP1 (Opportunity Areas) focuses growth to the most suitable locations to maximise the supply of additional housing to exceed the borough's target 19,802 homes. Tottenham Hale has been identified as one of the borough's growth areas. Within these growth areas development will be expected to provide over 5,500 new homes and the majority of new business floorspace up until 2026, maximise site opportunities, provide links to the surrounding areas and provide the necessary infrastructure.
- 6.25 Policy SP2 (Housing) aims to provide homes to exceed LBH's housing target. New residential development should be designed having regards to the Local and London guidance and to maximise the delivery of accessible homes. Further to this, the policy iterates affordable housing shall be achieved, subject to viability. The provision of affordable homes should follow the local affordable tenure split of 60% affordable rent (including social rent) and 40% intermediate housing. However, the policy also states that the preferred affordable mix and unit and type of dwellings on individual schemes will be determined through negotiation and viability assessments and driven by local housing needs.
- 6.26 The Site is located within a Local Employment Area. In these locations Policy SP8 (Employment) offers a flexible approach to the uses on them. The policy supports the provision of employment floorspace. This policy has since been supplemented by policy

contained in the Tottenham Area Action Plan and Tottenham Hale District Centre Framework, which promote housing and commercial space within the Ashley Road South Masterplan.

- 6.27 Policy SP11 (Design) indicates that the Council will assess taller buildings against a number of criteria set out with the Tottenham Area Action Plan and the Development Management document.

LB Haringey Local Plan: Development Management DPD (2017)

- 6.28 The Development Management DPD gives effect to LBH's spatial strategy and the key objectives of the Strategic Policies Local Plan by supporting proposals that contribute to the delivery of sustainable development in accordance with the strategy and providing a clear framework and criteria-based policies against which planning applications are assessed. The key policies from this document are outlined below:

- 6.29 The DPD seeks that proposals to deliver excellence in development quality in accordance with policy DM1 (Delivering high quality design). The policy supports proposals which relate positively to the surrounding context, make a positive contribution to place, confidently address feedback from local consultation and provide inclusive and sustainable design and construction principles.

- 6.30 Policy DM9 (Management of the Historic Environment) proposes development conserves and enhances the significance of the heritage asset and its setting, relating to proposals affecting designated and non-designated heritage assets. Under the development management housing policies, DM11 (Housing mix), DM12 (Housing design and quality), and DM 13 (affordable Housing), LBH seeks the delivery of affordable housing in compliance with the Spatial Planning policies. DM12 proposes housing should be designed as tenure blind and accords with the London Plan space standards to provide high-quality, well-designed development. With regards to the provision of affordable housing, DM13 (Affordable Housing) outlines LBH will seek the maximum reasonable amount of affordable housing provision when negotiating on individual private residential and mixed-use schemes with site capacity to accommodate more than 10 dwellings, having regard to the Spatial Planning policy SP2 and the borough wide target of 40% provision of affordable housing. The policy outlines the council may seek to alter the tenure and/or the mix of affordable provision to assist in improving development viability and addressing the local needs.

- 6.31 The proposals will increase the delivery of employment floorspace. This is in support of policy DM37 maximising the use of employment land and floorspace and policy DM38 Local employment -regeneration areas. The policy highlights the importance for the intensification, renewal and modernisation of employment land within designated local employment areas.

LB Haringey Local Plan: Site Allocations DPD (2017)

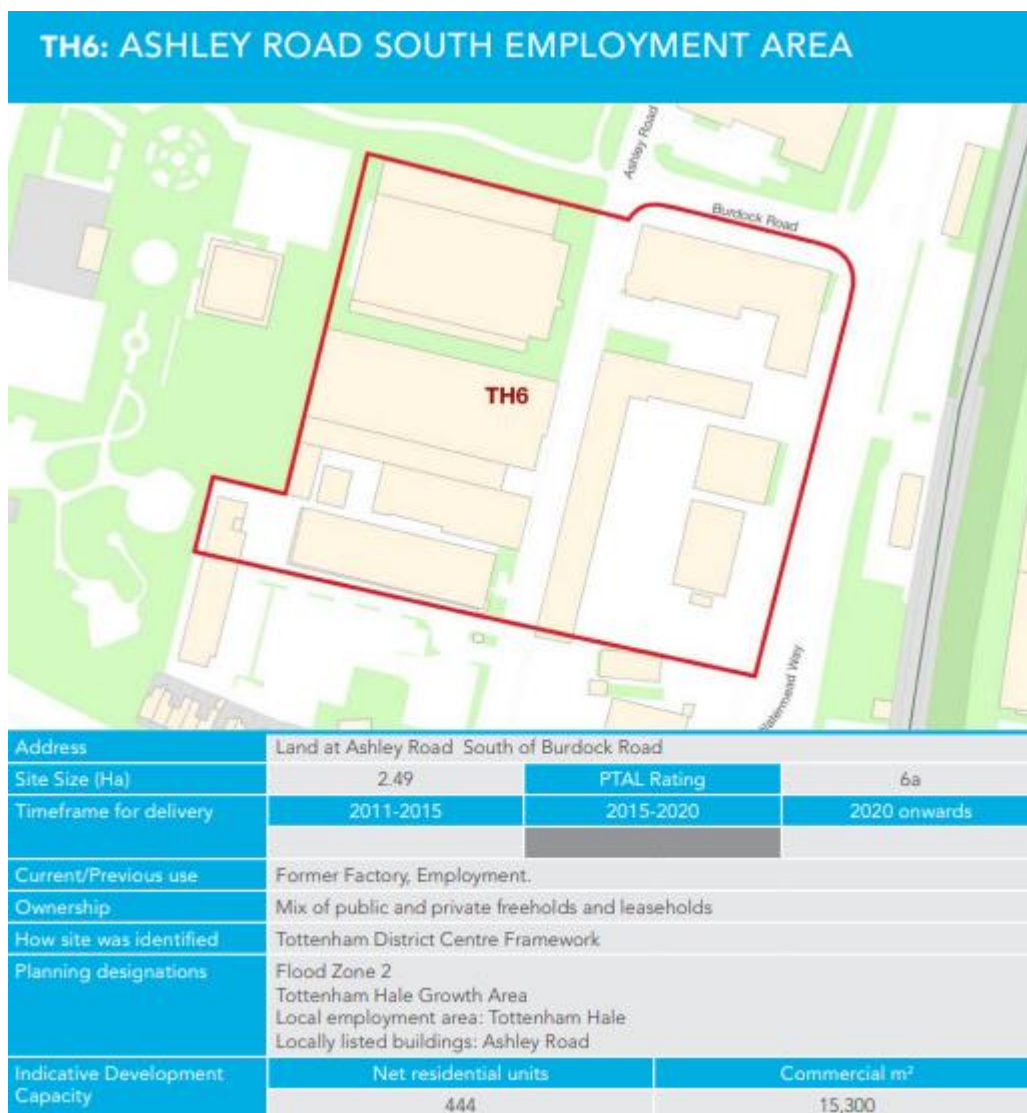
- 6.32 The Site Allocations DPD sets out the site allocations which will accommodate growth in LBH. The Site is allocated as TH6 on Figure 2.1. The document states that sites which are in Tottenham will be addressed in the Tottenham Area Action Plan (TAAP), see below.

Other relevant planning policy guidance

Tottenham Area Action Plan (TAAP) (2016)

- 6.33 The TAAP document ensures that the scale of development and change proposed for Tottenham to 2026 and beyond is positively managed and guided by a planning framework. It also ensures that investment decisions meet the aspirations of the local community and the Council for the area as a whole, as well as specific places and locations within it.
- 6.34 The AAP identifies land capable of delivering 10,000 new homes and 5,000 new jobs. It provides a legal basis for developments within the opportunity area. The document provides further detail, guidance and clarity to ensure the opportunities for improving the Tottenham Hale area are fully realised through the proposed developments.
- 6.35 Policy AAP1 (Regeneration and master planning) outlines all developments within the AAP area should come forward comprehensively and meet the wider objectives of the AAP to ensure there is an integrated approach to neighbouring developments, whilst optimizing development on the site. AAP6 further states expectations are for 'the highest density development to be located adjacent to public transport nodes and in Growth Areas' Policy AAP6 (Urban Design and Character Including Tall Buildings) sets out the design considerations within the opportunity area. The TAAP recognises the significant change planned within the growth area and seeks consistency to establish a new urban character. It provides guidance for design and character to comply with requirements set out within the Site Allocations, and the LB Haringey Development Management DPD. The policy includes further detail on appropriate locations for tall buildings to ensure the heights of new buildings respond to and help to define the surrounding character, whilst optimising opportunities for intensification and regeneration. Figure 4.2 of the policy identifies the Site as being suitable for tall buildings.
- 6.36 The Site is located in the Tottenham Hale Neighbourhood Area which seeks to incorporate higher density development as a key objective. The Site is allocated as TH6: Ashley Road South Employment Area. The site allocation provides detailed site requirements and development guidelines to ensure the site's potential is realised. The TAAP states that this forms a transition site between the denser District Centre and the surrounding residential area.
- 6.37 Ashley Road South (TH6) has an indicative development capacity of 444 homes and 15,300sqm of non-residential floorspace.
- 6.38 The Site Allocation TH6 is provided below.

Figure 6.1 TH6 Ashley Road South Site Allocation



Source: Tottenham Area Action Plan

Tottenham Hale District Centre Framework (2015) (Part 1) (Part 2)

- 6.39 This district centre framework acts as an evidence base to inform the TAAP to allow for the implementation of proposals for the Tottenham Hale District Centre. The framework helps provide an evidence base to form the strategy for development within the Tottenham Hale District.
- 6.40 The Tottenham Hale District Centre Framework (THDCF) provides design guidance and parameters for the Ashley Road South site (TH6). The vision for this area is that 'Ashley Road will be a vibrant mix of high-density businesses and homes. The Framework allocates an indicative quota of 438 dwellings (43,977sqm) for the ARSM site. It suggests that the wider site could deliver 146 jobs and up to 12,000sqm of commercial floorspace and 2,628sqm of retail, food and leisure.

6.41 The THDCF Section 4.1.1 (Building Height and Tall Buildings) identifies the Site as suitable for a mixed-use scheme of high-density businesses and homes.

6.42 The ARSM proposals have been strongly informed by the constructive guidance in the DCF.

Summary

6.43 National, regional and Local Planning policy is supportive of new residential led development which optimises delivery and makes the best use of land in this location.

6.44 Policy supports the provision of higher density development within this location given the site designations for growth, opportunity area allocation, tall building growth area and proximity to public transport, provision of employment and other supporting infrastructure to provide suitable development to meet the housing demands of the local borough.

7.0 Planning assessment

- 7.1 This section assesses the proposed development against the key planning considerations which should be taken into account during the determination of the application. This includes considerations in relation to the statutory development plan, other material considerations, pre-application discussions and the consultation process.

Principle of development

- 7.2 The principle of the proposed development is established by the national, regional and local planning policy. Both the London Plan and the Haringey Local Plan encourage the delivery of new homes and commercial space in this location. We discuss the principle of each proposed use further below.

Residential Use

- 7.3 policy GG4 (Delivering the Homes Londoners Need) of the London Plan and Policy H1 of the LB Haringey Local Plan encourage the delivery of new homes. Policy GG4 supports the need to optimise the delivery of housing delivery on suitable and available brownfield land, such as the Site.
- 7.4 The London Plan GG4 requires the creation of new mixed and inclusive communities with good quality homes and high standards of design to meet varying needs. The provision of homes in the form of BtR homes will ensure they are of high quality and of a suitable mix to the area.
- 7.5 Policy H11 (Build to Rent) of the London Plan is supportive of BtR development. The emerging developments in Tottenham are delivering a range of tenures and residential typologies. The table included in Appendix 1 demonstrates that the dominant components of the housing stock emerging in Tottenham Hale are conventional private sale, low-cost rent and intermediate homes which constitute c.87% of the 3,417 homes approved in Tottenham Hale during recent years. BtR accommodation (and accompanying DMR homes) account for c. 8% of the approved homes and the remaining 5% accounts for student accommodation within the area. Consequently, the introduction of c. 210 additional BtR homes will successfully complement and balance the established and emerging housing stock in Tottenham Hale.
- 7.6 The Applicant and partners Longharbour have recently completed the award winning The Gessner development at Berol Yard which provides 166 BtR and DMR homes. The Gessner provides a benchmark for the new BtR development in terms of quality and is illustrative of local demand for BtR homes. Like other BSD developments in the area, it also demonstrates the Applicant's commitment to delivering developments in Tottenham.
- 7.7 The Site is part of a wider site allocation promoting mixed use redevelopment including employment generating workspace and housing. The proposed housing component is supported by the site allocation and will contribute meaningfully towards pressing strategic and local need. The principle of delivering new homes at the site and the delivery of BtR housing here are firmly supported by the development plan. The development's housing component will contribute meaningfully towards LBH's low five-year land supply (3.87 years as confirmed in the Inspector's decision for planning appeal reference

APP/Y5420/W/21/3289690) and its overall housing need and the BtR homes will complement and strengthen the area's housing stock. These are material benefits supporting the scheme.

Replacement of approved college building

- 7.8 As outlined earlier, while the college building has planning permission, ADA was unable to fund or deliver the building and could not fulfil the contract with the Applicant to provide the facility. Notwithstanding this, the Applicant has undertaken a comprehensive and robust marketing exercise in attempt to identify an alternative occupant and operator for the approved building.
- 7.9 The accompanying report prepared by Knight Frank, provides further detail on the marketing exercise that was undertaken. It confirms that despite a marketing exercise for 32 months targeting 650 central London Agents, two presentations and an extension of marketing to ten life science providers, there was limited interest. In total there were 25 end users who engaged in the exercise and whilst they considered it a positive scheme, they did not consider the location to be their preferred choice as it does not have the amenities for students and users did not foresee future demand in this location. The life science operators confirmed they prefer to cluster in Cambridge or Kings Cross and prefer to target existing buildings. Further the bespoke nature of the college was not considered suitable for end uses who considered it would be too costly to deliver.
- 7.10 The report concludes there is limited appeal in the market for an educational use at this location and it poses a high risk being built out as an educational facility. Therefore, there is no prospect of the NCDS, or an alternative college facility being delivered at the site. Consequently, the 2 Berol Yard site needs to find an appropriate alternative use.
- 7.11 The college building designed for the NCDS has planning permission, however, the building has not been developed and is not in established use as an education or community facility. Consequently, policies which protect against the loss of community and education facilities are not directly relevant to the Berol Quarter - including Policy S3 (Education and Childcare Facilities) of the London Plan 2021 and Policy DM49 of the LB Haringey Local Plan. The land use situation at the Berol Quarter site relates to the loss of an opportunity to provide an academic facility for which no operator can be identified, rather than the loss of a functioning operational college – an important distinction in policy terms.
- 7.12 The Applicant recognises the role the proposed college facility had in the ARSM and in Tottenham Hale as a whole. The college was designed as a bespoke, iconic building seen as a local landmark at the heart of Tottenham Hale - a destination and a generator of activity and vibrancy in the district centre. Through delivering the restoration/extension of Berol House, including the creation of activity and permeability at ground level, and by introducing a landmark mixed-use building at 2 Berol Yard, the same benefits can be achieved but within a funded and deliverable scheme.
- 7.13 For these reasons, there is demonstrably no likelihood of an academic facility being delivered at the site; whereas the high-quality mixed-use development proposed will complement neighbouring developments, will yield multiple local benefits and is firmly supportable in policy terms.

Community and commercial use

- 7.14 The proposed community use in this location will be located within the first floor of 2 Berol Yard. The community space will front onto the public square, with activities encouraged to spill out and activate the space. As set out in the accompanying retail strategy prepared by the Applicant, it is proposed the space will be occupied by Made By Tottenham who will use the space to allow local businesses and entrepreneurs including the makers and creators who occupy Berol House to show case their products. The space will act as hub for local businesses and local people to meet
- 7.15 The proposed commercial use in this location is already established through planning permission HGY/2017/2044. There is existing commercial space at Berol House and this will be improved and increased as part of the proposed development. 2 Berol Yard will also provide new retail and commercial space.
- 7.16 The Retail Strategy prepared by Berkeley Square Developments Limited which accompanies this application sets out the community and commercial strategy with the proposed development. The assessment identifies the demographics and needs of the surrounding context. With regards to the commercial strategies and social community development. The scheme delivers both housing and an enhanced retail and employment space for local residents to utilise.
- 7.17 Policy SD7 (Town centres: development principles and Development Plan Documents) of the London Plan and policies DM41 (New town centre development), DM37 (Maximising the use of employment land and floorspace) and DM45 (Optimising the use of the town centre land and floorspace) of the LB Haringey Local Plan support the provision of new commercial space in this location, providing there are a range of sizes that enable future flexibility. The proposed development will provide a range of uses and sizes which will be adaptable to ensure future flexibility and is therefore planning policy compliant.
- 7.18 The proposed development will also incorporate active street frontages to satisfy Policy SD6 (Town centres and high streets) of the London Plan and Policy DM44 (Neighbourhood parades and other non-designated frontages) of the LB Haringey Local Plan.

Affordable housing

- 7.19 The proposed development will deliver 35% affordable homes by habitable room in accordance with Policy H11 (Build to Rent) of the London Plan. Policy H11 further states that to follow the fast-track viability route, as well as providing 35% affordable housing by habitable room, which can be solely DMR products provided 30% is at London Living Rent.
- 7.20 The proposed development will meet the above requirements, as demonstrated in Section 5 of this planning statement.
- 7.21 It will provide an uplift of 54 affordable homes above the extant planning permission (HYG/2017/2044) and will add to the overall number of affordable homes across Tottenham Hale. It is therefore considered acceptable in the context of policy requirements and objectives relating to affordable homes.

Proposed dwelling size mix

- 7.22 The proposed dwelling size and mix has been developed to provide a good mix and balance of residential homes having regard to local need and site-specific characteristics. Along with family sized homes, a good blend of entry level accommodation for smaller households will be provided. The proposed development will provide a suitable amount of one-bedroom and two-bedroom homes to play an important role in meeting housing need across the Borough and which reflects the Site's proximity to a major transport node. The dwelling mix reflects 2 Berol Yard's location and role in the masterplan to complement and balance with the wider ARSM.
- 7.23 The intention as part of the wider ARSM was to provide a higher level of family housing within the western part of the masterplan site, given its close proximity to Down Lane Park and a higher proportion of smaller homes in the eastern part of the ARSM.
- 7.24 Given the Site's location within the Tottenham AAP, its proximity to Watermead Way, its proximity to the District Centre and Tottenham Hale Station, the Site is suited to a mix of homes which are skewed towards smaller sized homes. The proposed mix of 21 studios, 47 one beds, 114 two beds and 28 three beds is therefore acceptable. This has been accepted with Officers through the pre-application discussions.
- 7.25 The proposed development will offer good housing choice and the proposed accommodation will be mixed and balanced by size, tenure, and typology.
- 7.26 The proposed development is therefore supportable in the context of London Plan Policy H10 (Housing size mix), Policy SP2 (Housing) in the adopted Local Plan, and Policy DM11 (Housing mix) in the adopted Haringey DPD.

Design, layout, height and scale

- 7.27 London Plan (2021) policy D4 (Delivering good design) and LBH Local Plan policy DM1 (Delivering high quality design), policy AAP6 (Urban Design and Character including Tall Buildings) require developments to be of a high standard of design and in keeping with the scale and character of existing development and its setting. Development proposals should be sensitive to the setting, townscape and historical context. They must respect the scale, mass, form and grain of surrounding development and the connections to it.
- 7.28 The proposed development has been designed in accordance with the relevant planning policies on design, layout, height and scale. The two key elements of the proposed development, Berol House and 2 Berol Yard, connect through well designed public space including the new public square. The Retail Strategy prepared by Berol Quarter Limited, details the permeability of the overall proposed development and how each element has been designed to maximise pedestrian throughfare, pedestrian interest and to activate this part of Tottenham. The design of the proposed development has carefully considered the layout of each building to ensure connectivity and activation, the height to act as a marker at various locations across Tottenham, and the design for visual interest. The scale of the proposed development fits within the surrounding area. Each building is considered in more detail below.

Berol House

- 7.29 Berol House is a locally listed building and makes a positive contribution to the local townscape. The building, however, forms a long, low-lying structure orientated north-south on the eastern side of Ashley Road. It currently fails to animate the street scene, creates a barrier to east-west movement between the two halves of the masterplan site and is of a different scale to the new buildings proposed across the remainder of the masterplan. As the wider area has developed, Berol House has lost some of its prominence.
- 7.30 The design and extension of this building have been developed to enhance the prominence and permeability of the building. The permeability has been improved through the creation of the undercroft pedestrian route through Berol House at ground floor (to be known as Berol Passage). This will help create access from Ashley Road to Watermead Way and to Tottenham Hale Station. This design consideration accords with the London Plan policy D2 (Infrastructure requirements for sustainable densities), through the consideration of the Site's connectivity and improvements to accessibility by walking in and around the site in accordance with Local Plan policies policy SP11 (Design), and within the site allocation TH6 site requirements.
- 7.31 The massing and form of the proposed extension will ensure the addition reads as a subsidiary to the host building through contrasting yet complementary materials. The new materials will act to delineate the new extension from the main building and to enhance the existing building.
- 7.32 Two floors of the main extension of the building will follow the form of the existing building, whilst the top floor will step in at the north and south to further delineate the new extension from the existing building and to create a lightweight addition. The massing to the rear of the building will be reduced, through the removal of the existing stairwell. As per London Plan policy HC1 (Heritage conservation and growth) and the Tottenham AAP policy APP5 (Conservation and Heritage), the bulk and massing of the proposed extension positively and sympathetically responds to the character and significance of the heritage asset. The extension will improve the design of the building creating a distinct linear form, in accordance with London Plan policy D9 (Tall buildings), through responding positively to the existing rhythm of development.
- 7.33 The principle of the extension has been previously established through the extant permission (HGY/2017/2044) on the Site. London Plan policies HC1 (Heritage Conservation and Growth), D3 (Optimising site capacity through the design-led approach), D4 (delivering good design) and policy D9 (Tall Buildings), and Local Plan policies DM1 (Delivering High Quality Design, SP11 (Design) and Tottenham AAP policy AAP6 (Urban design and character including tall buildings) have all been considered throughout the design development of the scheme, with particular regard when considering the materiality of the proposed extension to the building.
- 7.34 The materiality of the proposed extension provides a sympathetic feature in respect of the existing building palette, in accordance with the aforementioned policy. The materiality is high quality and materials have been chosen to not only sympathise with the existing building but to enhance it and to respond to the character of the wider surroundings, including the new 2 Berol Yard building. The proposed materials are highly sustainable and have been chosen to ensure Berol House is able to meet BREEAM Level Very Good.

- 7.35 As demonstrated above the proposals accord with both the Local and London Plan policies. The development provides a positive intervention through the sympathetic contemporary introduction of the roof extension and the opening of the ground floor access.

2 Berol Yard

- 7.36 2 Berol Yard has been designed to respond to its immediate context. The layout follows a logical approach to addressing the Gessner to the north, Watermead Road to the east, and 1 Ashley Road to the south and Berol house to the west. The layout also responds to the Victoria Line which runs underneath the Site to the south east corner - limiting new loads above this part of the Site. The constraints at the ground floor have resulted in the building becoming a tall building to ensure the Site is able to be optimised.
- 7.37 Further up the new building the layout switches to respond to the residential accommodation at the Gessner and the 1 Ashley Road buildings and create a high-quality living environment for new residents at the building. The physical constraints of this part of the Site limit the options available in terms of new layouts. Notwithstanding, the proposed layout is an innovative solution to ensure the Applicant is able to optimise the development of the Site, as required through policy D3 of the London Plan.
- 7.38 The new building varies in height up to a maximum of ground floor plus 29 storeys and lift overrun within core. As per the London Plan policy D9 (Tall buildings), the building qualifies to be assessed as a tall building, given the proposed building is above the threshold height of 6 storeys (or 18m in height). Policy D9 limits the location of tall buildings under Part B, to areas which are defined in Local Plans. As noted in the policy section of this Planning Statement, the Site is located within an area identified as being suitable for tall buildings in the Tottenham AAP. It is therefore acceptable in principle in this location.
- 7.39 Policy D9 part 3 therefore applies. This part of the policy seeks an assessment of the scheme to exemplify the suitability of the tall building within this location. It does this through an assessment of the justification for the proposal against the wider enhancements and delivery of infrastructure on offer and the detailed design and mitigation measures in response to the development of the tall building. It specifically seeks that development proposals address visual impacts including, long range views, mid-range views, and immediate views, the functional impact of the building, and the environmental impact of a building. These policy matters have been taken into consideration from the offset of the scheme design development and the proposed development has responded to each criteria at every stage of the pre-application process.
- 7.40 The Local Plan policies DM6 (Building heights) and AAP6 (Urban Design and Character including Tall Buildings) within the Tottenham AAP, sets out the local requirements for the assessment of tall buildings. The policy requirements mimic those presented within the London Plan.
- 7.41 A full detailed assessment of Policy D9 against the proposed scheme is set out within the table provided within Appendix 4 of this planning statement.
- 7.42 It is clear from the assessment that the proposed development is suitably located within the designated local tall building zone and the proposal sits comfortably within the existing cluster of tall buildings within the immediate surrounding context. The new building complements the skyline, the DCF wave and the existing cluster of tall buildings providing a

stepdown in heights to help provide a suitable transition between the denser district centre and the surrounding residential context, as part of the wider TAAP site allocation and DCF design considerations. It creates a marker to the Green Link and joins the tall buildings at One Station Square and Hale Village to form a cluster which marks the Tottenham Hale station at the ground in the middle.

- 7.43 The scheme has been designed as per London Plan policy D9 (Tall Buildings) and D3 (Optimising site capacity through the design-led approach) taking the constraints of the Underground Victoria line tunnel running under the south eastern corner of the Site, respect to the neighbouring and emerging developments and the opportunity to define the Green Link and its surrounding routes and spaces. The design of the scheme has taken the impacts Daylight Sunlight and Microclimate conditions from current and emerging proposals into the design development of the scheme. Whilst simultaneously responding to the surrounding context with regards to neighbouring heights, design and materiality.
- 7.44 The architectural character of 2 Berol Yard has been influenced by the surrounding development, both current and emerging. The materiality pays tribute to the historic industrial context whilst sympathetically responding to the design and colour palette of the immediate surroundings. Each of the buildings provides a varied brick tone, providing a contrasting uniform design. The design of the brick provides a design feature, whilst ensuring the development uses a sustainable material, which will require little to no maintenance, ensuring the architectural quality of the building will remain exemplary throughout its lifespan, according to the London Plan policy D9 (Tall Buildings).
- 7.45 The detailed metalwork to the windows of the building is consistent and responsive to the surrounding context, including to Berol House. Further to this, the detailed bars also provide solar shading. Adjustments have been made to each facade allowing the shading to respond to the varying solar impacts to each facade of the development, taking both Local and London plan policies, D9 (Tall buildings) and DM6 (Building heights) into consideration.
- 7.46 The visual impact and an assessment of the views experienced of the building is discussed in further detail later in the townscape section. The functionality of the building is considered throughout this section. It is clear that the proposed building meets the criteria of Policy D9 and should be supported.

Heritage

- 7.47 A comprehensive Heritage Impact Assessment (HIA) produced by Lichfields has been submitted to support this planning application.
- 7.48 The HIA assesses the individual designs of Berol House and 2 Berol Yard and the relationship between these two buildings. The HIA further assesses the impact of the proposed development on the significance of Berol House and its setting.
- 7.49 The HIA states that the setting of Berol House is much-altered and no longer materially contributes to its significance. It adds that the addition of 2 Berol Yard would be seen as a positive response to the historic environment with no adverse impact on significance. This is partly due to 2 Berol Yard preserving the visibility of Berol House's long east facing elevation within the immediate townscape and 2 Berol Yard being designed to echo Berol House's architectural appearance and respond carefully to this historic context. Overall, the

HIA confirms that the proposed development enhances and better reveals the significance of Berol House and that this positive effect should be taken into consideration within the overall planning balance.

- 7.50 The HIA concludes that the two-storey residential roof extension on Berol House will be a contemporary addition which will be both sensitive to the original design and will give prominence and a distinctive identity to this historic asset in Tottenham Hale. The design of the lower floors of the building create a cohesive shared streetscape between the two buildings where 2 Berol Yard and Berol House would both address the new public spaces of Berol Walk and Berol Square. It is therefore demonstrated that the proposed development conserves and enhances the significance of Berol House and its setting. The proposed development is considered to have no adverse impact on the setting of Berol House and further constitutes high quality design which responds positively to the historic environment and ensures the local distinctiveness of Berol House is preserved and enhanced.
- 7.51 The proposed development is therefore compliant with s.66(1) of the Planning (Listed Buildings and Conservation Areas) Act 1990 (“the 1990 Act”); London Plan Policy HC1; Local Plan policies SP12 (Conservation) and policy DM9 (Management of the historic environment).

Townscape

- 7.52 A comprehensive Townscape and Visual Appraisal (TVA) produced by Lichfields has been submitted to support this planning application.
- 7.53 The TVA assesses 17 representative views which were agreed with LBH during the pre-application process. The views are based on the previously assessed views agreed between the Applicant and LBH under permission HGY/2017/2044. The townscape effects have been considered at both a site-wide and character area level. The TVA has been prepared in accordance with the London Plan, Local Plan Policy SP11 (Design), Policy DM1 (Delivering high quality design) and Policy DM9 (Management of the historic environment).
- 7.54 The TVA considers that the proposed extension to Berol House and the construction of 2 Berol Yard and the associated public realm, to overall positively contribute to local distinctiveness in long, medium, and local range views. The proposed buildings both represent high quality design with attractive and distinctive elements that would play a positive role in the local and wider townscape. The TVA further considers that there would be a range of improvements to the permeability, legibility and public realm of the Site and the way it connects to the wider area.
- 7.55 The TVA considers that 2 Berol Yard can be seen in conjunction with an emerging townscape of taller buildings around Tottenham Hale that reflect the importance of the location in the spatial hierarchy of the wider area. 2 Berol Yard building provides orientation and wayfinding benefits to Tottenham Hale Station through the use of distinctive green brickwork on the lower block and over longer views, being an attractive addition in the skyline. In addition, 2 Berol Yard marks Ashley Link, Berol Square, and the future bridge link in views from the local and wider area. The stepping and slender built form and varied materials of 2 Berol Yard would complement existing and proposed buildings within the cluster. The TVA therefore concludes that 2 Berol Yard responds to the

overall masterplan and has a positive role within the wider townscape that would not harm the visual amenities of people in the surrounding area. This results in the reinforcement of an emerging sense of place and the new identity of Tottenham Hale.

- 7.56 Overall, the visual impacts of the proposed development are considered acceptable in line with national, regional, and local planning policy.

Accessibility and inclusive design

- 7.57 The proposed development has been designed in accordance with the principles of inclusive design. The residential homes, commercial accommodation and landscaped public realm will enable level access and convenient movement in terms of the approach to the buildings and internal circulation. The needs of disabled occupants and visitors have been integral to the design process.
- 7.58 The proposal is compliant with the London Plan policy D7 (Accessible housing). Of the 210 homes, 90% will be in accordance with Part M (2) of Approved Document M of the Building Regulations and 10% will be in accordance with Part M4(3) as wheelchair adaptable homes, see section 5 of this planning statement and the accompanying DAS for further details.
- 7.59 Level pedestrian access will be provided to the residential and commercial units in and around the Site within 2 Berol Yard and Berol House in accordance with requirements of Building Regulations, Part M.
- 7.60 The proposed development will provide 7 accessible spaces with the provision of a further 15 accessible spaces should the future need arise in line with policy T6.1 (Residential parking) of the London Plan. The spaces have been designed in accordance with requirements of Building Regulations, Part M and design guidance in BS8300vol.1, to ensure they meet the requirements of an accessible space.
- 7.61 The provision of the accessible parking spaces has been assessed and is evidenced within the accompanying Berol Quarter Transport Assessment prepared by WSP and has been agreed with officers from the GLA and LBH during the pre-application process.
- 7.62 The proposed development is therefore acceptable in terms of accessibility and will provide an inclusive environment for all occupants in accordance with London Plan policies D7 (Accessible Housing), T6 (Car Parking), T6.1 (Residential car parking), T6.5(non-residential disabled persons parking) Local Plan policy SP2 (Housing). Further details of the scheme's access strategy are provided within the submitted DAS.

Residential amenity and standard of living for residents

- 7.63 The residential amenity and standard of living of the residential element of the proposed development (i.e., 2 Berol Yard) has been a key design consideration throughout the design stages.
- 7.64 The accompanying drawings and the DAS demonstrate that 2 Berol Yard is a high-quality proposal that will provide good residential amenity and a good standard of living for residents.
- 7.65 As seen in Section 5 of this planning statement, the drawings and within the DAS, the floor spaces of residential homes are generously sized with floorspace in accordance with, and

frequently in excess of, the standards in the London Plan and Mayor of London's Housing SPG (March 2016).

- 7.66 The layouts of the new homes maximise access to daylight in living, dining, working and sleeping areas with the bathrooms, storage and utility areas being located in the deeper parts of the plan. This arrangement, alongside repeated floors, allows for the stacking of uses to safeguard against neighbouring noise impacts. This is promoted by Policy D6() of the London Plan and in the Mayor of London's Housing SPG (March 2016).
- 7.67 All layouts have been designed to ensure that intervisibility between the proposed homes and neighbouring dwellings in adjacent buildings are minimised to provide privacy. There is approximately 12 metre separation distance to the closest point to the Gessner building which is considered acceptable on the basis that any north facing openings are secondary windows to living spaces and those facing the north-east are angled away, increasing the distance as the elevation runs southeast.
- 7.68 The majority of the homes will be dual aspect and the remaining single aspect homes will be enhanced through additional windows facing onto their recessed balconies. This approach is considered acceptable in line with Policy D6(Housing quality and standards) of the London Plan which requires proposals to maximise the provision of dual aspect dwellings and normally avoid the provision of single aspect dwellings. The maximum dual aspect homes unless there are circumstances. The approach to providing some single aspect homes is considered appropriate given the Site constraints. Single aspect dwellings have only been provided where it is considered a more appropriate design solution to meet the requirements of Part B in Policy D3 (Optimising site capacity through the design-led approach).

Daylight and Sunlight

- 7.69 A Daylight Sunlight (DLSL) Assessment has been undertaken for the proposed development in accordance with the guidelines set out in the BRE Report (Second Edition). The DLSL Assessment accompanies the submission and provides an in-depth assessment and analysis of the proposed development. The DLSL report demonstrates that the proposed development will allow for the neighbouring properties to continue to have compliant levels of natural light, with the exception of some minor transgressions. The results of the assessment have shown that all neighbouring properties will see minimal or no modifications to their current amenity. Therefore, the proposed development accords with Local Plan policies SP2 (Housing) and DM12 (Housing design and quality) in terms of protecting the existing residential amenities.
- 7.70 Additionally, analysis of the DLSL of the internal space within the proposed scheme concludes that the daylight and sunlight amenity is above expectations with the majority of rooms seeing compliance with the BRE Report guidance. The proposed development therefore accords with the London Plan policy D6 (Housing quality and standards).
- 7.71 The proposed scheme will not give rise to any materially unacceptable daylight, sunlight and overshadowing effects in the context of the Site in accordance with the requirements of London Plan (2021) Policy D6 and is therefore acceptable in national guidance and local planning policy terms.

Summary of residential amenity

- 7.72 Overall, the proposed development provides high quality residential accommodation and internal and external amenity space which promotes resident's health and wellbeing. The proposal therefore accords with London Plan Policy D6, Policy SP2 in the adopted Local Plan and Policy DM12 in the adopted Haringey DPD.

Amenity and playspace

Private amenity

- 7.73 The proposed development includes balconies for all new homes, and each will be sized to suit unit types, with larger homes having larger balconies in line with current London Plan requirements. The balconies will also be inset to give a degree of privacy and protection from prevailing winds for residential comfort as required with Local Plan policy DM12 (Housing design and quality).
- 7.74 London Plan policy D6 (Housing quality and standards) outlines that a minimum of 5 square metres of private outdoor space should be provided for 1-2 person dwellings and an extra one square metre should be provided for each extra occupant.
- 7.75 Each dwelling in the proposed development features a private balcony or amenity space which meets the relevant space standards for the unit size. The private amenity space across the Site is therefore policy compliant.

Communal amenity

- 7.76 As set out within section 5 of this planning statement, communal spaces have been provided at multiple terraces and in the form of a garden at the podium level.
- 7.77 The spaces provide ample multipurpose space for residents to use and are key areas for bring a mix of communities together and to aid the wellbeing of residents. The areas have been carefully landscaped to add quality and to aid biodiversity. The microclimate conditions at roof level have been assessed within the accompanying Wind Microclimate assessment prepared by WSP.
- 7.78 Internal communal amenity space is provided within Block D at level 30. The enclosed glazed area is well ventilated and provides immediate access to sheltered terraces. The communal spaces can easily be accessed by residents within 2 Berol Yard and is suitably positioned providing extensive views of the surrounding area. The provision of communal amenity space within Berol Quarter accords with the London Plan policy D6 (Housing quality and standards).

Play space

- 7.79 Berol House is a building with entirely commercial and retail uses, therefore has no play requirements.
- 7.80 The play space provisions for 2 Berol Yard are based on the calculations set out in the GLA Shaping Neighbourhoods Play and Informal Recreation SPG 2012.
- 7.81 The proposed development includes a total play provision of 370sqm of play space for children aged 0-11 years old. This will be located at the podium level of 2 Berol Yard and the

upper roof terraces and will be solely accessible by residents within 2 Berol Yard, the play space will include the provision of both formal and informal play space features which meet the requirements set out in the play space calculator. This is compliant with the requirements set out within the GLA play space SPG and Local Plan policy SP13 (Open space and biodiversity).

- 7.82 In accordance with the London plan policy SP4 (Play and informal recreation), play provision for children ages 11+ will be located in Down Lane Park. This is on the basis that it is a 194m walk from the building to the park, which is within the requirement for a distance of a maximum travel distance of 400m as set out in the GLA Shaping Neighbourhoods Play and Informal Recreation SPG 2012 guidance. The short distance to Down Lane Park, means that children can easily access the required play space.

Landscape and the public realm

- 7.83 The proposed development seeks to create improved permeability through the Site by strengthening the Green Link, through the provision of a new square and the enabling of a potential future Watermead Way bridge. The proposed development also includes the usable biodiverse communal rooftop spaces for residents and workers to use.

Public realm

- 7.84 The public realm strategy includes a series of benefits to the public providing improvements to the ease and access of pedestrian, cycle and vehicular movement (limited to accessible parking, refuse collection, servicing and emergency access only) in and around the site, whilst simultaneously facilitating movement from the transport interchange to the southeast to Down Lane Park. Further to this, the links provided through the implementation of Berol Walk and Berol Link provide enhanced permeability within and around the Site. This strategy is supported by both the London and Local plan policies T1(Strategic approach to Transport) and SP7 (Transport).
- 7.85 The proposed development provides an integrated approach to the delivery of public realm interventions which link and deliver proposals as part of the wider Ashley Road South masterplan.

Berol Square

- 7.86 The provision of an enlarged public square, this is promoted within the London Plan through policy G4 (Open space), encouraging the creation of publicly accessible open spaces. This is further supported by the Local Plan policy DM1(Delivering high quality design). The scheme accords with both Local and London Plan policies through the design and provision of the square. It has been designed to create an open space fronting 2 Berol Yard, and the approach from Ashley Road, making both easily visible and easily accessible through the movement corridors of the Green Link and Berol Walk.
- 7.87 In addition to this, the public square provides an active use at ground floor making the access to the 2 Berol Yard safe and complying with secure by design principles. Landscaping and planting around the square, to reinforce legibility, through aligning with the desire lines and edge around defining the confines of this space.

- 7.88 The Applicant has proposed to include a contribution and space for public art in the Berol Square, which will link with the community use in 2 Berol Yard

Urban greening and biodiversity

- 7.89 The proposed development has been designed in accordance with London Plan policy G1 (Green infrastructure) and G5 (Urban Greening) which outlines major developments are to contribute to the greening of London. The proposed development includes urban greening as a fundamental element of the design, through high quality landscaping and nature-based drainage systems. The landscaping design enhances local biodiversity through increasing areas of urban greening and wildlife refuges.
- 7.90 The policy states, all major developments should aim to achieve an appropriate Urban Greening Factor (UGF), with a target score of 0.4 for developments that are predominantly residential. The urban greening factor score for the proposed development is 0.314 which is considered an acceptable value given the proposed mix of uses across Berol Quarter.
- 7.91 The opportunities for planting in the public realm is very limited, and increased planting measures would conflict with secure by design principles, wayfinding and would limit the use of these spaces. The design therefore has sought to maximise the opportunities presented by amenity spaces throughout the proposed development.
- 7.92 Urban greening measures have been maximised on the 2 Berol Yard site with significant areas of green roofs and a planted podium. These include species which attracting increased biodiversity, enhancing the contributions to wildlife and ecological habitats within the urban environment, in accordance with London Plan policy G6 (Biodiversity and access to nature) and Local Plan policy SP13 (Open Space and Biodiversity).
- 7.93 We consider that the benefits of providing a more usable, safe and active use of the public realm outweighs the minor shortfall in meeting the urban greening target score. The provision of the public square supplements the need for a flexible commercial, community and cultural activity space within the local area. The Square provides further added benefits and provides additional public benefits, enhancing the ASRM masterplan. It should be noted that the London Plan policy G5 (Urban Greening) that the 'Mayor recommends a target score of 0.4 for developments that are predominately residential, and a target score of 0.3 for predominately commercial development'. These are recommended levels set out by the mayor and the Berol Quarter proposal provides an equal balance of commercial and residential development, therefore this score is deemed as acceptable for this proposal.

Transport, parking and servicing.

- 7.94 A Transport Assessment, Residential and Commercial Framework Travel Plan and a Delivery and Servicing Plan have been produced by WSP and submitted to support the application.

Car parking

- 7.95 Given the Site's excellent public transport (PTAL score of 6a- Excellent), and the prospective arrival of Crossrail 2, the proposed development will be car free. This is supported both by the London Plan policy T6 (Car parking) and the Tottenham Area Action Plan (site allocation TH6).

- 7.96 2 Berol Yard includes the provision of 8 accessible car parking spaces (one for retail and 6 for residential), with a further 15 accessible residential parking spaces designed into the scheme, should the demand for additional accessible spaces be required. Berol House provides one accessible parking space.
- 7.97 The proposed development will also provide six (active) slow electric vehicle charging points for accessible residential use and two (active) fast charging points for the commercial accessible parking spaces
- 7.98 The scheme therefore accords with the London Plan policies T6 (Car parking), T6.1 (Residential parking), T6.2 (Office parking), T6.3 (Retail parking) and T6.5 (non-residential disabled persons parking). Further to this, the provision of car parking spaces also accords with the Local Plan policies SP7 (Transport), DM32 Parking and the Tottenham AAP (TH6) site allocation requirements.
- 7.99 There is a requirement to provide temporary car parking for those commercial tenants in Berol House who have a right to park under existing leases. The temporary car park has been designed to be removed and replaced with additional retail spaces, including a new unit facing Watermead Way.

Cycle parking

- 7.100 The tables set out within the accompanying Transport Assessment outlines the policy requirements and provision for both long and short cycle parking provision for Berol House and Berol Yard. The proposed development provides a total of 482 cycle parking spaces.
- 7.101 As demonstrated within this report the proposed level of provision will be in accordance with London Plan standards and policy T5 (Cycling).
- 7.102 Taking account of the Site's exceptional (and improving) public transport accessibility, the scheme's restraint-based approach to car parking, its high level of cycle parking provision and the enhancement of the pedestrian environment, the development will encourage sustainable travel behaviour amongst all residents, employees and visitors. This will be further encouraged through the adoption of the Framework Travel Plan prepared by WSP.

Pedestrian access and servicing

- 7.103 By enabling the undercroft pedestrian route through Berol House (known as Berol Passage), and the pedestrian boulevard (known as Berol Walk), located along the eastern side of Berol House and the Green Link to the south of Berol House. The permeability across the Site will be significantly improved.
- 7.104 The design improvements also include improvements to for pedestrian movement and access in and around the Site. Including east-west pedestrian movements through the Site via Berol Passage and Gessner Lane or Green Link. North-south pedestrian movements via Berol Walk. The accesses for the Site will integrate and fall on desire lines with the pedestrian and cycle improvements on Ashley Road that are being delivered by LBH. The integrated approach takes into consideration the emerging developments and proposed works around the Site, whilst improving the access and provision within the Site area.
- 7.105 All servicing (excluding refuse collection arrangements) of the buildings will be undertaken on the servicing bays on Ashley Road and Watermead Way, with the majority of deliveries

to be made by HGV's (Heavy Goods Vehicles). In order to ensure compliance and management of servicing and deliveries, this will be monitored and reviewed regularly and will be implemented in line with the Delivery and Servicing Plan produced by WSP. This document accords with the London Plan policy T7 (Deliveries, servicing and construction).

Waste

- 7.106 A Waste Management Plan produced by WSP has been prepared to support the proposed development.
- 7.107 The strategy Waste Management Plan proposes to segregate and divert waste from landfill with sufficient and compliant bin areas being proposed to maximise recycling. Berol House and 2 Berol Yard will have segregated waste storage facilities for general waste and dry combined recyclables and recycling. For 2 Berol Yard, retail waste and residential waste bin stores are located on the northern side of the building.
- 7.108 Berol Quarter will be fully compliant with London Plan policy SI 7 (Reducing waste and supporting the circular economy) as the proposed development provides adequate, flexible, and easily accessible storage space and collection systems that support, as a minimum, the separate collection of dry recyclables and food. This is further in accordance with Local Plan policy SP6 (Waste and recycling).

Health Impact Assessment

- 7.109 A Health Impact Assessment has been prepared by Lichfields to support the proposed development.
- 7.110 The report outlines the proposed development is expected to have an overall neutral effect in relation to health facilities during its demolition and construction phase and an overall positive effect once operational. It is outlined, the development will pose an increased demand to local healthcare facilities, but this will be mitigated through the CIL and/or S106 contributions to support the existing facilities cope with the greater demand.
- 7.111 The proposed development accords with both the London and Local Plan policies GG3 (creating a healthy city) and SP14 (Health and Wellbeing) respectively. These policies seek to improve the health and reduce inequalities. The proposed development will be located in one of the most deprived areas nationally. The assessment outlines the proposed development will have a positive operational health outcome, linked to the provision of new housing in the area, providing residential and commercial floorspace, high quality amenity, public realm improvements, open space and new play areas.

Fire safety

- 7.112 London Plan (2021) policy D12 requires development proposals to achieve the highest standard of fire safety through appropriate construction and design and requires that all major development proposals are submitted with a fire statement.
- 7.113 The Applicant has required that the design of 2 Berol Yard is based on a two means of escape and this principle has been welcomed by the HSE during the pre-application discussions.

- 7.114 The proposed development is accompanied by a Fire Statement, prepared by AESG. The Fire Statement sets out the active fire safety measures and passive fire safety measures that have been incorporated within the design of both Berol House and 2 Berol Yard. It summarises the key fire strategy principles for the building in relation to National Requirements and the London Plan requirements and it concludes that the proposed development has been designed in accordance with these.
- 7.115 Therefore, through appropriate design and construction measures the proposed development is in accordance with London Plan (2021) Policies D5 and D12 and is acceptable from a fire safety perspective.

Ecology

- 7.116 An ecology chapter formed part of the Environmental Statement (ES) (2017) prepared by Lichfields that accompanied planning permission HGY/2017/2044. The chapter explains that the Site itself comprised hard standing and buildings and presented negligible intrinsic value, although presented a suitable habitat for nesting birds in places. It confirms there was very low potential to support roosting bats and that precautionary working methods in accordance with legislation were recommended. The chapter also references Japanese Knotweed and the need to control this through the development of the Site.
- 7.117 On the basis there was little suitable habitats, the chapter did not require any specific mitigation, although it recommended that Demolition and Construction Method statements should include seasonal restrictions to avoid any disturbance to nesting birds.
- 7.118 The Site now only includes hardstanding and there are no habitats on Site. This application therefore relies on the previous ES and will ensure that appropriate precautionary mitigation is addressed in the Demolition and Construction Method Statements to ensure that there is not potential to cause harm to any nesting birds.

Ground contamination

- 7.119 Condition 29 of planning permission HGY/2017/2044 required a Ground conditions and Contamination assessment to be submitted and approved. This was prepared and discharged under application reference HGY/2018/2167 in 2018 using the Geo-Environmental Assessment (2018), prepared by Delta-Simons.
- 7.120 The report can be found Appendix 6 and concludes that no significant or widespread contamination has been identified. There is no potential risk to controlled waters and ground gas. Though there are some pockets of localised low level lead and PAH's and asbestos identified within the Made Ground, these can be easily mitigated with provision of hardcover over the majority of the development. The report concludes no further Site investigation, detailed risk assessment or specific remediation is required. On the basis the condition has been discharged it is considered that no further work is required for this application.

Archaeology

- 7.121 Condition 25 of planning permission HGY/2017/2044 required a desktop archaeology survey to be undertaken. This was prepared and discharged under application reference HGY/2018/2166 in 2018 using the Berol Yard, 25 Ashley Road, Tottenham Hale, London

Borough of Haringey: Historic Building Record (March 2020), prepared by AOC Archaeology Group.

- 7.122 The report contains the key features of historic interest within Berol House. On the basis the condition has been discharged it is considered that no further work is required for this application.

Energy and sustainability

- 7.123 An Energy Statement, Whole Life Carbon Assessment, Circular Economy Statement and Sustainability Statement have been produced by WSP and are submitted as part of the application.
- 7.124 The Energy Statement demonstrates the proposed development comfortably meets Building Regulations Part L 'Target Emission Rate' (TER) requirements as set out in the London Plan policy SI 2 (Minimising greenhouse gas emissions). The proposed development meets and substantially exceeds this target providing a 67% reduction in carbon emissions above Part L. The Whole Life Carbon Assessment, carried out in accordance with the GLA's Whole Life Carbon Assessment Methodology updated in March 2022, assesses the construction of 2 Berol Yard and the refurbishment and redevelopment of Berol Quarter.
- 7.125 The accompanying Whole Life Carbon Assessment outlines the proposed development will provide lower upfront carbon than the set policy benchmark. This has been achieved through the efficient use of materials and designing out waste throughout the design and construction process, which has resulted in significant reductions in the levels of embodied carbon.
- 7.126 The accompanying Sustainability report prepared by WSP shows that a priority of the proposed development is to minimise energy demand, and to incorporate renewable technologies. The scheme will minimise resource and energy consumption and maximise CO2 abatement. The efficient use of materials in addition to designing out waste throughout the design and construction process has led to significant reductions in embodied emissions.
- 7.127 2 Berol Yard makes optimal and efficient use of a highly accessible brownfield urban site in an Opportunity Area and Housing Zone. The proposed development is inherently sustainable, embodying the principles of sustainability which are central to the NPPF.
- 7.128 In accordance with London Plan policy SI 2 (Minimising greenhouse gas emissions) the proposal exceeds the 10% residential and 15% non-residential Be Lean targets through the design and construction of the proposal.
- 7.129 The Applicant is further committed to ensuring the development is connected to the DEN when it becomes operational. LBH is in the process of developing proposals for a District Energy Network (DEN) covering this area of Tottenham Hale. The DEN will be based in an energy centre located close to the Site further north on Ashley Road.
- 7.130 As exemplified in the Energy Assessment, Whole Life Carbon and Sustainability Assessments the proposed development promotes and is designed with measures to reduce energy use and carbon emissions which is in accordance with Local Plan policy SP4

(Working towards a low carbon Haringey), DM21 (Sustainable design, layout and construction), policy SP4 (Working towards a low carbon Haringey) and London Plan policy SI 2 (Minimising Greenhouse Gas emissions).

Noise

- 7.131 A Noise Impact Assessment has been prepared by WSP to support the proposed development and is submitted as part of this planning application. This follows a baseline noise survey being undertaken to establish the existing noise levels to determine the proposed plant noise emission limits and in the assessment of ambient noise levels affecting the proposed development.
- 7.132 The Noise Impact Assessment concludes the Site is considered suitable for residential development and that the proposed glazing specifications and the ventilation strategy for the proposed development achieve the required sound insulation performance to meet the target internal noise criteria for the residential dwellings. The proposed development therefore mitigates and reduces the potential adverse impact resulting from noise from new development to a minimum.
- 7.133 The proposed scheme avoids noise giving rise to significant adverse impacts on health and the quality of life for residents and therefore complies with London Plan policy D14 (Noise) and policy DM23 (Environmental protection) in the adopted Haringey DPD.

Air quality

- 7.134 An Air Quality Assessment prepared by WSP to support the proposed development and is submitted as part of this application. The Air Quality Assessment assesses the potential impacts of local air quality arising from construction activities and the concentrations of nitrogen dioxide (NO₂) that would occur during the opening year of development.
- 7.135 The Air Quality Assessment concludes that through the proposed good site practice and the implementation of suitable mitigation measures, the effect of dust and particulate matter released during the development stages would be significantly reduced. It states that the residual effects of the construction phase on air quality are considered to be negligible.
- 7.136 The Air Quality Assessment concludes that the NO₂ impacts in relation to the proposed temporary gas boilers would not be significant and meet the air quality objective of the London Council's Guidance. No mitigation is required, and the proposed development would be air quality neutral.
- 7.137 Based on the assessment results, it is considered that the development proposals comply with Policy SI 1 (Improving air quality) of the London Plan, Policy DM23 (Environmental protection) in the LBH Local Plan.

Wind and microclimate

- 7.138 A Wind Microclimate report prepared by WSP has been prepared to support the development of the proposed development and is submitted to support this planning application.

- 7.139 There are a series of existing and emerging tall building developments within proximity to the Site, therefore the microclimate impacts have been carefully considered and managed through the design development of the scheme.
- 7.140 The WSP assessment confirms the proposed development will not exceed the recommended criteria for pedestrian safety, the maximum wind levels will not go above 15m/s, which sits comfortably within the recommended levels. This is also the case at elevated levels, wind speeds will not exceed the recommended thresholds at podium level, lower-level terraces, and the Berol House terraces throughout the year.
- 7.141 The results indicate the criteria for safety are exceeded on the top level. However, mitigation measures through the introduction of solid and porous balustrades have been designed into the scheme to manage these impacts. Balustrades have also been installed at the balcony levels to aid conditions.
- 7.142 On the whole the Wind Microclimate report indicates that the resulting pedestrian wind environment at the street level would be suitable for sitting, standing and leisure walking throughout the year and therefore remained comfortable on the intended use.
- 7.143 The proposed development will therefore provide comfortable levels for use within the proposed development and in the surrounding areas and therefore meet the policy requirements of the London Plan policies D8 (Public realm) and D9 (Tall Buildings) and the Local Plan policies DM1 (Delivering High Quality Design) and DM6 (Building heights).

Flood and drainage

- 7.144 The Site is located within Flood Zone 2. Consequently, a Flood Risk Assessment and Drainage Strategy, prepared by WSP has been submitted to support this planning application.
- 7.145 The proposed uses at Berol House are deemed as less vulnerable based on the NPPF (Annex 3). This existing building has a slightly raised ground finished floor level relative to Ashley Road, reducing the impacts in the event of a flood event. Similarly, at 2 Berol Yard, less vulnerable uses will be located at the ground floor, the proposed ground floor will include a raised finish floor level, minimising risk of impact.
- 7.146 The Flood Risk Assessment and Drainage Strategy confirms that the flood risk to the proposed development from coastal and tidal, fluvial, groundwater, sewers & drainage and artificial sources is negligible or low and no mitigation measures are required.
- 7.147 The proposed surface water drainage strategy has been prepared to minimise the risk of flooding and includes the use of Sustainable Drainage Systems (SuDS) features in the form of blue and green roofs and tree pits combined with underground geo-cellular attenuation tanks.
- 7.148 The surface water is attenuated to three times the greenfield runoff rate, as agreed in the 2017 WSP FRA for the extant planning application (ref.HGY/2017/2044) before being discharged to an existing Thames Water surface water sewer beneath Ashley Road.
- 7.149 Regarding the Foul Water Drainage Strategy, it is proposed that 2 Berol Yard will connect to the existing Thames Water Foul Water sewer crossing the Site on the eastern area. For Berol House, it is proposed to reuse the existing foul water drainage connections.

- 7.150 Based on the assessment, the proposed development accords with London Plan policies SI12 (Flood Risk Management) SI13 (Sustainable drainage) and Local Plan policies SP5 (Water management and flooding) and DM 24 (Managing and reducing flood risk).

8.0 **Draft Section 106 Heads of Terms & CIL**

- 8.1 The Applicant is committed to delivering the proposed development in accordance with obligations considered necessary to make the development acceptable in planning terms. Planning obligations should meet the legislative tests set out in Regulation 122 of The Community Infrastructure Levy Regulations 2010 (as amended).
- 8.2 Any such planning obligations will be discussed and agreed between the Applicant and LBH during the determination period, with an agreed set of draft Heads of Terms to form part of a prospective recommendation to the Planning Committee.
- 8.3 The following list provides suggested draft Section 106 Heads of Terms, which will be subject to further discussion with LBH:
1. Affordable housing commitment.
 2. Provision of community space - 15-year lease to be granted to LBH for use by Made in Tottenham.
 3. Public art and community contribution.
 4. Transport measures - including travel plan, car club membership, car parking management plan and provision of induction packs containing public transport, cycling and walking information to all new residents of 2 Berol Yard.
 5. Public realm/delivery management/temporary works - Public access to footpaths, cycleways and open spaces and Community Space, including future bridgehead provided via a Permissive Path right for public, visitors and the alike.
 6. Skills and training - Work with the Haringey Employment and Recruitment Partnership - employment and training opportunities.
 7. Energy - Provisions to connect to the Tottenham Hale District Energy Network (DEN) including delivery of pipework to highway edge to both Buildings. Any shortfall in carbon offsetting required to ensure policy compliance (as set out in London Plan Policy SI 2 (Minimising greenhouse gas emissions)) will be offset at [£90] per tonne, capped on the basis the applicant utilised Air Source Heat Pumps in lieu of gas boilers.
 8. Construction - Obligation to register with the Considerate Constructor Scheme during the construction and demolition phases of the development and pay a maximum sum of £20,000 towards the Construction Coordinator, payable as £10,000.00 on commencement of each building.
 9. Environmental monitoring fee - pay a maximum sum of £ 20,000 towards environmental monitoring of the construction of the development, payable as £10,000.00 on commencement of each building.

Community Infrastructure Levy

- 8.4 Both the Mayor of London and LBS have adopted CIL charging schedules.
- 8.5 For LBH, the Mayor's Levy is £60 per sqm (plus indexation).
- 8.6 The Site falls within LBH's eastern CIL Charging Zone. There is a £100.00 per sqm charge for build to rent in this location. There is zero charge for all other relevant uses.

- 8.7 The development is estimated to be liable for MCIL and LBH CIL contribution of c. £3.9 million (excluding indexation). The precise CIL liability will be confirmed through the formal CIL process in due course.

9.0 **Planning benefits case**

9.1 The proposed development will deliver wide ranging public benefits for the local area and Tottenham more widely, making a significant contribution to delivering the vision and objectives of the development plan, as summarised below:

1. New active commercial quarter and centre for Tottenham Hale. The proposed development will create new space for independents, makers and craft studios and will create a new sense of place. There will be a mix of retail, restaurants and café spaces.
2. New community space occupied by Made By Tottenham to showcase the best of local businesses and to bring local business and the public together.
3. New public realm and a new public square. The proposed development will include the provision of a new public square which can be used for meeting and dwell time as well as for temporary events and pop ups. The new public realm will connect the Site to the public realm started by BSD to the north of the Site as well as the wider area including the Green Link.
4. New connections and permeability. The proposed development will result in new openings within Berol House, providing improved permeability and connection to Ashley Road. The proposed development will include a new bridge head to assist the delivery of the Watermead Way Bridge to enable the Green Link connection.
5. The creation of 210 new high-quality build to rent homes. The new homes will be of exceptional quality and finished to a similar standard to the Gessner.
6. The creation of 202 new affordable habitable rooms equating to 60 new affordable homes.
7. New improved landscape and biodiversity. The proposed development will result in an increase in landscaping including biodiversity enhancing species.
8. Reuse, refurbishment and repurposing of a historic asset. The proposed development will celebrate the history of Berol House.
9. The creation of new iconic architecture across both Berol House and 2 Berol Yard. The proposed designs are of exceptional quality and will enhance this part of Tottenham Hale.
10. The provision of over £3 million in CIL costs towards LBH to assist with the provision of local infrastructure.
11. Contribution of over £1 million in S106 costs towards community improvements and public art.
12. Highly sustainable development which will be BREEAM Very Good and which exceeds the London Plan recommended levels of carbon emission reduction by 32%.
13. The provision of high-quality communal amenity space for residents to enjoy at podium and various roof levels within 2 Berol Yard.
14. Unlocks the delivery of the Site to enable the ARSM masterplan to be fully built out and complete the masterplan.

10.0 Summary and conclusions

- 10.1 This planning statement provides an assessment of the proposed development of the Berol Quarter site against relevant planning policy at national, strategic and local level.
- 10.2 The proposed development, on an allocated site (TH6) and with an extant permission, has been subject to extensive pre-application engagement and has been optimised and enhanced throughout to ensure compliance with planning policy. The final design is of exceptional architectural quality which will mark this as a new destination.
- 10.3 The principle of development for a new mixed-use development comprising a mix of commercial and community space and housing at this location is considered acceptable. The allocation seeks new residential and commercial floorspace which the proposed development will deliver. The proposed development will add to the area's residential mix through the provision of BtR accommodation. It will provide an uplift of 202 affordable habitable rooms which equates to 35% affordable housing and is policy compliant in terms of tenure. This will be a major benefit for Tottenham Hale.
- 10.4 The proposed uses across the development will offer Tottenham Hale a much-improved retail and commercial offer which focusses on the local community. New space will be provided for independents and makers which will work in tandem with the new community space. This will showcase the products made within Berol House and will bring local communities together through business.
- 10.5 The proposed development provides a good mix of homes which responds to policy objectives, which will be of high quality and will include the required level of private and public amenity provision, including play space.
- 10.6 The proposed tall building at 2 Berol Yard will help consolidate the cluster of tall buildings in Tottenham and will complement LBH's DCF 'wave' of taller buildings. It will act as marker when combined with Ferry Island Building 1 and Hale Works to demarcate Tottenham Hale Station as well as the Green Link. An assessment of the proposed development against Policy D9 of the London Plan has been carried out and confirms that the visual impacts of the building from immediate, mid-range and long views are acceptable and will create a benefit in some views, as per the accompanying Townscape and Visual Impact Assessment. The functional impact of the building has been considered in detail and full details of the servicing, maintenance, access, entrance routes, jobs and construction are all provided within this application. The environmental impact of the building, including wind and micro-climate and daylight and sunlight, noise and air quality have all been considered and have been incorporated into the design of the building to ensure this is supportable in terms of policy.
- 10.7 The proposed design and materiality of both Berol House and 2 Berol Yard is considered and reflects the character of the surrounding area and is policy complaint. Berol House will be sensitively refurbished and enhanced and will result in a building of exemplar quality and design. The accompanying heritage impact assessment confirms that there will be no harm to Berol House and its setting. Instead, there will be an enhancement.

- 10.8 The accompanying technical reports have guided the development of the proposed development and demonstrate that there are no technical constraints which would prevent the development from coming forward.
- 10.9 Overall, the proposed development will provide a high-quality development of exemplary design. It will result in multiple benefits and is acceptable in the context of development plan policy and having regard to all other material considerations

Appendix 1 Development in Tottenham Hale

Briefing Note

Our ref 64605/01/BK/Jho

Date 7 September 2022

Subject Tottenham Hale Housing Zone - Berol Yard Affordable Housing

1.0 Overview

- 1.1 This note has been prepared on behalf of our client Berkeley Square Development Limited (BSD) in relation to the emerging development proposals at 'The Berol Quarter' which comprises 2 Berol Yard and Berol House located off Ashley Road, Tottenham Hale (the 'Site').
- 1.2 It has been prepared to demonstrate to LB Haringey how the emerging development will impact the total number of new homes and affordable homes being delivered across the wider Tottenham Hale Housing Zone. It follows the pre-application meeting held on 22 August 22.

2.0 Tottenham Hale Housing Zone Table

- 2.1 The table below sets out the new and emerging developments recognised by LB Haringey in the Tottenham Hale Housing Zone. We have aligned the research we presented at the pre-application meeting with the sites which were included within the planning committee addendum for the Ashley Road depot scheme, planning reference HGY/2022/0752.
- 2.2 The table includes a breakdown of the extant Berol Yard permission ref HGY/2017/2044, the proposed development, and a breakdown of the overall revised scheme to demonstrate how these have been taken into account in the overall calculations.

Site	Applicant	Total no. of new homes	Affordable Units	Percentage AH by unit	Total Hab Room	AH Hab Rooms	Percentage AH by Hab Room
Ashley House and Cannon Factory	Notting Hill Genesis	256	133	52%	709	356	50%
One Station square (aka Millstream Tower)	BSD	128	117	91%	331	297	90%

Site	Applicant	Total no. of new homes	Affordable Units	Percentage AH by unit	Total Hab Room	AH Hab Rooms	Percentage AH by Hab Room
Hale Wharf	Muse Developments Limited and the Canal and River Trust	505	177	35%	1374	481	35%
Ashley Gardens	BSD	417	141	34%	1297	460	35%
Berol Yard	BSD	184	14	8%	456	39	9%
Hale Village SW Plot (Anthology)	Anthology London	279	43	15%	717	108	15%
Monument Way	Newlon	54	54	100%	168	168	100%
Ashley Park	Notting Hill Genesis	97	35	36%	273	118	43%
SDP site	Argent	1036	239	23%	2599	657	25%
Ashley Road Depot	LB Haringey	272	136	50%	959	607	63%
Sub Total		3228	1103	34%	8883	3291	37%
<i>Berol Yard Gessner</i>		<i>166</i>	<i>8</i>	<i>5%</i>	<i>386</i>	<i>17</i>	<i>4%</i>
<i>Berol Yard Berol House</i>		<i>18</i>	<i>6</i>	<i>33%</i>	<i>70</i>	<i>22</i>	<i>31%</i>
Berol Yard (HGY/2017/2044)		184	14	8%	456	39	9%
Proposed Scheme		209	73	35%	575	201	35%
Revised Berol Yard Scheme	BSD	375	81	22%	961	218	23%
New Housing Zone Total		3419	1170	34%	9388	3470	37%
Difference		6%	6%	0	6%	5%	0

3.0 Summary

- 3.1 The table clearly demonstrates that the emerging development proposals will increase the provision of new homes and affordable homes in the Tottenham Hale Housing Zone.
- 3.2 The key headline figures to note are as follows:
1. The previous BY permission (covering The Gessner and Berol House) provided just 14x affordable units (8% by unit; 9% by hab room).
 2. Under the current scheme, Berol Yard as a whole will provide 81x affordable units, including 73x affordable homes within the proposed scheme (and 8x within the Gessner).
 3. This allows for the replacement of 6x approved affordable units in at Berol House – i.e. Berol Yard will deliver a net uplift of 73 affordable homes, of which a net uplift of 67 is provided through the new application.
 4. The application itself will provide 35% affordable housing by hab room.
 5. Across the housing zone the scheme will elevate the overall delivery of homes and affordable homes in Tottenham Hale in absolute terms. The forthcoming application will provide a net uplift of 191 homes, including a net uplift of 67 affordable homes (allowing for the replacement of 18x approved homes and 6x affordable homes at Berol House)|.
 6. With the new proposals in place, the approved schemes across the housing zone comprise 3,419 new homes, of which 1170 are affordable. This equates to 37% affordable housing by hab room (3,470 of 9388 approved hab rooms across the HZ).
 7. This absolute uplift in units equates to a 6% increase in housing delivery and a 6% increase in approved affordable housing across the Tottenham Hale Housing Zone.
- 3.3 BSD have invested significantly in the Ashley Road South Masterplan and have delivered over 37% affordable housing across its portfolio. The proposed development will further strengthen this and will significantly increase the provision of new homes and affordable above the extant planning permission HGY/2017/2044.

Appendix 2 Pre-application consultation summary

Pre-application Consultation

Pre-application feedback

- 2.1 The Applicant has engaged in four pre-application meetings with LBH, two Quality Review Panel (QRP) reviews, one meeting with the GLA, a pre-application meeting with the HSE, a Development Management Forum and a Planning Committee Briefing between 28 June 2022 and 7 November 2022.
- 2.2 The Applicant has responded to key comments throughout the process and the site layout, massing and appearance of the proposed development have evolved at every stage. A timeline and summary of the meetings is set out below:

28 June 2022 - LBH Pre-Application Meeting 1. Key feedback included:

1. Principle of development supported including the delivery of Build to Rent units subject to providing further evidence of the wider Tottenham Hale mix. The Applicant has provided this and further details can be found in Section 2 of this report.
2. LBH supportive of the active rooftops and ground floor uses.
3. LBH queried the proposed development in the context of the emerging 'wave' of tall buildings within the skyline as set out in the DCF. This has been considered in further detail in the accompanying TVIA and the Design and Access Statement.
4. LBH requested further details on the daylight and sunlight effect on nearby homes. This was considered in further detail resulting in the change to the layout of the proposed development.
5. LBH supportive of the concept to open up Berol House at ground floor to improve permeability subject to further understanding of the proposed uses. The Applicant provided further details on this at the second pre-application meeting.
6. LBH confirmed on-street car parking permits will not be allowed, and agreed the general approach for the provision cycle parking provisions.

11 July 2022 - LBH QRP Meeting 1. Key feedback included:

Berol House

1. The panel welcomed the approach taken to repurposing Berol House, including making the ground floor more permeable and the inclusion of flexible unit sizes.
 2. The panel saw Berol House as a great opportunity to provide a focus for the masterplan and encouraged the project team to tease out and reinforce the 'delight' in the architectural expression of the heritage building.
 3. The panel believed that including community uses at ground floor would help integrate the different local communities within the new development.
-

4. The panel emphasised that innovative forms of construction and designing for thermal performance and sustainability, should underpin the approach to the 2 storey extension.

2 Berol Yard

1. The panel emphasised the need for high quality placemaking for Berol Quarter and sought more strategic and detailed approaches to landscape. The panel expressed some concerns about the proposal to locate parking at the 'back of house', adjacent to Watermead Way. Further work was undertaken on this.
2. The panel considered the proposed height and massing to be unsuitable due to its impact upon the adjacent buildings including the Gessner and the public realm. There were concerns that daylight, sunlight, wind modelling and microclimate had not been considered. This was addressed in supporting reports.
3. The panel encouraged the project team to consider future adaptability of the proposed building with the view that 'build to rent' may become less appropriate in 20 years' time.
4. The panel supported the green link although noted there were uncertainties about the detailed design of the footbridge across Watermead Way because of Crossrail.

10 August 2022 - Greater London Authority - Level 2 pre-application meeting. Key feedback included:

1. Proposed development supported in principle.
2. The uplift in residential use compared to the consented scheme was welcomed.
3. A total of 35% (by habitable room) affordable housing, to be delivered at Discount Market Rent (DMR), was welcomed subject to proposed tenure.
4. Further assessments were required to support the proposed height and massing. Adjustments to layouts were required to improve the quality of accommodation in connection to privacy, aspect, acoustic mitigation, and access to daylight. These have been undertaken by Applicant team, see supporting reports.
5. Concerns were raised about the narrowness of the 'green link' route. This has been widened, see drawings and DAS.
6. Concern was raised about inactive frontages and the quality of the public realm to the north and the east of 2 Berol Yard. These have been activated, see drawings and DAS.

22 August 2022 - LBH Pre-Application Meeting 2. Key feedback included:

1. LBH agreed that the reduction in height to 29 storeys, plus the ground floor was a positive change.
 2. LBH delivery of the bridge is a strong and convincing case for the justification of delivering a tall building.
 3. LBH sought clarification of how the public realm sits and integrates within the surrounding context.
-

4. LBH questioned how the 35% affordable threshold will be met. Further details were provided to LBH and accompany this planning application.

26 August 2022 – LBH Design Meeting 1 (Vu. City). Key feedback included:

1. LBH confirmed long range views were largely positive.
2. LBH confirmed two sensitive views were those that impacted on High Cross Monument and Bruce Grove Conservation Area.
3. Confirmation that the design was impressive in terms of its profile.
4. There were general questions about the local views, the width of the proposed streets and heights of units on the ground floors. These have been addressed through various design iterations.

26 September 2022 - Health and Safety Executive: pre-application meeting with the Health and Safety Executive (HSE).

- 2.3 The HSE were consulted in relation to fire for Berol House and 2 Berol Yard. Summary of feedback is as follows:

1. The need for the proposed external solar panel on the side elevations of 2 Berol Yard to satisfy Building Regulation 7(2) pertaining to fire performance. HSE further queried fire service access and facilities to enable firefighters to deal with fires involving the solar panel arrays on the proposed elevation. Applicant decided to remove these.
2. HSE supported proposal for two staircases and questioned the proximity of the two staircases in relation to the fire safety standard BS9991 clause 27; tenable conditions were advised by HSE for both staircases in the event of a fire.

5 October 2022 - LBH Development Management Forum

- 2.4 The Applicant presented the emerging proposed development to the LBH Development Management Forum on 5 October 2022. Attendees included Councillors and members of the public. There were a number of questions in relation to height, unit mix, costs associated with rents for commercial and residential, the pendant on Berol House, cycling provision and cycling access onto the proposed bridge head and mitigation in relation to noise and pollution on Watermead Way.

7 October 2022 - LBH Pre-application Meeting 3. Key feedback included:

1. Proposal is supported in principle.
 2. Some concerns were raised about the height and massing of 2 Berol Yard in certain locations, mainly because of the level of architectural and elevational detail. This was addressed through additional work on window heights and articulation.
 3. Concern was raised over the quantity of north or northeast facing single aspect homes. This was addressed when it was demonstrated there would be no north facing homes.
 4. Enabling works for a bridge are encouraged but the bridge over Watermead Way needs to form part of these proposals given the stated aims of the development to mark the Green Link.
-

18 October - LBH Design Officer Meeting 2

- 2.5 Applicant team met with LBH design officer and planning officer to run through external and internal daylight sunlight impacts of the proposed development. The Applicant team also ran through the draft TVIA conclusions and the supporting AVRs of the scheme. LBH was generally supportive subject to detailed comments which have been acted upon by the Applicant team.

19 October 2022 - LBH second QRP and meeting with officers from the LBH

Key feedback on Berol House included:

1. The extension was considered to need a lightweight treatment in terms of materiality and ensuring that the base remains the strong and more solid element of the building.
2. The heart of the scheme was viewed as Berol Square, and Berol House should have a positive relationship with the square.

Key feedback on 2 Berol Yard included:

1. The heights, rotation, and composition of each element of 2 Berol Yard was discussed in depth over the QRP sessions; these elements were considered to need refinement and adjustment. Overall, it was felt that 30 storeys done in the right way can be very successful in this location and marks the station well.
2. The core was considered to need more openings to be activated and better articulated. This has been incorporated into proposed development, see drawings and DAS.
3. The internal layout of 2 Berol Yard was discussed in relation to improving the legibility of the residential main entrance, access to the podium gardens and designing the podiums to be successful public spaces. This has been incorporated into proposed development, see drawings and DAS.
4. The Green Link required improvements to be more civic and incorporate more planting.
5. The bridge was viewed as a great opportunity that required design refinement to carefully consider pedestrian and cyclist use during the day and night.
6. Public spaces need to be exceptional for tall buildings, relating well to surrounding buildings and being designed for activity. This has been incorporated into proposed development, see drawings and DAS.

7 November 2022 - LBH Members Briefing

- 2.6 The Applicant presented the emerging proposed development to the LBH planning committee members. Key questions related to the restoration of the windows at Berol House, the management of built to rent, the loss of the college, and the colours of the proposed materiality across the development. There was a comment of the need to maximise the amount of accessible housing, wellness and the creation of green spaces and the amount of single aspect homes verses dual aspect homes.
-

Appendix 3 List of Policies

The London Plan (2021)

- 1 Policy D2 (Infrastructure requirements for sustainable densities)
 - 2 Policy D3 (Optimising site capacity through the design-led approach)
 - 3 Policy D4 (Delivering good design)
 - 4 Policy D6 (Housing quality and standards)
 - 5 Policy D7 (Accessible Housing)
 - 6 Policy D9 (Tall Buildings)
 - 7 Policy D12 (Fire safety)
 - 8 Policy D14 (Noise)
 - 9 Policy E1 (Offices)
 - 10 Policy E3 (Affordable Workspace)
 - 11 Policy G4 (Open space)
 - 12 Policy G5 (Urban greening)
 - 13 Policy GG2 (Making the best use of land)
 - 14 Policy GG4 (Delivering the homes Londoners need)
 - 15 Policy H1 (Increasing housing supply)
 - 16 Policy H4 (Delivering affordable housing)
 - 17 Policy H5 (Threshold approach to applications)
 - 18 Policy H6 (Affordable housing tenure)
 - 19 Policy H10 (Housing size mix)
 - 20 Policy H11 (Build to rent)
 - 21 Policy HC1 (Heritage conservation and growth)
 - 22 Policy HC3 (Strategic and local views)
 - 23 Policy HC4 (London view management framework)
 - 24 Policy S3 (Education and Childcare Facilities)
 - 25 Policy S4 (Play and informal recreation)
 - 26 Policy SD1 (Opportunity areas)
 - 27 Policy SI 2 (Minimising Greenhouse Gas emissions)
 - 28 Policy SI 3 (Energy Infrastructure)
 - 29 Policy SI7 (Reducing waste and supporting the circular economy)
 - 30 Policy T5 (Cycling)
 - 31 Policy T6 (Car Parking)
-

- 32 Policy T6.1 (Residential parking)
- 33 Policy T6.2 (Office Parking)
- 34 Policy T7 (Deliveries servicing and construction)

Haringey's Local Plan: Strategic Policies DPD (2013 with alterations 2017):

- 1 Policy SP1 (Managing Growth)
- 2 Policy SP2 (Housing)
- 3 Policy SP4 (working towards a low carbon Haringey)
- 4 Policy SP5 (Water Management and flooding)
- 5 Policy SP7 (Transport)
- 6 Policy SP8 (Employment)
- 7 Policy SP11 (Design)
- 8 Policy SP12 (Conservation)
- 9 Policy SP13 (Open space and biodiversity)

Haringey's Local Plan: Development Management DPD (2017)

- 1 Policy DM1(Delivering high quality design)
- 2 Policy DM9 (Management of the historic environment)
- 3 Policy DM11 (Housing mix)
- 4 Policy DM12 (Housing design and quality)
- 5 Policy DM13(Affordable Housing)
- 6 Policy DM21 (Sustainable design, layout, and construction)
- 7 Policy DM22(Decentralised energy)
- 8 Policy DM24 (Managing and reducing flood risk)
- 9 Policy DM37 (Maximising the use of employment land and floorspace)
- 10 Policy DM41 (New town centre development)
- 11 Policy DM45 (Optimising the use of the town centre land and floorspace)
- 12 Policy DM48 (Use of Planning Obligations)
- 13 Policy DM49 (Managing the provision and quality of community infrastructure)
- 14 Policy DM55 (Regeneration and masterplanning)

Tottenham Area Action Plan (2017) TAAP

- 1 Policy AAP6 (Urban Design and Character Including Tall Buildings)
 - 2 Policy AAP1 (Regeneration and master planning)
-

Appendix 4 London Plan Policy D9 Assessment

London Plan Policy D9 clause	Proposed development's response
Locations (part B3): <i>Tall buildings should only be developed in locations that are identified as suitable in Development Plans.</i>	• Tall building area (BH2) – LBH Policies Map and LBH Development Management Plan – therefore tall buildings are already considered suitable under local and strategic planning policy • The Ashley Road South Masterplan falls within the Tall Building Area BH2 (LBH Development Management Plan) and Growth Area GA1 (Tottenham Hale AAP) • As such the site falls within a defined area considered suitable for tall buildings under local and strategic planning policy. There is therefore policy support for the principle of a tall building at this site. • Policy and contextual support for the principle of a tall building at the site in this clearly suitable tall building location.
Impacts (part C): <i>Development proposals should address the following impacts:</i>	
1) Visual impacts:	
a) <i>the views of buildings from different distances</i>	• Views have been assessed as part of the accompanying townscape assessment, prepared by Lichfields. Long Range Views • The tower proposal lies within, and contributes to, an established neighbourhood cluster of tall buildings. • It rebalances the cluster, better reflecting the structure of the regeneration area on the skyline • It strengthens the composition of the cluster by emphasising the established wave form and maintains the hierarchy of the Ferry Island Building 1 as the tallest. • The clustered and stepped form produces an elegant and identifiable silhouette that reduces in profile as it rises to a slender top Mid-Range Views • The building is a marker, emphasising the important Green Link and the Ashley Road crossing, vital parts of the active travel network, the new retail and workspace quarter and the new Berol Square.

London Plan Policy D9 clause	Proposed development's response
	Immediate Views • The plan form of the proposal defines a new public space and the Green Link. • The Plan is shaped to provide good light and appropriate privacy to surrounding residential buildings. • The steeped clustered form responds directly to the buildings in the immediate context. • The form protects privacy stepping back on upper floors.
<i>b) whether part of a group or stand-alone, tall buildings should reinforce the spatial hierarchy of the local and wider context and aid legibility and wayfinding</i>	• The proposal marks the green link, a vital part of the active travel network. • It provides a lift, stair and landing point for the future Watermead Way section of the green link bridge. • The proposal improves physical and visual permeability.
<i>c) architectural quality and materials should be of an exemplary standard to ensure that the appearance and architectural integrity of the building is maintained through its lifespan</i>	• Committed to delivering high quality design and the architecture to ensure that the buildings are to an exemplary standard. • Design balances modern architectural approaches with cues from the local heritage and character, repurposes Berol House in a sympathetic manner. • Brick based materials will last well throughout the development's lifespan.
<i>d) proposals should take account of, and avoid harm to, the significance of London's heritage assets and their settings. Proposals resulting in harm will require clear and convincing justification, demonstrating that alternatives have been explored and that there are clear public benefits that outweigh that harm. The buildings should positively contribute to the character of the area</i>	• Heritage Statement will assess significance of relevant heritage assets and their settings thoroughly. • There are several listed buildings and conservation areas within a 1km radius of the site, but site does not form an important aspect of the setting of these listed buildings. The closest designated heritage asset is 600m away. • Our proposal is being designed in sympathy with and alongside proposals for Berol House. The overall proposal will bring significant public benefit and there will be no harm to heritage assets. The form, materials, rhythms and details of our proposal have been carefully considered closely relate to the historic and emerging character of the immediate and wider context.
<i>e) buildings in the setting of a World Heritage Site must preserve, and not harm, the Outstanding Universal Value of the World</i>	• Not applicable

London Plan Policy D9 clause	Proposed development's response
<i>Heritage Site, and the ability to appreciate it</i>	
f) <i>buildings near the River Thames, particularly in the Thames Policy Area, should protect and enhance the open quality of the river and the riverside public realm, including views, and not contribute to a canyon effect along the river</i>	• Not applicable
g) <i>buildings should not cause adverse reflected glare</i>	• Solar glare analysis to be undertaken as part of the design development and application submission. • Our robust brick facade with deep set windows and external solar shading is unlikely to produce any solar glare issues. This is demonstrated within the Daylight and Sunlight Assessments.
h) <i>buildings should be designed to minimise light pollution from internal and external lighting</i>	• Ambient and appropriate illumination will be provided for wayfinding and safety. • Intention to build on successful lighting and landscaping at 1BY (The Gessner).
2) Functional impacts:	
a) <i>the internal and external design, including construction detailing, the building's materials and its emergency exit routes must ensure the safety of all occupants</i>	• As part of a comprehensive suite of fire safety measures, the proposal includes two stairs, fire and evacuation lifts. The building will be sprinklered and no combustible materials will be used to its external wall construction. Emergency exit routes will provide legible and safe means of escape for all occupants.
b) <i>buildings should be serviced, maintained and managed in a manner that will preserve their safety and quality, and not cause disturbance or inconvenience to surrounding public realm. Servicing, maintenance and building management arrangements should be considered at the start of the design process</i>	• Onsite concierge to ensure a management presence. • Servicing and maintenance will be crucial to the operation of the scheme.
c) <i>entrances, access routes, and ground floor uses should be designed and placed to allow for peak time use and to ensure there is no unacceptable overcrowding or isolation in the surrounding areas</i>	• The quantum and nature of access routes are appropriate the scale of the development and as such, there will be no overcrowding. • The removal of cars through the centre of the scheme creates better access and movement around the ground floor on floor.

London Plan Policy D9 clause	Proposed development's response
d) <i>it must be demonstrated that the capacity of the area and its transport network is capable of accommodating the quantum of development in terms of access to facilities, services, walking and cycling networks, and public transport for people living or working in the building</i>	The site is highly accessible. The proposal is a 3-minute walk to a significant public transport interchange and active travel networks. A full travel plan and assessment accompanies this submission.
e) <i>jobs, services, facilities and economic activity that will be provided by the development and the regeneration potential this might provide should inform the design so it maximises the benefits these could bring to the area, and maximises the role of the development as a catalyst for further change in the area</i>	- Economic activity and provision of jobs and facilities on the site will be concentrated in the commercial units and around the public square at the centre of the development. - Layout design specifically encourages activity through the site to maximise footfall and increases active frontage which in turn bolsters the vibrancy of the area. - Square at the south of the development brings people up through the existing district centre towards to new developments and is a new destination in Tottenham Hale. - Investment in the reuse of Berol House.
f) <i>buildings, including their construction, should not interfere with aviation, navigation or telecommunication, and should avoid a significant detrimental effect on solar energy generation on adjoining buildings</i>	Not applicable.
3) Environmental impact:	
a) <i>wind, daylight, sunlight penetration and temperature conditions around the building(s) and neighbourhood must be carefully considered and not compromise comfort and the enjoyment of open spaces, including water spaces, around the building</i>	- Careful consideration been given to microclimate and amenity impacts as a result of the development during the iterative design progress. Advice from specialists and pre-app stage technical assessments has been used to refine the scheme's design - Proposed development and the neighbouring buildings and local area will not be compromised due to the development in terms of amenity impacts. Residents and visitors use and enjoyment of the public spaces has been at the forefront of the landscape design. - Detailed wind, noise and air quality assessments further iterate this statement.
b) <i>air movement affected by the building(s) should support the effective dispersion of</i>	See above.

London Plan Policy D9 clause	Proposed development's response
<i>pollutants, but not adversely affect street-level conditions</i>	
<i>c) noise created by air movements around the building(s), servicing machinery, or building uses, should not detract from the comfort and enjoyment of open spaces around the building</i>	• See above.
4) Cumulative impacts:	
<i>a) the cumulative visual, functional and environmental impacts of proposed, consented and planned tall buildings in an area must be considered when assessing tall building proposals and when developing plans for an area.</i>	• An in depth review of townscape/visual receptors and testing of representative views in VU City and against existing/proposed buildings has been tested. • Please see the Design and Access Statement for further detail.

**Appendix 5 Ecology report submitted for
application ref.
HGY/2017/2044**

Ashley Gardens and Berol Yard Environmental Statement

Chapter N: Ecology and Nature Conservation

June 2017

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N1.0 Introduction

- N1.1 This Chapter reports the assessment of effects of the Proposed Development on ecological receptors identified to have potential to be significantly affected during the demolition, construction, and/or operational phase of the Proposed Development. The Proposed Development entails both redevelopment of the Ashley Gardens (AG) Site for which detailed planning consent is sought, and the Berol Yard (BY) Site for which a hybrid planning application has been submitted. For the purpose of this assessment three scenarios are referenced:
- 1) The AG development and the BY development;
 - 2) The AG development without the BY development; and
 - 3) The BY development without the AG development.
- N1.2 In all cases, likely effects of the Proposed Development as a whole are considered (the first scenario) followed by any differences applicable to the other scenarios (the second and third scenario). In particular, this chapter considers the potential effects of the Proposed Development upon:
- The Lee Valley Special Protection Area (SPA) and Ramsar, and nearest constituent Site of Special Scientific Interest (SSSI) the Walthamstow Reservoirs;
 - The Down Lane Recreation Ground Site of Local Importance for Nature Conservation (SLINC) located immediately north of the Site; and
 - Nesting birds which may utilise habitat currently present on Site, including both common and widespread species and black redstart *Phoenicurus ochruros*.
- N1.3 Baseline conditions are described in Section N4.0; whilst no habitat of particular conservation value is currently present on Site, change in habitat value resulting from the Proposed Development is also considered in this chapter for completeness.
- N1.4 Where appropriate, this chapter and appended reports cross reference other Chapters which provide detailed assessment in relation to potential changes in air quality (Chapter J) and noise and vibration (Chapter K) in addition to the Design and Access Statement (DAS) and Landscape Strategy.
- N1.5 This Chapter (and its associated figures and appendices) should be read with introductory Chapters (Chapters A to C) and Chapter O ‘Cumulative Effects’. Table N1.1 below lists appendices to this Chapter.

Table N1.1 Appendices to Chapter N

Appendix No.	Document
N1	WSP PB (2016). Ashley Road South – BSD: Extended Phase 1 Habitat Survey and External Building Inspection for Bats.

N2.0

Policy and Legislative Context

Legislative Framework

N2.1

The applicable legislative framework is summarised as follows:

- Council Directive 79/409/EEC on the Conservation of Wildlife Birds 1979 (the EC ‘Birds Directive’) (Ref. N.i);
- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora 1992 (the ‘Habitats Directive’) (Ref. N.ii);
- The Conservation of Habitats and Species Regulations 2010 (Ref N.iii);
- The Wildlife and Countryside Act 1981 (Ref. N.iv); and
- The Natural Environment and Rural Communities Act 2006 (Ref. N.v).

Planning Policy

N2.2

Planning policy at the national and local level and its relevance to environmental design and assessment is discussed in Chapter B. Key policies relevant to ecology and nature conservation and the Proposed Development are described below.

National Planning Policy Framework

N2.3

The National Planning Policy Framework (NPPF) (**Ref. N.vi**) sets out, amongst other points, in Paragraph 109 how at an overview level the ‘planning system should contribute to and enhance the national and local environment by:

- *...recognising the wider benefits of ecosystem services;*
- *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government’s commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures...*

N2.4

The NPPF states that this should be achieved through local planning development frameworks and in Paragraph 113 gives recommendations for criteria based policies which recognise the hierarchy of designated sites which range from internationally important habitat, to sites of importance at a local level and ensure that protection is ‘commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks.’

N2.5

A list of principles which local planning authorities should follow when determining planning applications is included in Paragraph 118 which states the following:

- *‘if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as last resort, compensated for, then planning permission should be refused;*
- *proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site’s notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific*

interest and any broader impacts on the national network of Sites of Special Scientific Interest;

- *...opportunities to incorporate biodiversity in and around developments should be encouraged;*
- *planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss...*

N2.6 Although the NPPF revoked Planning Policy Statement 9 (PPS9, Ref. N.vii), the ODPM circular 06/2005 (Ref. N.viii) originally prepared to accompany PPS9 remains current; this states that 'the presence of a protected species is a material consideration when a planning authority is considering a development proposal'. The circular advises that local authorities should consult Natural England before granting planning permission if the proposals could adversely affect a protected species.

Local Planning Policy

The London Plan (July 2011, consolidated with alterations March 2015 and March 2016) ('The London Plan') (Ref. N.^{ix})

N2.7 The London Plan was published in July 2011 (and consolidated with alterations March 2015 and March 2016) and sets out a fully integrated economic, environmental, transport and social framework for the development of London to 2031. Chapter 7 of the London Plan is entitled 'London's Living Spaces and Places' and it is this chapter that contains the majority of policies of relevance to the natural environment.

N2.8 Policy 7.19 Biodiversity and Access to Nature. This is the primary policy relating to the natural environment and states that the Mayor will work with all relevant partners to ensure a proactive approach to the protection, enhancement, creation, promotion and management of biodiversity in support of the Mayor's Biodiversity Strategy (see below). The policy requires that there is planning for nature from the beginning of the development process and that steps are taken to secure positive gains for nature. The policy also states that proposals promoted by the London Plan will not adversely affect the integrity of European sites of nature conservation either alone or in combination with other plans or projects.

N2.9 In relation to development proposals, Policy 7.19 states that these should make a positive contribution to biodiversity, prioritising assisting achievement of BAP targets and ensuring there is no adverse impact on designated sites of nature conservation or the population or conservation status of a protected species, or a priority species or habitat identified in a UK, London or appropriate regional BAP or borough BAP.

N2.10 Policy 7.19 gives specific consideration to Sites of Importance for Nature Conservation (SINCs), stating that the highest protection should be afforded to sites with existing or proposed international and national designations. Development proposals should give strong protection to Sites of Metropolitan Importance for Nature Conservation (SMINCs), which are sites that have strategic nature conservation importance. Sites of Borough and Local Importance for Nature Conservation should be given protection commensurate with their importance. This policy states that '*When considering proposals that would affect directly, indirectly or cumulatively a site of recognised nature conservation interest, the policy states that the following hierarchy will apply:*

- *Avoid adverse impact to the biodiversity interest;*

- *Minimise impact and seek mitigation; and*
- *Only in exceptional cases where the benefits of the proposal clearly outweigh the biodiversity impacts, seek appropriate compensation.'*

N2.11 In addition to the policies within Chapter 7, there are a number of policies which are of relevance to the natural environment, reflecting the cross-cutting nature of this topic area. Specifically, there are policies within Chapter 3: 'London's People' which relate to health and social infrastructure which identify the importance of access to green and open spaces (Policies 3.2 and 3.6). Within Chapter 5: 'Climate Change', there are policies which promote and protect biodiversity and green infrastructure in recognition of the important role these play in urban cooling and climate change adaptation. Of particular relevance are Policy 5.3: Sustainable Design and Construction, Policy 5.10: Urban Greening and Policy 5.11: Green Roofs and Development Site Environs. There are also policies within this chapter which relate to flood risk and sustainable urban drainage which have a degree of overlap with ecology and nature conservation matters.

Haringey's Development Plan

N2.12 Haringey's development plan is currently made up of the London Plan (see above), Haringey's Strategic Policies Local Plan (adopted March 2013) (Ref. N.x), and the saved Unitary Development Plan (UDP) policies (adopted 2006) (Ref. N.xi).

N2.13 The Strategic Policies Local Plan includes Policy SP13 that specifically sets out Haringey's expectations with respect to development, open space and biodiversity. The policy states that:

N2.14 *'All development shall protect and improve sites of biodiversity and nature conservation, including private gardens through its:*

- *Contribution to wildlife and ecological habitats and, where possible, include green and brown roofs, rainwater harvesting, green walls, bird and bat nesting/roosting opportunities;*
- *Protection, management and maintenance of existing trees and the planting of new trees where appropriate; and*
- *Protection, enhancement and creation of Sites of Importance for Nature Conservation (SINCs) and Local Nature Reserves (LNRs).*

N2.15 *The Council will enhance and improve the borough's green infrastructure through:*

- *Implementation of the borough's green infrastructure projects (such as Lordship Recreation Ground Improvements);*
- *Working with adjoining boroughs and partners to safeguard the existing Green Infrastructure, to create new green infrastructure and link up sites; and*
- *Working with Lee Valley Regional Park Authority to protect and enhance access to the park, its waterside open spaces and habitats, recreational and sporting facilities.*

N2.16 Saved UDP policies include ENV5, ENV6 and ENV7 which relate to avoiding detrimental effects upon water courses, avoiding noise pollution, and avoiding air, water and light pollution respectively.

Haringey Sustainable Design and Construction Supplementary Planning Document (adopted March 2013)

N2.17 Haringey Sustainable Design and Construction Supplementary Planning Document (Ref. N.xii) sets out measures to be included within development designs to maintain or enhance site

biodiversity, to achieve an overall net gain in biodiversity in the Borough. These measures include provision of brown or green roofs and artificial habitats such as bird and bat boxes and provision of management plans for biodiversity features or landscaping throughout the lifetime of the development. This document also requires a full ecological assessment to be submitted with the planning application on sites where legally protected species are present, including description of measures to avoid and minimise effects and of compensation to be provided. The SPD requires locally designated sites (Sites of Importance for Nature Conservation (SINCs), Local Nature Reserves and Ecological Corridors) to be considered prior to submission of a planning application. Requirements for landform, landscaping, trees and biodiversity are also outlined in SPG1a which sets out Design Guidance (adopted 2006) (Ref. N.xiii).

Guidance

UK Post-2010 Biodiversity Framework (Ref. N.^{xiv})

- N2.18 The UK Post-2010 Biodiversity Framework was published by the Joint Nature Conservation Committee (JNCC) and Department for the Environment, Farming and Rural Affairs (Defra) in July 2012 on behalf of the Country specific Biodiversity Groups in the United Kingdom. The framework sets out broad enabling structures for actions to conserve and enhance biodiversity across the UK, underpinned by country-specific action plans which continue delivering priorities building upon work completed under the UK Biodiversity Action Plan (UKBAP) (although the UKBAP partnership no longer operates).
- N2.19 In England, the action plan which seeks to deliver within this framework is 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' published by Defra on 19th August 2011. The overall mission of the '2020 Strategy' is to 'halt overall biodiversity loss, support healthy well-functioning ecosystems, and establish coherent ecological networks with more and better places for nature for the benefit of wildlife and people'.

The Mayor's Biodiversity Strategy (2002) (Ref. N.^{xv})

- N2.20 The 'Mayor's Biodiversity Strategy' outlines 14 policies for biodiversity, including its protection, management and enhancement, as well as its incorporation into new developments. It is within this strategy that SMINC's are identified and are recommended to be protected in boroughs' Unitary Development Plans.

Haringey Biodiversity Action Plan (BAP) (Ref. N.^{xvi})

- N2.21 The Haringey Biodiversity Action Plan (HBAP) was created in 2009 and aims to improve biodiversity value across the Borough and support the priorities and targets of both the London BAP and UK BAP. 'Protecting the Natural Environment' is one of seven priorities in the London Borough of Haringey's Greenest Borough Strategy which states '*We will protect Haringey's natural environment by working with local people and other partners to ensure that we preserve, improve, and increase, green spaces and their biodiversity through improved maintenance, accessibility and sustainable practices.*' The action plan includes targets to maintain and improve ecologically valuable habitats along with specific species action plans for bats.

N3.0

Assessment Methodology & Significance Criteria

N3.1

This EcIA has been prepared with reference to the Chartered Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment in the United Kingdom ('the EcIA Guidelines'; Ref. N.xvii).

N3.2

Each ecological feature has been evaluated using a geographic scale of reference and potential effects during the construction and operational phases of the Proposed Development, assessed in the absence of mitigation. Mitigation measures have been considered and residual effects assessed.

N3.3

Ecological features have been scoped in to the assessment if effects could be significant at Local scale or above (in accordance with the geographic scale of reference) or if effects have legal implications, and/or if consultation with relevant stakeholders requires their inclusion on other grounds.

Scope of the Assessment

N3.4

The scope of this Chapter is to consider the likely effects of the Proposed Development upon sensitive ecological features within the Sites and in the wider area (where appropriate) identified during baseline survey and data collation. The scope is informed by the EIA scoping opinion provided by the London Borough of Haringey (LBH) (dated 7th September 2016) and subsequent consultation undertaken (see Table N3.2). The Proposed Development includes both redevelopment of the AG Site for which detailed planning consent is sought, and the BY Site for which a hybrid planning application has been submitted.

N3.5

The Proposed Development includes two planning application components; the AG development (outline), the BY Development (hybrid). For the purpose of this assessment three scenarios are referenced:

- 1) The AG development and the BY development;
- 2) The AG development without the BY development; and
- 3) The BY development without the AG development.

N3.6

In all cases, likely effects of the Proposed Development as a whole are considered (the first scenario) followed by any differences applicable to the other scenarios (the second and third scenario).

N3.7

Method of Baseline Data Collation

Desk Study

N3.8

An ecological desk study was completed to collate existing records held by third parties for the Site and surrounding area. In September 2016, WSP|PB requested current ecological data from Greenspace Information for Greater London (GiGL), London Bat Group (LBG) and searched online data sources for records relevant to the Site (search radii, and data sources are listed in Table N3.1 below).

Table N3.1 Relevant Search Radii and Data Sources

Search Radius	Potential Ecological Constraints	Source of Data	Data Received/Extracted
Sites and Habitats			
10km	European designated Natura 2000 sites (Special Areas of Conservation (SAC) and SPA and internationally designated RAMSAR sites.)	Natural England corporate datasets	Sep 16
2km	UK Statutory Designated sites	Natural England corporate datasets	Sep 16
2km	Non-statutory Designated sites	GiGL	Sep 16
	Ancient Woodland	Natural England corporate datasets	Sep 16
	Biodiversity Action Plan (BAP) Habitat	MAGIC	Sep 16
Species			
2km	Protected and Notable Species Records	GiGL	Sep 16
5km	Bat Records	GiGL/LBG	Sep 16

Extended Phase 1 Habitat Survey and Bat Inspection (External and Internal)

- N3.9 An extended Phase 1 habitat survey of the Site was completed on 13th October 2016. The objective of the survey was to confirm the current distribution of habitats on Site and the potential for protected species and/or species of conservation concern to be present.
- N3.10 The Phase 1 habitat survey was completed in line with standard methods (Ref. N.xviii) and extended to include an assessment as to the suitability of habitat on Site for protected species with regard to current good practice for preliminary ecological appraisal (Ref. N.xix). Specifically, a ground level inspection of buildings and trees present was completed in parallel to assess the potential for bat roosts to be present, methods followed good practice guidelines (Ref. N.xx).
- N3.11 A further survey visit was completed on 1st November 2016. During this second visit features identified on the exteriors of buildings B2, B3, B6 and B7 were subject to detailed inspection at-height to fully assess their potential to support roosting bats and search for any evidence of prior use (see Figure 6 of the extended Phase 1 habitat survey in Appendix N1). The inspection was completed by a licensed ecologist using a fibre-optic scope and a powerful torch, with direct access gained from a ladder. In addition, all accessible interiors/roof voids of Building B2 (the only structure with a dedicated loft void) were also inspected using a high-powered torch. The inspection enabled further information regarding the building (and loft) structure to be collected, and a search for live or dead bats and evidence of the presence of bats such as bat droppings, scratch marks, characteristic oil staining around potential roosting features and urine staining.

Ecological Impact Assessment

Scoping of Ecological Features

- N3.12 The results of the baseline data collection were used in conjunction with the responses from consultees, and information on the scheme design, to assess the likely significant ecological effects that the Proposed Development could have during both the construction and operational phases.
- N3.13 The conservation value of each ecological feature was evaluated within a geographical context using the categories recommended in the EcIA Guidelines. The evaluation considered a variety of factors including for example (but not exclusively) the rarity of a species or habitat; habitat diversity, whether the species population size is notable in a wider context, whether the habitats are important in supporting a rare species, whether species are on the edge of their range or whether the faunal assemblage is characteristic of that habitat type.
- N3.14 The following geographic scales are used:
- International;
 - UK;
 - National;
 - Regional;
 - County (or Metropolitan e.g. London);
 - District (or Unitary Authority, City or Borough);
 - Local or Parish; and
 - Site value (zone of influence).
- N3.15 In addition, in order to distinguish between habitats and species that are of value at the Site scale and those that have negligible value at any scale (i.e. lower than Site value), the latter have been assigned to be of negligible value.

Characterising the Potential Effect

- N3.16 Based on an understanding of the baseline conditions and of the Proposed Development, potential effects on features scoped into the assessment have been considered, taking into account construction (to include site preparation and demolition of existing buildings) and operational phases. Effects have been assessed against baseline conditions and have been characterised in terms of whether the effect is positive or negative, the extent (area) which would be affected, the magnitude (size, amount, intensity or volume) of the effect, the duration¹ (short term, medium term, long term and permanent or temporary) of anticipated change and consequently resulting effects, whether the effect is reversible (i.e. whether recovery from the effect is possible within a reasonable timescale) and the timing and frequency of change as a consequence of the Proposed Development.

Assigning Significance

- N3.17 The geographical scale of significance has been used as specified within the EcIA Guidelines both to evaluate the receptor and to assess the scale at which an effect is significant. An

¹ The EcIA guidelines advise the duration of an effect should be defined with regard to the ecological characteristics of the feature affected. Consequently, what is considered short term, medium term or long term can vary depending on the feature affected; therefore the meaning of these terms will be defined within the assessment text where used.

ecologically significant effect is defined as an effect (adverse or beneficial) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area.

- N3.18 The significance of effects upon features is determined considering their value at a geographic scale (as noted above); however any given effect may be significant at a reduced scale depending on the extent and magnitude of the effect. For example although a habitat type may represent 20% of the resource at a County level and hence be considered of value at this scale, the proposed works might affect only a portion of the habitat representing 1% of the resource in the County hence the effect would not be considered significant at this scale. However, that 1% may represent 20% of the resource at a Local scale and therefore the effect at this geographic scale would be considered significant. Where effects are considered significant at the Site scale this is defined as an effect that is significant within the Ashley Road Masterplan area.

Assigning a Threshold Value

- N3.19 In the process of EcIA, it is important to select the appropriate features for inclusion in the assessment. For the purpose of this assessment receptors have been scoped into the assessment where potential effects could be of significance at the Local scale or greater and, or where there are legal and/or planning implications associated with effects.

Consultation

- N3.20 Table N3.2 provides a summary of the key consultation activities undertaken in support of the preparation of this Chapter.

Table N3.2 Summary of Consultation

Body/ organisation	Individual/ stat body/organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
Haringey Borough Council	Stuart Minty	Scoping response dated 07/09/2016	Scoping response including Natural England's response on the Scoping request; which specifies that ' <i>the ES should assess the potential for the proposal to affect designated sites</i> '

Assumptions and Limitations

- N3.21 Baseline data used to inform this assessment has been collected specifically for this purpose (extended Phase 1 habitat survey and external bat inspection), and drawn from third party sources (GIGL and LBG). Together, the information enables the evaluation of ecological features and consideration of potential effects upon these receptors.
- N3.22 Due to the project programme, it has not been possible to complete targeted bird surveys to record the species which nest on Site. To enable an assessment of the potential effects of the Proposed Development upon nesting birds the suitability of habitat on Site to be used was assessed (during the extended Phase 1 habitat survey) and the results used to consider the bird community likely to be present. A precautionary approach has been taken, and where suitable habitat occurs it is assumed that species will be present for the purpose of this assessment. It should be noted that consequently, this assessment documents the greatest potential effects, and avoidance and mitigation measures have been designed accordingly. In practice measures

may actually deliver further ecological enhancement (in terms of habitat creation) where species are not currently present.

- N3.23 It should be noted that survey data received from third parties has not been verified by WSP|PB. Records held by local biological records centres are generally collected on a voluntary basis; therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage.

N4.0

Baseline Conditions

Existing Baseline

N4.1

This section contains a summary of baseline conditions informed by the results of the ecological desk study and extended Phase 1 habitat survey and external bat inspection.

Off-Site Habitats

Statutory Designated Sites

N4.2

Five statutory designated sites lie within 2km of the Site, some of which carry multiple designations (see Table N4.1); one further European designated site; Epping Forest Special Area of Conservation (SAC), lies within a 10km radius of the Site.

N4.3

The nearest statutory designated site is the Lee Valley, which is designated as an SPA and Ramsar on account of the assemblage of wildfowl present during the winter period, and the presence of rare plant and invertebrate species. The nearest component of the Lee Valley SPA/Ramsar is Walthamstow Reservoirs SSSI, these reservoirs are designated at a national level because they provide an important gathering area for moulting tufted duck *Aythya fuligula*, and for the range of wetland habitat types present in the relatively urban context. To the south of the Lee Valley SPA designation, a further area of wetland habitat is also designated as a SSSI; Walthamstow Marshes similarly on account of the wetland habitat types present.

N4.4

The other statutory sites listed, include Epping Forest SAC which lies over 4km to the east of the Site which is designated primarily for the beech woodland present, and Springfield Park which is designated at a local level (LNR) and lies approximately 1.8km to the south.

Non-Statutory Designated Sites

N4.5

A further fifteen non-statutory designated sites occur within 2km of the Ashley Road Masterplan Site; these comprise:

- One Site of Metropolitan Importance for Nature Conservation (SMINC); Lea Valley, located 300m east of the Ashley Road Masterplan Site and encompassing the Lee Valley SPA/Ramsar and adjacent SSSIs. This relatively large site supports a range of aquatic flora, avifauna, water vole *Arvicola amphibius*, great crested newt *Triturus cristatus* and fish;
- Three Sites of Borough Grade I Importance for Nature Conservation (SBINC I); the closest of which, Tottenham Marshes, is located approximately 450m north east of the Site. This is a large expanse of rough grassland with flora species which are nationally scarce and others which are uncommon in London;
- Four Sites of Borough Grade II Importance for Nature Conservation (SBINC II); the closest of which, Tottenham Railsides, is located approximately 50m to the east of the Ashley Road Masterplan Site. This is a willow woodland *Salix* spp. which is rare in London. It represents an important wildlife corridor from Lee Valley into the borough; and
- Seven Sites of Local Importance for Nature Conservation (SLINC); the closest of which, Down Lane Recreation Ground is located immediately north of the AG part of the Ashley Road Masterplan. The Down Lane Recreation Ground SLINC is designated for the native trees present including birch *Betula pendula*, hazel *Corylus avellana* and wild cherry *Prunus avium* and surrounding grassland areas which are managed for wildlife in part.

N4.6

Further information regarding non-statutory designated sites is provided in Appendix N1.

Table N4.1 Statutory Sites within 2km of the Ashley Road Masterplan (extended to 10km for European Sites)

Site Name	Designation	Proximity to Ashley Road Masterplan	Description
Lee Valley	SPA	456m E	Article 4.1 Qualification (79/409/EEC): Over winter the area regularly supports Eurasian bittern <i>Botaurus stellaris</i> (6% of the GB population (5 year mean 1992/93-1996/97) which equates to 6 birds. Article 4.2 Qualification (79/409/EEC): Over winter the area supports: - Northern shoveler <i>Anas clypeata</i> (1% of the north-western / central European population (5 year peak mean 1993/94-1997/98) which equates to 406 birds); and - Gadwall <i>Anas strepera</i> (1.5% of the population of the north-west European population (5 year peak mean 1993/94-1997/98) which equates to 456 birds). The reasons for designation for the Lee Valley SPA did not change following the SPA review (Ref. N.^{xxi}). This found no alteration in the number of bittern supported, though increases in shoveler and gadwall occurred, as listed below: - Northern shoveler, 748 individuals or 1.9% of the wintering North western/central European population (5 year peak mean 1991/2 - 1995/6); and 1991/2 - 1995/6); and - Gadwall, 515 individuals or 1.7% of the North western European population (5 year peak mean 1991/2 - 1995/6).
	RAMSAR	456m E	Ramsar Criterion 2: The site supports the nationally scarce plant species whorled water-milfoil <i>Myriophyllum verticillatum</i> and the rare or vulnerable invertebrate <i>Micronecta minutissima</i> (a water-boatman). Ramsar criterion 6: (species/populations occurring at levels of international importance) - Northern shoveler, 287 individuals representing an average of 1.9% of the GB population (5 year peak mean 1998/99-2002/03) - Gadwall, 445 individuals representing an average of 2.6% of the GB population (5 year peak mean 1998/99-2002/03)
Epping Forest	SAC	4360m E	Annex I habitats (primary reason for selection): Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrub layer (<i>Quercion roburipetraeae</i> or <i>Ilici-Fagenion</i>) Annex I habitats (present as qualifying features but not a primary reason for selection): Northern Atlantic wet heaths with <i>Erica tetralix</i>

Site Name	Designation	Proximity to Ashley Road Masterplan	Description
			- European dry heaths Annex II species (primary reason for selection): - Stag beetle <i>Lucanus cervus</i>
Walthamstow Reservoirs (also Lee Valley SPA and Ramsar)	SSSI	456m E	The Walthamstow Reservoirs contain one of the country's major heronries and a particularly large concentration of breeding wildfowl. They are also an important gathering area for moulting tufted duck <i>Aythya fuligula</i> and in winter attract nationally significant populations of wildfowl and other wetland birds. The shores of the reservoirs and the banks of the Coppermill Stream are of added interest for fringes of fenland vegetation containing species that are uncommon in Greater London. These include marsh-marigold <i>Caltha palustris</i>, the hybrid 'graceful' sedge <i>Carex x subgracilis</i>, common club-rush <i>Schoenoplectus lacustris</i> and a sizeable single species stand of lesser bulrush <i>Typha angustifolia</i>. In total nearly 300 species of plant have been recorded from the wooded areas, grass banks, fen and open water habitats of the reservoirs.
Walthamstow Marshes	SSSI	1741m S	Walthamstow Marshes are one of the last remaining examples of semi-natural wetland in Greater London. They contain a variety of plant communities typical of a former flood plain location, such as a range of neutral grassland types, sedge marsh, reed swamp, sallow scrub and areas of tall herb vegetation. Associated with this diversity of habitat are several species of plant and insect which are uncommon in the London area. The breeding bird community contains several species typically associated with marshland habitats such as reed bunting <i>Emberiza schoeniclus</i>, reed warbler <i>Acrocephalus scirpaceus</i>, sedge warbler <i>Acrocephalus schoenobaenus</i> and willow warbler <i>Phylloscopus trochilus</i>. A variety of wintering birds visit the marshes and neighbouring reservoirs while in autumn flocks of finches are to be found feeding on the seeds of the tall herbs.
Springfield Park	LNR	1842m S	Springfield Park consists of amenity grassland, areas of semi-improved grassland, acid and wet grassland, a strip of woodland, areas of formal planting, an ornamental duck pond and recreational facilities. The site was declared primarily of geomorphological grounds with an additional ecological interest. The LNR encompasses Springfield Park, Hackney (GLA43) potential Regionally Important Geological Site (RIGS) which has been identified by the London Geodiversity Partnership for its lithostratigraphy, sedimentology and geomorphology.

On-Site Habitats

- N4.7 The AG Site and Berol Yard (BY) Site within the Ashley Road Masterplan are dominated by buildings and hardstanding used for pedestrian and vehicular access and parking of limited intrinsic nature conservation value. Small areas of introduced shrub planting are present in association with existing buildings, and ephemeral vegetation is also present where undisturbed, bare substrate is present. Mature and semi-mature trees are present adjacent to but beyond the AG and BY application boundaries. These trees are included in Table N4.2 and Table N4.3 below because their root protection zones span the Sites. This includes trees within the Down Lane Recreation Ground SLINC which are located along the northern boundary of the AG Site. A stand of Japanese knotweed *Fallopia japonica* is present in the north eastern corner of the BY Site.
- N4.8 All habitat types recorded are widespread and readily established; they support common and widespread or non-native plant species. A list of habitats is provided in below, the area of each is provided in Table N4.2 and Table N4.3 alongside an evaluation of their nature conservation value.

Table N4.2 Summary and Evaluation of Habitats of the BY Site

Habitat Type	Area (ha) ² / Length (km)	Conservation Value	Description and Justification
Scattered Trees	0.00ha	Site	A line of hornbeam trees <i>Carpinus betulus</i> is present adjacent to the eastern boundary of the BY Site with a young cherry tree and small group of Leyland cypress <i>Cupressocyparis x leylandii</i> trees present in the south adjacent to Building B7 (a cafe). Although the trees are relatively small, their presence in the otherwise urban setting is of conservation value at the Site scale.
Ephemeral/Short Perennial Vegetation	0.03ha	Negligible	Small areas of ephemeral vegetation are present along the eastern edge of Building B7 (a cafe), along the southern aspect of Building B3 (Berol House) and along the southern and eastern boundaries of this area. Species include both native and non-native, opportunistic plants that quickly colonise habitat of this type. Vegetation is sparse (i.e. <5% of the area) and of no intrinsic nature conservation value.
Introduced Shrub Planting	0.00ha	Negligible	Patches of butterfly bush are present along the eastern boundary of the BY Site and a stand of Japanese knotweed is present in the north-eastern corner. This small area of habitat has very limited intrinsic value comprising fast growing, invasive species.

² Area rounded to two decimal places; where a habitat type covers <100m² it is shown as 0.00ha.

Habitat Type	Area (ha) ² / Length (km)	Conservation Value	Description and Justification
Buildings	0.32ha	Negligible	Five buildings are present on the BY Site of various construction types (B3-7). They have negligible intrinsic nature conservation value; their value as habitat to faunal species is evaluated below.
Hardstanding	0.45ha	Negligible	Hardstanding is of negligible conservation value.

Table N4.3 Summary and Evaluation of Habitats on the AG Site

Habitat Type	Area (ha) ³ / Length (km)	Conservation Value	Description and Justification
Scattered Trees (Tree line located within Down Lane Recreation Ground SLINC)	0.07ha	Local	The Down Lane Recreation Ground SLINC lies immediately north of the AG Site and consists of intensively managed amenity grassland with a number of mature and semi-mature planted trees. A line of mature lime <i>Tilia</i> sp. trees runs parallel to the northern boundary of the AG Site The SLINC is designated for the native trees present and surrounding grassland areas which are managed for wildlife in part. The line of mature lime trees contributes towards the complex of habitats present and, as part of the wider park is of nature conservation value at the Local scale.
Ephemeral/Short Perennial Vegetation	0.00ha	Negligible	A small area of ephemeral vegetation is present in the north-east of the AG Site. Species include both native and non-native, opportunistic plants that quickly colonise habitat of this type. Vegetation is sparse (i.e. <5% of the area) and of no intrinsic nature conservation value.
Introduced Shrub Planting	0.00ha	Negligible	A small patch of introduced shrub consisting of Virginia creeper <i>Parthenocissus</i> sp. has begun to grow on the fence (from adjacent land) on the western boundary. This single shrub is of no specific nature conservation value.
Buildings	0.76ha	Negligible	Two buildings are present on the AG Site which cover the majority of the land area (B1 and B2). They have negligible intrinsic nature conservation value; their value as habitat to faunal species is evaluated below.
Hardstanding	0.17ha	Negligible	Hardstanding is of negligible conservation value.

³ Area rounded to two decimal places; where a habitat type covers <100m² it is shown as 0.00ha.

Species

Bats

- N4.9 The majority of buildings on both the AG Site and BY Site were assessed to have negligible potential to support roosting bats due to an absence of suitable roosting features (B1, B3, B4, B5). These structures and the surrounding hardstanding habitats on Site are of negligible conservation value with respect to the local bat population.
- N4.10 Three of the buildings present were initially assessed to have low potential to support roosting bats (B2, B6 and B7), due to the presence of a small number of external features potentially suitable for use by roosting bats identified during the external building inspection from ground level. The subsequent detailed inspection including an at-height inspection of features on B6 and B7 and internal inspection of B2 enabled a more thorough assessment of the potential for bat roosts to be present. No evidence of use by bats was recorded and features present were found to be largely unsuitable for use by roosting bats due to their physical structure (i.e. shallow and exposed) and proximity to external light sources. The features on all three buildings were assessed as having negligible-low potential to be used by roosting bats (i.e. very low)⁴.
- N4.11 The line of lime trees immediately to the north of the Site (within Down Lane Recreation Ground SLINC), provides suitable bat foraging and commuting habitat. One of the trees present exhibits a rot hole/cavity assessed to have low potential to support a bat roost based on inspection from ground level. Some old wooden bat boxes (in a state of disrepair) are affixed to other trees in this tree line (to the west of the AG Site), none appeared to currently provide suitable conditions for roosting bats.
- N4.12 Overall habitat within the Down Lane Recreation Ground SLINC, adjacent to the AG Site is assessed to be of low suitability for foraging and commuting bats, due to the lack of connectivity to wider areas of more extensive foraging habitat. It is likely to be used by bat species tolerant of after-dark lighting and associated with roosts in built structures, enabling them to occur in urban environments. Species recorded in this situation are typically common and widespread species, such as the common pipistrelle *Pipistrellus pipistrellus*. The tree line, and Down Lane Recreation Ground SLINC as a whole, may also be used by higher flying species of bat such as noctule *Nyctalus noctula* and Leisler's *N. leisleri* that forage upon night-flying invertebrates drawn to after-dark lighting in urban areas.
- N4.13 Based on the geographic location, and habitat present in Down Lane Recreation Ground SLINC, the bat population which utilises this habitat (adjacent to the Site) is likely to be of conservation value at the Local scale.

Breeding Birds (Incl. Black Redstart)

- N4.14 The buildings, scattered trees and denser areas of introduced shrubs provide suitable habitat for nesting birds on the AG Site and BY Site. Generally, these habitats are suitable for widespread and common species of birds tolerant of urban environments and levels of disturbance (for example regular vehicular movements adjacent to buildings). The extent of suitable habitat on Site is limited compared to larger areas of habitat in the vicinity (for example, in comparison to Down Lane Recreation Ground SLINC to the immediate north, or the Lee Valley SPA <1km away to the east). It is reasonable to conclude that small numbers of common and widespread

⁴ Precautionary working methods are proposed as part of the suite of mitigation to be implemented as part of the Proposed Development to mitigate the negligible-low potential for a bat roost to be present.

species of birds are likely to nest on Site; this type of population would be of nature conservation value at the Site scale.

- N4.15 The Site also provides suitable nesting opportunities for black redstart. Most breeding records for this species in the UK are within urban areas or are associated with large scale built structures, such as power stations, gas works, dockyards and other industrial sites (Ref. N.xxii). Nests are usually constructed in holes or on internal ledges of buildings; derelict buildings in particular (Ref. N.xxiii). Buildings B1 (warehouse and offices) and B2 within the AG Site provide suitable nesting opportunities for this species, albeit sub-optimal, given that the buildings are still in current use and offer limited numbers of suitable nesting locations.
- N4.16 Although suitable foraging habitat for this species is limited on Site, extensive green/brown roofs are present (shown on aerial photography) approximately 100 m to the east of the Ashley Road Masterplan (on the Unite Students buildings and surrounding structures), which are likely to provide suitable foraging resource for this species.
- N4.17 The habitat on Site (and the wider Ashley Road Masterplan) would support a maximum of one breeding pair of black redstart.
- N4.18 Black redstart has been recorded previously within Haringey Borough (Ref. N.xxiv). In addition, this species has also been recorded since 1990 within all the adjoining six boroughs, with breeding records from four boroughs and regular breeding occurring within three of these (Islington, Hackney and Camden). The number of breeding pairs reported in London each year 2010-2014, is relatively low, with records of between 2-6 confirmed breeding pairs. It is notable however, that each year further singing males/pairs are recorded. For example in 2014 there were three breeding pairs confirmed, and a further 21 singing males, and it is noted that '*there may well have been further pairs as they can often be tricky to locate, particularly in the City of London where access is limited*' (Ref. N.xxv). In 2013, two breeding pairs were recorded with a further 19 singing males, with records from 40 sites outside Inner London throughout the course of the year which is an increase from 37 in 2012 and 21 in 2011 (Ref. N.xxvi). London remains a stronghold for the species, and generally the number of records has increased over the last ten years (Ref. N.xxvii)
- N4.19 Collectively, these reference sources indicate that although a rare breeding species within the UK, black redstarts are well distributed in north London and there are likely to be multiple breeding pairs within Haringey. The Ashley Road Masterplan provides suitable nesting opportunities for up to one breeding pair of black redstart; if present, the breeding pair would be of nature conservation value at the Borough scale.

Other Species (Species of Principal Importance)

- N4.20 Peripheral vegetation along the northern boundary of the AG Site, adjacent to Down Lane Recreation Ground SLINC provides suitable habitat for hedgehog *Erinaceus europaeus* which listed as a species of principal importance (SPI). The ecological desk study identified records of this species in the local area (<2km) within the last 10 years, and if present within the SLINC a population would be of conservation value at the Local scale given the surrounding urban environs.

Future Baseline

- N4.21 In the absence of redevelopment, there is no reason to believe that baseline conditions would alter greatly in the foreseeable future, though it is possible that buildings on Site will change use and state of repair. Changes to levels of use and disturbance on Site would influence the suitability of habitat to be used by fauna including nesting birds and bats.

Sensitive Features and Potential Effect Pathways

- N4.22 Table N4.4 overleaf lists potentially sensitive features identified during the baseline assessment, and summarises the scoping of potential effects which are taken forward in this EcIA.
- N4.23 It should be noted that effects upon the Lee Valley SPA and Ramsar, and its component SSSIs are not likely. The consideration regarding potential effects upon these designated areas is provided below in greater detail to justify this conclusion and to respond to the Scoping Opinion provided by LBH.

Lee Valley SPA and Ramsar

- N4.24 The increase in local population resulting from the Proposed Development in combination with other development locally, and the Walthamstow Wetlands Project which increases access to the Walthamstow Reservoir SSSI (a component of the Lee Valley SPA and Ramsar) could, in the absence of mitigation lead to significant negative effects upon the bird populations for which the SPA is designated.
- N4.25 The Walthamstow Wetlands Project is promoted in local planning policy (Ref. N.xxviii), and both the forthcoming local policy documents applicable to development in Haringey (Ref. N.xxix, N.xxx and N.xxxi), and Wetlands Project has been subject to independent assessment to assess the potential for significant effects upon the SPA and Ramsar (and with regard to the Wetlands Project the SSSI). The reporting to inform the Habitats Regulations Assessment (HRA) process for the Wetlands Project sets out predicted visitor numbers, taking into account planned increases in local residential accommodation, and describes how the project includes an adaptive access management strategy, informed by bird population monitoring data, to control access (and the associated risk of disturbance) at a level that does not significantly affect the bird populations present. For this reason, it is concluded that whilst new residents from the Proposed Development will visit the Walthamstow Reservoirs effects associated with recreational disturbance, are not likely to result in significant effects upon the SPA or Ramsar because an adaptive access management strategy, integral to the Wetlands Project, is in place to avoid this

Table N4.4 Scoping of Ecological Features for Inclusion in EclA

Feature	Nature Conservation Value of Feature	Scoping (In/Out)	Discussion and List of Potential Effect Pathways to be Considered
Lee Valley SPA and Ramsar	International	Out	Effects upon the Lee Valley SPA and Ramsar are not likely. The Ashley Road Masterplan and immediate surrounds provides no habitat suitable for the qualifying features of the SPA and Ramsar. The Proposed Development is also discrete in nature and entirely contained within the Ashley Road Masterplan which lies over 400m from the Lee Valley (separated by existing built development) therefore direct effects upon the reasons for designation are not likely. Whilst the bird species for which the Lee Valley is designated are susceptible to effects associated with increased recreational disturbance, the Proposed Development is not likely to contribute towards potential cumulative effects (alongside other residential developments and the Walthamstow Wetlands Project) for the reasons documented above.
Epping Forest SAC	International	Out	Epping Forest is located >4km from the Site and effects upon the reasons for designation are therefore concluded not likely.
Other Statutory Designated Sites (including Walthamstow Reservoirs SSSI)	National	Out	Effects upon the Walthamstow Reservoirs SSSI are not likely for the same reasons described above in relation to the Lee Valley SPA and Ramsar of which the SSSI is a component part. Other designated areas are >1500m from the Ashley Road Masterplan and therefore the Proposed Development is not likely to result in direct effects upon them, nor is the Proposed Development likely to result in indirect effects associated with recreational pressures due to the availability of other recreational resource on/nearer to the Site which will satisfy needs.
Non-Statutory Sites (Down Lane Recreation Ground SLINC)	Local	In	Down Lane Recreation Ground SLINC lies adjacent to the AG Site to the north. In the absence of mitigation, the Proposed Development could result in effects upon habitat within the SLINC therefore the assessment of potential effects upon the SLINC is scoped into this EclA. Consideration is made to the following potential effect pathways: - Habitat degradation resulting from overshadowing of trees and changes to hydrology affecting trees immediately adjacent to the AG Site during the operational phase; - Habitat degradation resulting from pollution (air quality) during the construction phase.
On Site Habitats	Negligible	In	No habitat currently present on either the AG Site or BY Site is of elevated nature conservation value. This feature is scoped into the EclA to enable positive changes in habitat provision on Site to be

Feature	Nature Conservation Value of Feature	Scoping (In/Out)	Discussion and List of Potential Effect Pathways to be Considered
			recognised and assessed.
Bats (roosting)	-	Out	The majority of structures on Site, and trees adjacent to the Site, have negligible potential to be used by roosting bats. Three of the buildings (B2, B6 and B7) were assessed to have negligible-low potential to be used by bats. Due to the high level of legal protection afforded to this species group and their roost sites precautionary working measures will be employed during the construction phase. It is however, concluded that roosting bats are highly unlikely to utilise the buildings as roost locations and therefore this feature is scoped out of this EclA.
Bats (foraging and commuting)	Local	In	Whilst the AG Site and BY Site are of negligible suitability for foraging and commuting bats, to the immediate north the Down Lane Recreation Ground SLINC provides suitable foraging and commuting habitat and the bat population which utilises this habitat is likely to be of conservation value at the Local scale. The Proposed Development has potential to affect bat activity in the immediate vicinity, therefore assessment of potential effects upon foraging and commuting bats is scoped into this EclA. Consideration is made to the following potential effect pathways: - Habitat degradation resulting from changes in after-dark light levels during the construction and operational phases; and - Habitat degradation/enhancement resulting from changes in habitat on Site during the construction and operational phases (i.e. any necessary tree removal, and the establishment of new soft landscaping associated with Proposed Development).
Nesting Birds (incl. Black Redstart)	Up to Borough	In	The AG Site and BY Site in combination provide suitable nesting opportunities for up to one breeding pair of black redstart; if present, the breeding pair would be of nature conservation value at the Borough scale. On a precautionary basis, to ensure that avoidance and mitigation measures are fully incorporated into the Proposed Development, effects upon nesting birds are scoped into this EclA. Consideration is made to the following potential effect pathways: - Loss of individuals (injury and mortality) during site clearance; and - Habitat degradation/enhancement resulting from changes in habitat on Site during the construction and operational phases (i.e. demolition and any necessary tree removal, and the establishment of new soft landscaping and habitat creation associated with Proposed Development).

N5.0

Potential Effects

N5.1

The Proposed Development includes two planning application components; the AG development (outline), the BY Development (hybrid). For the purpose of this assessment three scenarios are referenced:

- 1) The AG development and the BY development;
- 2) The AG development without the BY development; and
- 3) The BY development without the AG development.

N5.2

In all cases, likely effects of the Proposed Development as a whole are considered (the first scenario) followed by any differences applicable to the other scenarios (the second and third scenario).

During Construction

Non-Statutory Sites (Down Lane Recreation Ground SLINC)

N5.3

In the absence of mitigation there is potential for pollution events during the construction phase which would result in negative effects upon the Down Lane Recreation Ground SLINC, immediately adjacent to the AG Site, which is of conservation value at the Local scale. This could entail dust pollution which could cause temporary damage to trees for which the SLINC is designated, reducing their capacity for photosynthesis through damage to foliage. The demolition and construction programme is approximately three years in duration, with a further six to twelve months for fitting out (including all components of the Proposed Development); with construction commencing during 2018 and all components being occupied by February 2022.

N5.4

Temporary, short term, negative effects upon the SLINC would occur in the absence of mitigation. Effects would be reversible, and of significance at the Site scale only.

N5.5

The effects would be associated with scenarios 2a and 2b given the proximity of the AG Site to the SLINC; in scenario 2c no significant effects would be anticipated.

On Site Habitat

N5.6

Habitat on the AG Site and BY Site is not of intrinsic nature conservation value, comprising buildings and hardstanding in the main. Invasive species are present however, and in the absence of control measures, there is potential for negative effects resulting from the spread of dominant non-native species including Japanese knotweed.

N5.7

The spread of Japanese knotweed would result in permanent, long-term effects in the absence of control measures as this plant is likely to persist and expand without intervention. Effects would be reversible through treatment and of significance at the Site scale only.

N5.8

Japanese knotweed is present on the north-eastern boundary of the BY Site therefore effects are associated with scenarios 2a and 2c; in scenario 2b no significant effects would be anticipated.

Bats (foraging and commuting)

N5.9

Existing habitat suitable for use by foraging and commuting bats, notably the line of lime trees to the north of the AG Site, is retained in the Proposed Development. In the absence of mitigation, this retained habitat could be detrimentally affected through changes to after-dark

lighting. Given the urban location of the AG Site and current active use, levels of lighting are not likely to alter significantly but the location of light sources may change.

- N5.10 Temporary, short term, negative effects upon the local bat population (foraging and commuting) could occur in the absence of mitigation. Effects would be reversible, and of potential significance at the Site scale only.
- N5.11 The effects would be associated with scenarios 2a and 2b given the proximity of the AG Site to the tree line to the north which forms part of the adjacent SLINC; in scenario 2c no significant effects would be anticipated because habitats present are largely unsuitable for foraging bats.

Nesting Birds (incl. Black Redstart)

- N5.12 Habitat on the AG Site and BY Site is suitable for use by nesting birds, including black redstart. In the absence of mitigation, demolition and construction activities could disturb and damage active birds' nests.
- N5.13 With respect to widespread and common species likely to nest on the AG Site and BY Site, such as feral pigeon and blackbird, whilst these impacts should be avoided (to ensure compliance with relevant legislation), they would not be of significance at above Site scale. The damage and/or destruction of nesting locations would result in permanent, short term, negative effects upon the bird population on the AG Site and BY Site. The effects would be irreversible with respect to individual animals, however considering the local bird population as a whole, reversible in so far as subsequent provision of new habitat is likely to enable the population to recover from small losses.
- N5.14 In relation to black redstart; if a pair breed on the AG Site (or Ashley Road Masterplan as a whole), the population present would be of conservation value at the Borough scale. Damage to, or disturbance of the nest at levels reducing likely survival rates, in addition to the removal of suitable nesting locations would result in permanent, long term, negative effects significant at the Borough scale. The effects to individual animals would be irreversible, and the likelihood of re-colonisation following the creation of replacement habitat limited.
- N5.15 Both the AG Site and BY Site provide some, albeit limited opportunities for nesting birds; if present the effects are likely to be similar irrespective of the development scenario (2a, 2b or 2c).

During Operation

Non-Statutory Sites (Down Lane Recreation Ground SLINC)

- N5.16 The Proposed Development will not lead to any further effects upon the Down Lane Recreation Ground SLINC during the operational phase. This is because the SLINC comprises amenity grassland, shrub and tree cover which are not particularly sensitive to changes in recreational pressure and already managed to accommodate recreational use.

On Site Habitats

- N5.17 The Proposed Development includes landscaping at ground level and at height in the form of new rooftop areas (both private and combined with photovoltaic energy generation). The creation of new semi-natural habitats will exceed the area of ephemeral/short perennial vegetation and introduced shrub removed to facilitate development and is likely to result in permanent, long term, positive effects upon biodiversity significant at the Site scale.

- N5.18 In the absence of design principles to ensure that the design and future management of habitats is specifically intended to benefit biodiversity, the opportunity to generate positive effects may not be fully realised.

Bats (foraging and commuting)

- N5.19 After dark lighting during the operational phase of the Proposed Development could detrimentally affect retained habitat adjacent to the AG Site, and reduce the suitability of newly created habitat, for use by foraging and commuting bats within the Ashley Road Masterplan. Given the urban location of the AG Site and BY Site, and current active use, levels of lighting during the operational phase are not likely to alter significantly from pre-development levels but the location of light sources may change. Permanent, long term, negative effects upon the local bat population (foraging and commuting) could occur in the absence of mitigation. Effects would be reversible, and of potential significance at the Site scale only.
- N5.20 The effects would mainly be associated with scenarios 2a and 2b given the proximity of the AG Site to the SLINC to the north which provides a larger area of suitable bat foraging habitat; in scenario 2c lighting may reduce the benefits otherwise achieved through creation of new semi-natural habitats within the BY Site however this is not likely to be significant given the lack of suitable habitat pre-development.

Nesting Birds (incl. Black Redstart)

- N5.21 During the operational phase, in the absence of measures to provide habitat for this species, there will be no further effects upon the local population.

Summary of Potential Effects Prior to Mitigation

- N5.22 **Error! Not a valid bookmark self-reference.** below provides a summary of the potential effects of the Proposed Development prior to the implementation of mitigation.

Table N5.5 Summary of Potential Effects Prior to Mitigation

Scenario/Feature	1) The AG development and the BY development;	2) The AG development without the BY development	3) The BY development without the AG development
During Construction			
Non-Statutory Sites (Down Lane Recreation Ground SLINC)	Temporary, short term, negative effects upon the SLINC would occur in the absence of mitigation. Effects would be reversible, and of significance at the Site scale only.		No significant effect.
On Site Habitat	The spread of Japanese knotweed would result in permanent, long-term effects in the absence of control measures as this plant is likely to persist and expand without intervention. Effects would be reversible through treatment and of significance at the Site scale only.	No significant effect.	The spread of Japanese knotweed would result in permanent, long-term effects in the absence of control measures as this plant is likely to persist and expand without intervention. Effects would be reversible through treatment and of significance at the Site scale only.
Bats (foraging and commuting)	Temporary, short term, negative effects upon the local bat population (foraging and commuting) could occur		No significant effect.

Scenario/Feature	1) The AG development and the BY development;	2) The AG development without the BY development	3) The BY development without the AG development
	in the absence of mitigation. Effects would be reversible, and of potential significance at the Site scale only.		
Nesting Birds (incl. Black Redstart)	The damage and/or destruction of nesting locations would result in permanent, short term, negative effects upon the bird population on the AG Site and BY Site. The effects would be irreversible with respect to individual animals, however considering the local bird population as a whole, reversible. In relation to black redstart; if a pair breed on the AG or BY Sites (or Ashley Road Masterplan Site as a whole) damage to, or disturbance of the nest at levels reducing likely survival rates, in addition to the removal of suitable nesting locations would result in permanent, long term, negative effects significant at the Borough scale. The effects to individual animals would be irreversible, and the likelihood of re-colonisation following the creation of replacement habitat limited.		
During Operation			
Non-Statutory Sites (Down Lane Recreation Ground SLINC)	No significant effect.		
On Site Habitat	The creation of new semi-natural habitats will exceed the area of ephemeral/short perennial vegetation and introduced shrub removed to facilitate development and is likely to result in permanent, long term, positive effects upon biodiversity significant at the Site scale.		
Bats (foraging and commuting)	Permanent, long term, negative effects upon the local bat population (foraging and commuting) could occur in the absence of mitigation. Effects would be reversible, and of potential significance at the Site scale only.		No significant effect.
Nesting Birds (incl. Black Redstart)	No significant effect.		

N6.0 **Mitigation and Monitoring**

During Construction

Non-Statutory Sites (Down Lane Recreation Ground SLINC)

N6.1 Down Lane Recreation Ground SLINC lies immediately to the north of the AG Site. Trees within the SLINC will be retained and protected during the construction phase in line with measures set out in the detailed arboriculture report (Ref. N.^{xxxii}) to include the installation of tree protection fencing, the use of ground protection during works and the use of no dig construction techniques for replacement hard surfacing within the root protection zone.

N6.2 In the absence of avoidance and mitigation measures, the SLINC could also be affected by pollution events such as changes in air quality (dust pollution) and surface water run-off (potentially containing pollutants) during construction. To prevent this, appropriate pollution prevention controls will form part of the Demolition and Construction Method Statements to avoid, and minimise the risk of pollution incidents. This will include measures to:

- minimise and where possible prevent noise and dust pollution during demolition works (see also Chapters J and K); and
- ensure that fuel and other chemicals are appropriately stored and measures are put in place to prevent spillages.

On Site Habitats (Japanese knotweed)

N6.3 The BY Site includes a small stand of support invasive plant species which must not be spread as a result of demolition and construction activities on Site. Measures to prevent the spread of Japanese knotweed will be incorporated into the Demolition and Construction Method Statements. This will include:

- isolation of the Japanese knotweed from the demolition and construction works area; and
- treatment in line with methods prescribed by an appropriately trained and experienced specialist (most likely to include herbicide treatment or physical removal and disposal).

Bats (foraging and commuting)

N6.4 The Proposed Development includes the retention and protection of all mature trees to the north of the AG Site which provide suitable habitat for foraging and commuting bats. Measures will be in line with BS5837:2012 and include:

- erection of stout fencing around each tree/tree group in advance of demolition/construction activities, enclosing the Root Protection Area;
- prohibition of construction activities, material storage, use of vehicles, fires, etc. within the fenced area to prevent damage to tree roots and compaction of the soil; and
- maintenance of an adequate water supply to the trees both during and after construction.

N6.5 In addition, measures will be taken to avoid increases to after-dark lighting during the construction phase which could otherwise affect bat activity.

N6.6 Standard working hours will be 08:00-18:00 on weekdays and 08:00-13:00 on Saturdays with the majority of works occurring during these periods. Any necessary night time lighting, for example security lighting, will be designed to avoid light spill onto retained semi-natural vegetation (to include the line of limes to the northern boundary of the AG Site).

- N6.7 Only specific activities that cannot be reasonably completed during the daytime will occur outside standard hours. Given the short term nature of these activities, specific mitigation to control lighting is not considered necessary.

Nesting Birds (incl. Black Redstart)

- N6.8 Strip out and demolition will occur sequentially for different components of the Proposed development; with the BY Site including demolition activities between January 2018 and January 2022, and the AG Site including demolition activities from August 2018 to approximately September 2019. Once activities have commenced there will be significant levels of disturbance within the Ashley Road Masterplan area.
- N6.9 If possible, activities will commence during the winter period outside the main nesting bird season (i.e. works will commence between September to February inclusive). If this is not possible, vegetation clearance and building demolition will be completed only following checks by a suitably qualified ecologist to confirm the absence of nesting birds. In the event that active nests are identified at this stage, works which would otherwise risk damaging the active nest will be postponed until the nest is no longer active (i.e. the young have fledged).
- N6.10 A survey to confirm the presence or absence of black redstart from the Ashley Road Masterplan area will occur during Spring 2017. The results of this survey will inform detailed measures to be incorporated in the Demolition and Construction Method Statements. If the species is confirmed to be nesting, this may include commencing demolition later in the year (i.e. September/October) to avoid the risk of disturbance to adult birds at the nest and their young.

During Operation

On Site Habitats

- N6.11 The extent of landscaping within the Ashley Road Masterplan will increase as a result of the Proposed Development.
- N6.12 Within the BY Site this will include:
- 758m² predominately soft landscaping (to include retained trees); and
 - 470m² landscaped roof space/green roofs⁵ (to include accessible and non-accessible, excluding photovoltaic provision; there will be approximately 100m² photovoltaic provision which may be set above landscaped roof area).
- N6.13 Within the AG Site this will include:
- 356m² predominately soft landscaping (to include retained trees); and
 - 571m² predominately landscaped private/communal space; and
 - 1271m² landscaped roof space/green roofs (to include accessible and non-accessible, excluding photovoltaic provision; there will be approximately 200m² photovoltaic provision which may be set above landscaped roof area).
- N6.14 The biodiversity benefit of these spaces will be maximised through the following key design principles:
- native plant species and/or those with proven wildlife benefit will be preferentially included in the planting schedules for the Site (to include species with extended flowering and fruiting seasons);

⁵ Including podium level planting for Building 1

- a range of plant types will be incorporated to provide a varied vegetation structure to include trees, shrubs, ground cover and climbers; and
- features such as invertebrate boxes, and deadwood will be incorporated into designs where possible to provide microhabitats for invertebrates.

N6.15 During operation, these spaces will be managed both to increase biodiversity and ensure landscaping functions as intended, as a key component of the public realm. This will include measures to ensure planting becomes established (or is replaced as necessary), and future management promotes healthy plant growth (for example through pruning and removal of waste material, and use of mulch and fertilisers as appropriate). Measures will be set out in a Landscape Management Plan to be submitted as part of the future, detailed planning application for outline components of the Proposed Development.

Bats (foraging and commuting)

N6.16 The Proposed Development will benefit commuting and foraging bats through creation of new, habitat capable of supporting an increased abundance of invertebrate prey. This is described under On Site Habitats above.

Nesting Birds (incl. Black Redstart)

N6.17 Structures suitable for use by nesting birds will be removed during demolition and construction, designs will include habitat creation to mitigate for this and enhance habitat provision within the Ashley Road Masterplan.

N6.18 This will include nesting habitat to include:

- two nest boxes to increase the availability of nesting sites specifically suited to black redstart, such as the open fronted woodcrete box (2HW) or nesting brick type (No24) produced by Schwegler. Nest boxes will be located in proximity to the brown roofs, which typically will be greater than 25m above ground. The stepped nature of buildings will also naturally provide a variety of ledges and open song posts 20m or greater above the ground level and with no/limited public access;
- three nest boxes designed to accommodate starlings, such as those with an access hole 45mm in diameter, will be secured to retained lime trees to the north of the AG Site

N6.19 The landscaped roof space for Building 4 of the BY Site will also be designed to increase the extent of foraging habitat suitable for black redstart. This will include brown roof, which will:

- comprise aggregate mix ideally generated during demolition to reuse material (this would be a mixture of crushed brick and concrete graded from 25mm to dust);
- be contoured from heights of 5cm to 15cm; and
- be allowed to become colonised by vegetation and invertebrate species naturally (i.e. not be seeded or covered with sedum matting).

N6.20 These areas will be located beyond the accessible roof space, and outside private ownership to prevent future modification/disturbance.

N7.0 Residual Effects

During Construction

Non-Statutory Sites (Down Lane Recreation Ground SLINC)

- N7.1 Through the implementation of measures to avoid potential pollution events, residual effects upon the Down Lane Recreation Ground SLINC during construction will be negligible during the construction phase.

On Site Habitats (Japanese knotweed)

- N7.2 Through implementation of measures to control the spread of invasive species residual effects upon on site habitats will be negligible during the construction phase.

Bats (foraging and commuting)

- N7.3 As a result of the retention and protection of retained foraging and commuting habitat (line of lime trees to the north of the AG Site), and controls upon after dark lighting, effects upon the local bat population will be negligible during the construction phase.

Nesting Birds (incl. Black Redstart)

- N7.4 The seasonal timing of demolition works, or completion of pre-works checks with appropriate measures should nests be present, will minimise direct effects upon common and widespread nesting birds during the construction phase. Effects upon the birds present will therefore be negligible, and individual animals may be displaced to nearby alternative habitat (for example in the form of residential properties and gardens nearby).
- N7.5 Similarly, through appropriate seasonal timing of works, and necessary pre-works checks, direct effects upon black redstart (if present) will be avoided. During the construction phase suitable nesting habitat currently present will however, still be removed and remain unavailable for approximately 12-24 months in each component of the Proposed Development. This equates to the removal of a proportion of nesting resource for one, or possibly two breeding seasons. Should this habitat be used by nesting black redstarts, this would result in a residual temporary, medium term (duration of construction), negative effect upon the population present. The effect of a temporary reduction in nesting habitat could have effects of significance at the Borough scale if this displaces breeding black redstart. The effect would be reversible however, and in the long term (during the operational phase) the residual effect would be negligible as a result of provision of enhanced foraging habitat and nesting resource.

During Operation

On Site Habitats

- N7.6 During the operational phase, the extent of semi-natural habitat on Site will be substantially greater than conditions pre-development. The new landscaping will be designed and managed to both benefit biodiversity and ensure landscaping functions as intended, as a key component of the public realm. This will generate permanent, long term, positive effects upon biodiversity significant at the Site scale. It may also contribute towards an effect of greater significance cumulatively with other developments locally.

Bats (foraging and commuting)

- N7.7 During the operational phase, the extent of semi-natural habitat on both the AG and BY Site will be substantially greater than conditions pre-development and this will provide increased suitable foraging and commuting habitat for bat species. The habitat will include tree, shrub and ground cover planting providing a structurally diverse habitat supporting a variety of invertebrate species.
- N7.8 This will generate permanent, long term, positive effects upon the local bat population significant at the Site scale. It may also contribute towards an effect of greater significance cumulatively with other developments locally.

Nesting Birds (incl. Black Redstart)

- N7.9 During the operational phase, habitat provision for nesting birds including black redstart will be enhanced compared to baseline conditions. Negative effects during construction, resulting from reduced availability of habitat, will be reversed. The Site will provide sufficient habitat for an increased number of breeding pairs of common and widespread species, it will also provide both foraging and nesting habitat capable of supporting a pair of black redstarts.
- N7.10 Habitat creation will generate permanent, long term, positive effects upon the local breeding bird population significant at the Site scale. It may also contribute towards an effect of greater significance cumulatively with other developments locally.

Summary of Residual Effects Following Mitigation

- N7.11 Table N7.6 below provides a summary of the residual effects of the Proposed Development following the implementation of mitigation.

Table N7.6 Summary of Potential Effects Prior to Mitigation

Scenario/Feature	1) The AG development and the BY development;	2) The AG development without the BY development	3) The BY development without the AG development
During Construction			
Non-Statutory Sites (Down Lane Recreation Ground SLINC)	No significant effect.		
On Site Habitat	No significant effect.		
Bats (foraging and commuting)	No significant effect.		
Nesting Birds (incl. Black Redstart)	The effect of a temporary reduction in nesting habitat could have effects of significance at the Borough scale if this displaces breeding black redstart. The effect would be reversible however, and in the long term (during the operational phase) the residual effect would be negligible as a result of provision of enhanced foraging habitat and nesting resource.		
During Operation			
Non-Statutory Sites (Down Lane Recreation Ground SLINC)	No significant effect.		
On Site Habitat	Habitat creation will generate permanent, long term, positive effects upon biodiversity significant at the Site scale		

Scenario/Feature	1) The AG development and the BY development;	2) The AG development without the BY development	3) The BY development without the AG development
Bats (foraging and commuting)	Habitat creation will generate permanent, long term, positive effects upon the local bat population significant at the Site scale.		
Nesting Birds (incl. Black Redstart)	Habitat creation will generate permanent, long term, positive effects upon the local breeding bird population significant at the Site scale.		

N7.12

N8.0 Summary & Conclusions

- N8.1 Both the AG Site and BY Site are predominantly comprised of hard standing and buildings, with some small areas of ephemeral/short perennial vegetation present and introduced shrub in association with existing buildings.
- N8.2 The habitats present within the Sites are of negligible intrinsic conservation value, however they provide suitable habitat for certain species of up to Borough conservation value (black redstart) and species for which associated legislation is relevant to the Proposed Development (nesting birds and Japanese knotweed). Evidence is not available confirming the presence or absence of black redstart, the design of mitigation and this assessment has been completed on the basis that up to one breeding pair may use habitat within the Ashley Road Masterplan area.
- N8.3 To the immediate north of the AG Site lies the Down Lane Recreation Ground Site of Local Importance for Nature Conservation (SLINC) which is of conservation value at the Local scale. The Down Lane Recreation Ground comprises amenity grassland, shrubs and mature trees. It provides suitable foraging/commuting habitat for bats and potential effects upon this species group are assessed in this EcIA. A proportion of buildings on the BY Site and AG Site have very low potential to support roosting bats; precautionary working methods are proposed to ensure compliance with legislation protecting this species group.
- N8.4 In the absence of mitigation, if construction on the AG Site generates pollution (such as dust deposition or run-off) the Proposed Development would have temporary, short term, negative effects upon the Down Lane Recreation Ground SLINC. Effects would be reversible, and of significance at the Site scale only. Pollution prevention measures will however be incorporated into Demolition and Construction Method Statements to avoid the risk of pollution events, and therefore residual effects upon the SLINC will be negligible.
- N8.5 Whilst on-site habitats are currently of limited intrinsic value, changes to on-site habitat are assessed in this EcIA because in the absence of control measures development of the BY Site could spread Japanese knotweed, and because the Proposed Development includes a substantial proportion of landscaping which will generate positive effects upon biodiversity. Control measures will be implemented to avoid the spread of Japanese knotweed during the construction phase on the BY Site. In combination the Proposed Development includes 1685m² landscaping at ground level (including soft landscaping and predominately landscaped private areas) and 1741m² green/brown roofs (total including accessible and non-accessible). This will generate permanent, long term, positive effects upon biodiversity significant at the Site scale. It may also contribute towards an effect of greater significance cumulatively with other developments locally.
- N8.6 The tree line to the north of the AG Site, within the Down Lane Recreation Ground will be retained and protected as part of the Proposed Development. This will avoid effects upon the SLINC and upon foraging and commuting bats which may utilise this habitat. In addition, lighting will be controlled during construction and designs for the Proposed Development follow key principles to avoid light spill upon semi-natural habitats to avoid influencing bat behaviour. As a result, residual effects upon the local bat population during construction will be negligible, and habitat creation is likely to generate permanent, long term, positive effects upon the local bat population significant at the Site scale during the operational phase.
- N8.7 Habitat on Site is suitable for use by nesting birds, including black redstart. In the absence of mitigation, demolition and construction activities could disturb and damage active birds' nests. If black redstart were to be nesting at the time of works damage to, or disturbance of the nest at levels reducing likely survival rates, in addition to the removal of suitable nesting locations

would result in permanent, long term, negative effects significant at the Borough scale. To avoid direct effects upon nesting birds Demolition and Construction Method Statements will include seasonal restrictions to certain activities, and/or checks to ensure that no active birds' nests are affected by the Proposed Development. In addition mitigation measures to replace and enhance habitat for nesting birds, with specific provisions for black redstart, have been incorporated into the Proposed Development. There will be a reduction in habitat available to nesting birds during the construction period (3 years) prior to new, enhanced habitat becoming fully available. The effect of a temporary reduction in nesting habitat could have effects of significance at the Borough scale if this displaces breeding black redstart. The effect would be reversible however, and in the long term (during the operational phase) the residual effect of habitat creation and enhancement will generate permanent, long term, positive effects upon the local breeding bird population significant at the Site scale.

N8.8 Though temporary effects during the construction period are anticipated with respect to nesting birds, the mitigation and enhancement measures proposed are considered sufficient to enable the Proposed Development to proceed in accordance with applicable legislation and planning policy. In the longer term the Proposed Development will generate permanent, long term, positive effects upon multiple ecological features significant at the Site scale.

N9.o

Abbreviations & Definitions

HPI	Habitat of Principal Importance; listed in response to requirements of the Natural Environment and Rural Communities Act 2006
NERC Act	Natural Environment and Rural Communities Act 2006
Ramsar	Area designated under The Convention on Wetlands
SINC	Site of Importance for Nature Conservation
SLINC	Site of Local Importance for Nature Conservation
SPA	Special Protection Area
SPI	Species of Principal Importance; listed in response to requirements of the Natural Environment and Rural Communities Act 2006
SSSI	Site of Special Scientific Interest

N10.0

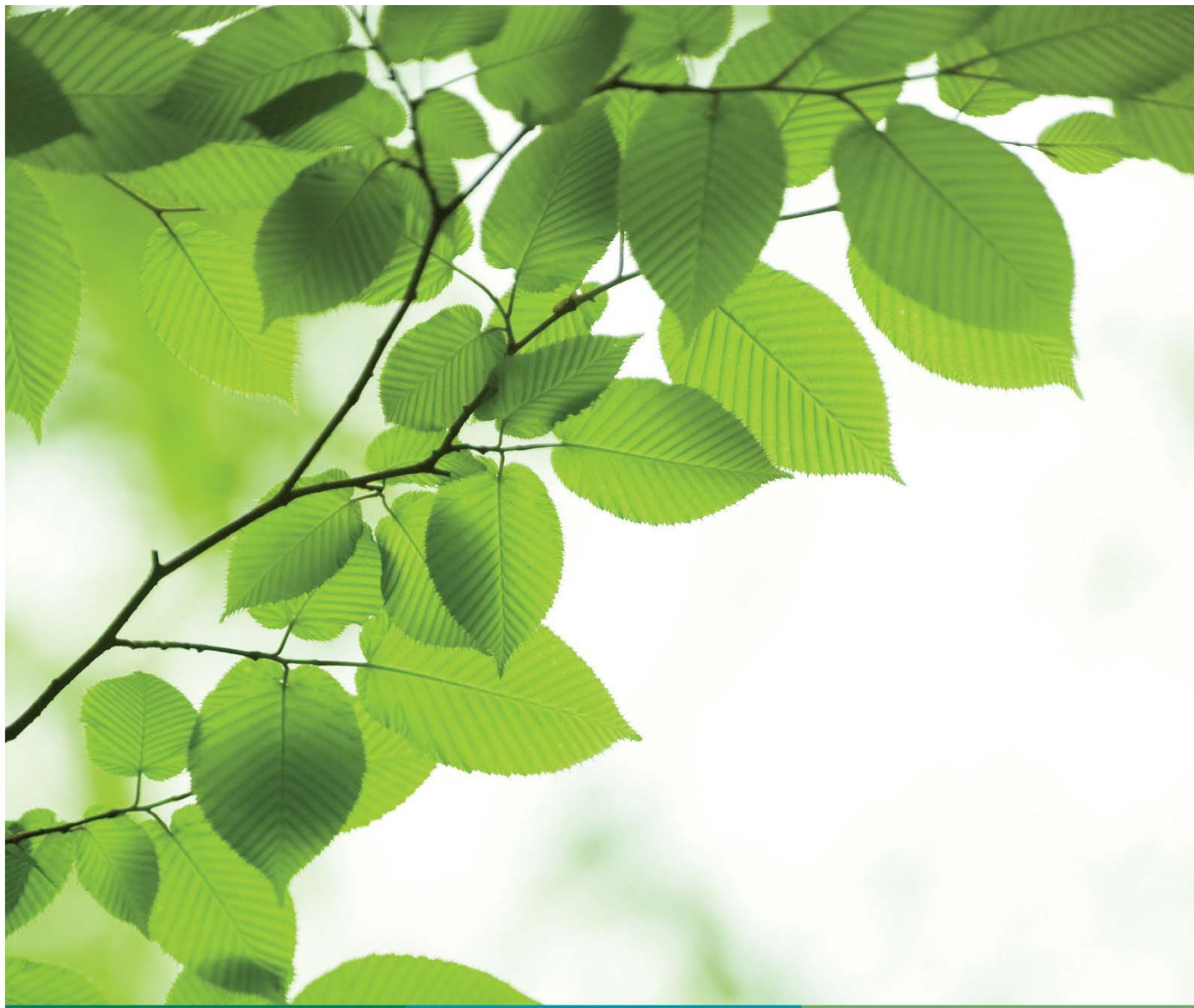
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**Appendix 6 Ground Contamination report
submitted for application ref.
HGY/2017/2044**



Geo-Environmental Assessment

Berol's Yard, Ashley Road, Tottenham

Presented to Toureen Contractors Ltd

Issued: June 2018

Delta-Simons Project No. 18-0192.01



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A member of

Report Details

Client	Toureen Contractors Ltd
Report Title	Geo-Environmental Assessment
Site Address	Berol's Yard, Ashley Yard, Tottenham, N17 9LJ
Project No.	18-0192.01
Report Date	June 2018
Delta-Simons Contact	John Rhoades (john.rhoades@deltasimons.com)

Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
1	Final	25 th April 2018	-			
2	Final	15 th June 2018	Minor text amends to include Planning reference	Harry Whittle Consultant	John Rhoades Principal	Simon Clennell-Jones Divisional Director

About us

Delta-Simons is a trusted, multidisciplinary environmental consultancy, focused on delivering the best possible project outcomes for customers.

Specialising in Environment, Health & Safety and Sustainability, Delta-Simons provide support and advice within the property development, asset management, corporate and industrial markets. Operating from nine locations - Lincoln, Birmingham, Dublin, Durham, Leeds, London Manchester, Norwich and Nottingham, - we employ over 75 environmental professionals, bringing experience from across the private consultancy and public sector markets.

Delta-Simons is proud to be a founder member of the Inogen® Environmental Alliance, enabling us to efficiently deliver customer projects worldwide by calling upon over 4,330 resources in our global network of consultants, each committed to providing superior EH&S and sustainability consulting expertise to our customers. Inogen Environmental Alliance offers its clients more consultants, with more services in more countries than the traditional multinational consultancy.

Executive Summary

Brief	Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Soil and Water Solutions Ltd on behalf Toureen Contractors Ltd the "Client" to prepare a Geo-Environmental Assessment for Berol's Yard, Ashley Road, Tottenham, N17 9LJ (hereafter referred to as the 'Site'). A planning application for a mixed-use redevelopment, including retention of the historical factory building and development of new college and residential blocks (with ground floor commercial uses) is currently pending decision. The purpose of this assessment is to identify the potential for land contamination issues to be present at the Site in the context of the proposed development, to support the planning application and to provide a geotechnical assessment.
Site Setting	The Site was historically occupied by a pencil factory, later a works and various commercial and office uses. At the time of the investigation the Site was undergoing demolition and clearance to ground level.
Ground Conditions	The current ground investigation recorded a variable thickness of Made Ground to a maximum depth of 2.2 m bgl, which is in turn underlain by the Enfield Silt Member, Kempton Park Gravels, London Clay and the Lambeth Group. Groundwater was encountered from approximately 1.7 m bgl.
Land Contamination Assessment	<i>Human Health</i> Widespread or significant contamination of the Site has not been identified, though asbestos and localised, low level lead and PAHs have been identified in the Made Ground. Based on the available information, potential risks to human health can be mitigated though the development with the provision of hardcover over the majority of the completed development. Certified, imported 'clean' cover soils should be allowed for in any landscaped areas. Groundworkers will need to be aware of and allow for addressing asbestos finds in the ground if/when encountered. <i>Controlled Waters</i> No potential risk to controlled waters has been identified, given the absence of significant potentially mobile contamination sources and distance to controlled water receptors. <i>Ground Gas</i> Ground gas monitoring indicates the Site can be classified as CS1, specific ground gas protection measures are not considered to be required.
Geotechnical Assessment	On the basis of the information obtained and reviewed as part of this assessment, Delta-Simons makes the following geotechnical recommendations. ▲ For preliminary design purposes, assuming that groundwater would be adequately controlled, trench fill foundations founding on the Kempton Park gravels may achieve an allowable bearing capacity of 250 kPa (limited to less than 25 mm settlement); ▲ The depth and distribution of Made Ground will likely preclude the use of ground bearing floor slabs; ▲ Due to the expected high design loads, a piled foundation solution using continuous flight auger (CFA) piles transferring loads to competent geology may be suitable for the proposed development; ▲ The precise method of pile installation and applicability of proprietary systems, diameters and depths required and risk assessment in conjunction with TFL for

	LUL would need to be informed based on the results of this investigation, by discussions with a piling contractor; ▲ There will be a requirement for the placement of a suitably engineered piling mat, which should be designed and validated by a suitably experienced engineer; ▲ It is recommended that a conservative CBR value of 2% should be adopted for the shallow soils for preliminary pavement design and it is recommended that plate CBR tests are undertaken at formation level after demolition prior to finalising pavement design; ▲ Shallow groundwater is likely to be encountered in any excavations and trenches which penetrate the Kempton Park Gravels, as such excavations and trenches may require appropriate groundwater control; ▲ The conditions of the Made Ground and superficial deposits at the Site in accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' 2005, would be classified as Design Sulphate Class DS-2 and ACEC Class AC-2 for soils and groundwater. Piling is not generally considered to result in disturbed ground (BRE SD1 – Appendix A), therefore, any pyrite is unlikely to be oxidised. As such, consideration can be given to water soluble sulphate content of the London Clay (BRE SD1 – Box C8), which in this case would result in a DS-2 classification based on the results contained; and ▲ The depth and distribution of Made Ground across the site will likely preclude the use of traditional spread foundations and ground bearing floor slabs.
Recommendations	Based on the findings of this Assessment, further Site investigation, detailed risk assessment or specific remediation are not considered to be required. The following general recommendations for future development works are made: ▲ Future groundworks and piling contractors should make their own assessment of UXO risk in relation to their specific scope of works; ▲ Groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks and in particular the potential presence of asbestos and an appropriate protocol to mitigate exposure of the workforce and general public during development earthworks should be in place; and ▲ A protocol for unexpected finds as well as safe working procedures such as damping down of excavations and stockpiles in line with general dust generation mitigation. The risk assessment will need to identify the appropriate levels of PPE and/or RPE required. This recommendation should be captured in Site health and safety documentation and in maintenance plans.
This is intended as a summary only. Further detail and the limitations of the assessment are provided within the main body of the Report.	

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1.0 Introduction

1.1 Appointment

Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Soil and Water Solutions Ltd on behalf Toureen Contractors Ltd the "Client" to prepare a Geo-Environmental Assessment for Berol's Yard, Ashley Road, Tottenham, N17 9LJ (the "Site"). A Site Location Plan is included as Figure 1.

1.2 Context & Purpose

The aim of the investigation is to complete a geo-environmental assessment of the proposed development area. The investigation will obtain information regarding ground conditions, from which risks to end-users, the environment and structures can be assessed, with mitigation measures outlined, if necessary.

The investigation will provide geotechnical information in order to comment on the preliminary design of foundations and infrastructure. The report will provide recommendations for further work based on the findings of the investigation, if required.

It is understood that the Site is proposed to be redevelopment for mixed residential and commercial use (Figure 2). Planning Permission for the development has been granted subject to conditions (Haringey Council Ref: HGY/2017/2044), specifically Condition 29 relating to Land Contamination. This report is considered to address the requirements of Part A requiring a risk assessment, conceptual site model and outline remediation requirements. A further detailed report to address the requirements of Part B relating to remediation and monitoring is not considered to be required.

1.3 Scope of Works

The scope of the investigation and layout of this report has been designed with consideration of *CLR11* (Environment Agency, 2004a) and *BS 10175: 2013 Investigation of Potentially Contaminated Sites – Code of Practice* (BSI, 2011) and guidance on land contamination reports issued by the Environment Agency (EA) (2010a).

The project was carried out to an agreed brief as set out in Delta-Simons' proposal dated 20th February 2018 (ref.18-0192.01 V2). The scope of works is outlined in Section 3.2.1.

1.4 Existing Information

The following information has been made available to Delta-Simons for review:

- ▲ Ashley Road, Tottenham Hale, Geotechnical and Geoenvironmental Interpretive Report, Card Geotechnics Ltd (GCL), February 2017;
- ▲ Preliminary Risk Assessment – Land Quality by, WSP dated April 2017; and
- ▲ Ashley Gardens and Berol Yard Environmental Statement, by WSP dated June 2017.

1.5 Limitations

The assessment is limited to the issues agreed within the proposal for the works. Notes on limitations associated with this assessment are provided in Appendix A.

Specific limitations associated with the site investigation works are discussed in Section 3.

2.0 Site Details

2.1 Site Setting

A summary of the current Site status, environmental setting and key historical features is presented below. This includes data summarised from the existing report(s) listed in Section 1.4 which should be consulted for further detail.

Co-ordinates	Centred approximately at National Grid Reference 534436, 189687.	Elevation	8.5 m AOD
		Area	0.85 Ha
Site Location	The Site is located off Ashley Road, approximately 9 km north of the City of London. A Site location map is provided as Figure 1.		
Current Site Use	The Site forms a roughly rectangular parcel of land, bound to the north and south by a brick and concrete walls, to the west by a Berol House and to the east by metal fencing. The Site is currently occupied by Berol House and four other buildings which are currently being demolished with associated parking and access. The areas of parking and access comprise concrete and asphalt hardstanding. The Site was formerly of commercial use.		
Historic Site Use	Historical maps indicate the Site comprised open fields until a development of a pencil factory recorded in 1913 with several phases of expansion until 1956. From 1961 mapping the on-Site buildings are labelled as 'Factory'. The Site layout remained unchanged until 1999 satellite imagery. Historical mapping shows various works in the surrounding area with an electrical substation present immediately north of the Site		
Proposed Development	The proposed redevelopment is for mixed residential and commercial use. Proposed development plans are presented in Figure 2. Identified human and built environment receptors (R) relevant to the proposed development comprise: ▲ R1 - Construction workers. ▲ R2 - Third parties during construction (adjacent Site users and adjacent residents). ▲ R3 - Future Site users and maintenance workers. ▲ R4 - The Built Environment (new buildings and infrastructure / utilities).		
Environmental Setting	From BGS 1:50 000 Geological Mapping, the Site is indicated as being underlain by superficial deposits of the Enfield Silt Member which in turn is underlain by the Kempton Park Gravel Member. The underlying bedrock comprises London Clay which in turn is underlain by the Lambeth Group comprising clay, silt and sand underlain by the Thanet Sands and White Chalk at depth. The EA classify the superficial deposits of the Enfield Silt Member as Unproductive Strata and the Kempton Park Gravel Member as a Secondary A Aquifer. The EA classify the bedrock at the Site of the London Clay as Unproductive Strata, the Lambeth Group is classified as a Secondary A Aquifer and the Chalk is understood to be classified as a Principal Aquifer.		

	BGS Borehole records within the wider area indicate the London Clay is up to 17 m in thickness, providing a relatively impermeable layer above the Secondary A and Principal Aquifers at depth. The nearest surface water feature is Pymmes Brook located approximately 290 m east of the Site and forms part of the waterways of Walthamstow Reservoir. The Walthamstow Reservoir located 600 m to the east is a Ramsar site, a Site of Special Scientific Interest and a Special Protection Area. The Site is within an area considered to be at low risk of flooding from rivers, sea and surface water, however the site is at risk of flooding from reservoirs. The Site lies within an area where less than 1% of homes are above the National Radiological Protection Board (NRPB) recommended "action level" for radon. BRE211 (2007) indicates that no radon protective measures are necessary in the construction of new buildings at the Site. The following controlled water / environmental receptors have been identified: ▲ R5 - The Pymmes Brook. ▲ R6 - The underlying aquifers.
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2.2 Previous Site Investigation

Key Findings	Ashley Road, Tottenham Hale, London – Geotechnical and Geoenvironmental Interpretative Report by CGL dated February 2017. It is understood that CGL undertook an intrusive investigation focussed on the south-eastern corner of the Site. CGL's intrusive investigation included five windowless sampling holes to a maximum depth of 4.0 m bgl and two cable percussion boreholes to a maximum depth of 35.0 m bgl. Asbestos was identified in one intrusive location within the Made Ground soils at the Site. Chemical testing identified concentrations of lead, cyanide and PAHs in exceedance of 'Residential without home-ground produce' GACs within the Made Ground soils at the Site. CGL recommends that where Made Ground is not removed for basement construction, a capping layer system would be required to break the pathway between contaminants and potential receptors. Chemical testing on groundwater identified no elevated concentrations of contaminants in exceedance of screening values. CGL noted that Made Ground soils around one intrusive location were considered hazardous for disposal due to elevated lead concentrations. The presence of asbestos fibres in the Made Ground at the Site requires waste to be disposed at a landfill licensed to accept asbestos containing materials. Ground gas Characteristic Situation 2 (CS2) was calculated for the Site. CGL noted that sub-artesian pressures were encountered at depth within the Lambeth Group sand and a significant water strike within the London Clay. This meant groundwater encounter is very likely during excavation for the proposed basement. It is recommended that both raft foundations and shallow foundations should be formed with the Kempton Park Gravel Member and an allowable pressure of 200kPa for shallow foundation installation within this strata. Pile foundations are understood to be the method used for the proposed development. A significant head of water was recorded in the Lambeth Group and will need to be considered during pile design as well as the possibility of encountering granular soils at
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	depth. Furthermore, the report stated that the proposed developments must take into account the extra stresses endured on the LUL tunnel. The Concrete Design Sulphate (DS) classes and Aggressive Chemical Environment for Concrete (ACEC) classes are DS-2 AC-2 within the Made Ground, class DS-1 and AC-1 within the Kempton Park Gravel Member and Lambeth Group and a maximum concrete DS class of DS-5 and ACEC class AC-5 within the London Clay.
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3.0 Site Investigation

3.1 Intrusive Investigation

Delta-Simons carried out intrusive investigation work from 5th to 9th March 2018 to assess the potential linkages identified in the outline conceptual model and to provide geotechnical information.

3.1.1 Health & Safety Considerations

Service plans for the site were provided by the client; and a utilities clearance specialist attended the site on 5th March 2018 to trace services on and around the site prior to excavation of exploratory hole locations.

An initial assessment of the Site identified a potential risk in relation to Unexploded Ordnance (UXO), therefore, the following precautionary measures which were applied for the works:

- ▲ Specialist staff induction.
- ▲ Full time site attendance from a UXO specialist.

Future contractors should undertake their own assessment of UXO risk in relation to their specific proposed scope of works.

3.1.2 Specific Limitations

Specific limitations during Site investigation works comprised the following:

- ▲ Intrusive locations limited to external areas due to ongoing demolition works.
- ▲ CP101 terminated at 21.86 m bgl on hard strata.
- ▲ CP102 terminated at 8.0 m bgl due to detection of ferrous anomaly recorded by the UXO specialist and terminated on their advice.

3.2 Scope of Ground Investigation and Rationale

3.2.1 Scope

The ground investigation comprised the following items:

- ▲ Supervision of all works by a Delta-Simons Geo-Environmental engineer. All intrusive locations were logged to BS5930:2015 Code of Practice for Site Investigations;
- ▲ Drilling of six window sampler holes (DS102 to DS106 and WS01) to a maximum depth of 6.0 m bgl; and
- ▲ Drilling of two Cable Percussive Boreholes (CP101 to CP102) to a maximum depth of 21.86 m bgl.

3.2.2 Rationale

Location	Rationale
DS102 to DS106 and WS05 (DS107)	General coverage of Site to characterise ground conditions, collect environmental samples and install monitoring wells to obtain water samples and ground gas data on return visits.
CP101 and CP102	General coverage of Site to characterise ground conditions, collect environmental samples, collect geotechnical information/ samples and targeting deeper aquifers to install monitoring wells to obtain water samples and ground gas data on return visits.

3.3 Ground Investigation Factual Data

The investigation locations were surveyed in by the appointed surveying contractor to an accuracy of approximately +/- 0.1m. An intrusive exploratory hole location plan is presented as Figure 3.

Delta-Simons engineer verified borehole logs are presented as Appendix B, the SPT Calibration Certificates, in accordance with *BS EN ISO 22476-3:2005 (incorporating corrigendum No. 1 2007), Geotechnical investigation and testing - Field testing - Part 3: Standard penetration test for SPT trip hammers* are provided in Appendix B.

3.4 In-Situ Testing and Sampling

SPT tests were undertaken in all boreholes at 1.00 m intervals until 5.00 m bgl, then every 1.5 m bgl thereafter. The results of these tests are presented in the borehole logs included as Appendix B.

Sampling comprised disturbed tub and jar samples as detailed on the borehole logs.

3.5 Geotechnical Laboratory Testing

A selection of soil samples were submitted to a UKAS accredited laboratory for a range of geotechnical testing, the results of which are included in Appendix C.

The programme of geotechnical testing undertaken on samples obtained from the natural soils is presented within the table below. The purpose of the laboratory testing was to assess the classification properties of the soils encountered in order to inform the outline geotechnical design advice.

Analysis	No. Tested	Rationale
Moisture content	6	To enable geotechnical assessment of cohesive soils
Plastic and liquid limits	6	To enable geotechnical assessment of cohesive soils
Particle size distribution	1	To enable geotechnical assessment of granular soils
Oedometer	3	To enable geotechnical assessment of cohesive and fine granular soils
Quick Undrained Triaxial Multistage	5	To enable geotechnical assessment of soils for foundation design

3.6 Environmental Sampling, In-Situ Testing and Laboratory Analysis

Soils collected for laboratory analysis were placed in a variety of containers appropriate to the anticipated testing suite. Samples were stored in accordance with Delta-Simons' quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination. Records of the samples taken as part of the site investigation works, including their depths and location, are included within the exploratory hole records in Appendix B.

Nine groundwater samples were collected on 22 March 2018. The groundwater samples were collected using a dedicated disposable bailer.

Samples analysed for environmental purposes were placed in chilled cool boxes on site and transported to the laboratory for analysis on completion of the site investigation works / groundwater sampling visit.

The rationale for chemical analysis is presented in the table below and the results of the chemical laboratory testing are included in Appendix D and E.

Analytes	No. of Samples Tested		Rationale
	Soil	Groundwater	
Asbestos	9	-	General suite of analysis to characterise the Made Ground and natural soils at the Site. Hydrocarbon, VOC/SVOC and BTEX analysis scheduling based on field observations, PID results and potential sources of historic contamination based on historical mapping. PCBs scheduled in associated with current on-Site transformer. Water and acid soluble sulphate to assess potential for chemical attack on buried concrete.
Metals	8	6	
Speciated Total Petroleum Hydrocarbons, Criteria Working Group Method (TPH-CWG)	4	6	
Total TPH (C6-C40)	7	3	
Polycyclic Aromatic Hydrocarbons (PAH 16)	6	2	
BTEX	4	2	
Volatile Organic Compounds (VOC)	3	4	
Semi-Volatile Organic Compounds (SVOC)	3	4	
Polychlorinated Biphenyls	2	1	
Phenols	3	6	
Water and Acid Soluble Sulphate	6	-	
Total Sulphate	-	9	
Total Sulphur	6	-	
pH	6	9	
Total Organic Carbon (TOC)	3	-	

3.7 Monitoring Programme

Four rounds of groundwater level and ground gas monitoring were undertaken on all newly installed wells (DS102 – DS106, DS107 (WS05), CP102) and pre-existing wells (BH1 and BH2) between 22nd March and 12th April 2018. Measurements of the depth to groundwater within the monitoring wells were taken using an electronic dip meter. The groundwater level monitoring sheets are included as Appendix F.

To characterise the ground gas regime at the site, an infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume. Initial and steady state concentrations were recorded. The atmospheric pressure before and during monitoring, together with the weather conditions, was recorded. All monitoring results obtained to date together with the temporal conditions are contained within Appendix F.

4.0 Ground Summary

4.1 Introduction

The sections below summarise the ground and groundwater conditions encountered during the site investigation.

4.2 Ground Model

A summary of the observed ground conditions at the Site is provided below.

Summary of Observed Ground Conditions			
Strata	Typical Strata Description	Depth Range of Strata Base (m)	Maximum Proven Thickness (m)
Made Ground	Made Ground was encountered in all locations across the Site and found to be between 0.75 and 2.20 m in thickness. Asphalt and/ or concrete hard standing was cored/ broken out at all intrusive locations. Buried concrete was encountered and broken through at DS106 at a depth of 0.25 with a thickness of 0.15 m. The Made Ground recovered from the intrusive locations was found to be of five general descriptions. In two locations (CP101 and CP102) Made Ground comprised brown grey red sandy gravelly cobbles of brick. In one intrusive location (CP101) Made Ground comprised light brown gravelly clay with a low cobble content of concrete and brick. In six intrusive locations (DS102 to DS106 and WS05) Made Ground comprised grey and brown sandy locally clayey gravel of concrete, brick, clinker, flint and other mixed lithologies. Occasional brick cobbles and fragments of glass, plastic and pencil were noted. In two intrusive locations (DS103 and DS106) Made Ground comprised brown clayey sandy gravelly silt. In two intrusive location (DS102 and DS104) Made Ground comprised orange brown and brown clayey gravelly sand. DS104 included occasional brick cobbles and occasional fragments of glass and pencil.	0.75 - 2.20 m bgl	2.20 m
Enfield Silt Member	Enfield Silt Member was encountered in six intrusive locations across the Site and found to be between 0.40 – 2.10 m in thickness. The Enfield Silt Member recovered from the intrusive locations was found to be of three general descriptions. In six intrusive locations (DS102 to DS106 and WS05) the Enfield Silt Member comprised orange brown clayey gravelly sand. In one intrusive location (DS105) the Enfield Silt Member comprised orange brown and light brown sandy gravelly clay. In one intrusive locations (DS104) the Enfield Silt Member comprised orange brown clayey sandy gravel.	1.50 – 2.90 m bgl	2.10 m
Kempton Park Gravel Member	Kempton Park Gravel Member was encountered in all eight intrusive locations across the Site and found to be between 1.50 and 4.10 m in thickness. The Kempton Park Gravel Member recovered from the intrusive locations was found to be of two general descriptions. In seven intrusive locations (CP101, DS102 to DS106 and WS05) the Kempton Park Gravel Member comprised orange or yellow brown sandy gravel with a low cobble content.	3.00 – 6.30 m bgl	4.10 m

	In five intrusive locations (CP102 and DS102 to DS105) the Kempton Park Gravel Member comprised orange brown or yellow brown gravelly sand. The Kempton Park Gravel Member in CP102 is gravelly sand, becoming sand and gravel and then sandy gravelly cobbles.		
London Clay	London Clay was encountered in two intrusive locations across the Site and proven to a depth of 21 m bgl. The London Clay recovered from the intrusive locations was typically stiff grey slightly gravelly clay. The London Clay in CP102 contained a low cobble content.	8.00 – 21.00 m bgl	15.10 m
Lambeth Group (Assumed)	No recovery, assumed Lambeth Group.	21.86 m bgl	0.86 m

4.3 Groundwater

4.3.1 Strikes During Investigations

Groundwater strikes were recorded at three intrusive locations (CP101, CP102 and DS106) as drilling progressed, ranging from 2.5 to 3.2m bgl (5.52 to 6.12m AOD).

4.3.2 Levels During Monitoring Programme

Groundwater levels were monitored on a total of four occasions between 22nd March and 12th April 2018. Monitoring data measurements are provided in Appendix F and summarised in the table below.

Exploratory Hole	Response Zone		Water level during monitoring Max/Min Range		LNAPL Y/N	Stratum
	m bgl	m AOD.	m bgl	m AOD.		
DS102	1.00 - 4.00	7.64 – 4.64	1.74 – 1.99	6.65 – 6.90	No	MG, ES, KPG
DS103	1.00 - 3.00	7.66 – 5.66	1.77 – 2.01	6.65 – 6.89	No	ES, KPG
DS104	2.00 - 4.00	7.14 – 5.14	2.18 – 2.45	6.69 – 6.96	No	ES, KPG
DS105	1.00 - 2.60	7.87 – 6.27	1.92 – 2.15	6.72 – 6.95	No	MG, ES, KPG
DS106	1.00 - 4.00	7.62 – 4.32	1.72 – 1.99	6.63 – 6.90	No	ES, KPG
WS05 (DS107)	2.00 - 4.00	6.60 – 4.60	1.86 – 2.14	6.46 – 6.74	No	ES, KPG
CP102	8.00 - 18.00	0.72 – -9.28	1.89 – 2.26	6.46 – 6.83	No	LC
BH1	2.00 - 6.00	6.60 – 2.60	1.80 – 19.69	-11.09 – 6.80	No	KPG, LC
BH1 (D)	27.50 - 35.00	-18.90 – -26.40	5.71 – 18.85	-10.25 – 2.89	No	LB
BH2	10.00 -12.50	-1.40 – 3.90	5.70 – 5.83	2.93 – 2.77	No	LC

MG = Made Ground ES = Enfield Silt Member KPG = Kempton Park Gravel Member LC = London Clay LB = Lambeth Group

4.4 Material Properties

The table below summarises the factual material properties based upon the results of in-situ and laboratory test data and where appropriate provides derived geotechnical parameters. An SPT Plot is included as Figure 4.

Parameter	Made Ground	Enfield Silt Member	Kempton Park Gravel Member	London Clay
Moisture Content - w	-	11%	-	25%-43%
Liquid Limit - wL	-	-	-	49% - 82%
Plastic Limit - wP	-	-	-	24% - 32%
Plasticity Index - IP	-	-	-	25% - 53%
Bulk Unit Weight - γ	-	19.03 kN/m ³	-	18.54-20.01 kN/m ³
Uncorrected SPT N Value	12 - 16	12	19-32	12-30
Corrected ¹ SPT (N ₆₀)	12.6-16.8	12.2	19.95-32.53	12.6-30.5
Undrained Shear Strength ^{2,3} - cu	-	-	-	120-228 kPa
1. SPT N values corrected for energy delivered to drive rods utilising the determined energy ratio (E_r): $N_{60} = (E_r \times N) / 60$ after BS EN ISO 22476-3:2005 [Ref. 5] 2. From laboratory test results 3. Correlation by Stroud				

4.5 Geochemical Testing

Geochemical analysis was undertaken on soil samples from the Enfield Silt Member, Kempton Park Gravel Member and London Clay, and groundwater samples tested for selective determinants (BRE Special Digest 1:2005 (3rd Edition), Concrete in Aggressive Ground, the results of which are summarised in the table below.

Tests	No. of Tests	Minimum	Maximum
Soil - pH	10	6.5	8.8
Soil - Total Sulphur	10	0.006%	1.41%
Soil – Acid Soluble Sulphate	10	0.018%	4.23%
Soil - Water Soluble Sulphate	10	14 mg/L	900 mg/L
Water – pH	9	7.5	11.7
Water - Sulphate	9	49.3 mg/L	162 mg/L

4.6 Ground Gas Data

Gas monitoring results are presented in Appendix F and are summarised in the table below, a total of four rounds of gas monitoring was undertaken over a period of four weeks.

Barometric pressures ranged from 991 mB to 1017 mB.

Exploratory Hole	Steady Gas Concentration (%v/v)						Steady Flow Rate (l/hr)		Response Zone (m bgl)		Stratum	Flooded?
	Methane		Carbon Dioxide		Oxygen							
	Min	Max	Min	Max	Min	Max	Min	Max	From	To		
DS102	<0.1	3.0	<0.1	<0.1	16.6	21.7	<0.1	1.5	1.00	4.00	MG, ESM, KP	N
DS103	<0.1	0.2	<0.1	0.1	19.9	21.8	<0.1	0.1	1.00	3.00	ESM, KP	N
DS104	<0.1	0.2	<0.1	1.7	6.2	20.5	<0.1	0.1	2.00	4.00	ESM, KP	N
DS105	<0.1	0.2	<0.1	0.4	18.4	20.1	<0.1	0.4	1.00	2.60	ESM, KP	N
DS106	<0.1	0.2	<0.1	0.5	17.6	20.3	<0.1	0.1	1.00	4.00	ESM, KP	N
WS05 (DS107)	<0.1	0.2	<0.1	0.8	20.0	20.5	<0.1	<0.1	2.00	4.00	KP	N
CP102	<0.1	0.2	<0.1	0.7	15.0	20.6	<0.1	4.6	8.00	18.00	LC	Y
BH1	<0.1	0.2	<0.1	0.4	20.3	21.1	<0.1	0.1	2.00	6.00	KP, LC	Y
BH1 (D)	<0.1	0.3	<0.1	0.3	20.0	21.9	<0.1	1.5	27.50	35.00	LG	Y
BH2	<0.1	0.2	<0.1	0.4	19.3	21.7	<0.1	<0.1	10.00	12.50	LC	Y
MG = Made Ground, ESM = Enfield Silt Member, KP = Kempton Park Gravel Member, LC = London Clay, LG = Lambeth Group												

4.7 Visual and Olfactory Evidence of Contamination

No visual or olfactory evidence of potential gross contamination was observed during the investigation.

5.0 Geotechnical Assessment

5.1 Summary of Development Proposals

The proposed redevelopment of the Site comprises the construction of two buildings one of which will comprise a college building and a residential building with commercial ground floor space and the retention of Berol House.

At the time of writing, structural and floor loadings and final levels were unknown. Consequently, the information provided below should be treated as preliminary and will be subject to review once a scheme and levels have been finalised.

5.2 Foundations

5.2.1 Spread Foundations

The Made Ground is considered to be too unpredictable, variable, weak and compressible in its existing condition for conventional shallow foundations at the Site.

For preliminary design purposes, assuming that groundwater would be adequately controlled, trench fill foundations may be suitable founded within the Kempton Park Gravels and are likely to achieve an allowable bearing capacity of 250kPa (limited to less than 25 mm settlement).

In the areas in the east of the Site where deep Made Ground and Enfield Silt Member have been encountered (2.9m deep in CP102), localised over excavation / trench fill may be required.

All foundation excavations should be inspected by a suitably qualified geotechnical engineer prior to casting to ensure the appropriate depth, founding medium and strength characteristics have been achieved.

5.2.2 Volume Change Potential

The volume change potential should be considered in any foundation schedule for structures and services located within the influence zone of trees or bushes (proposed, existing or to be removed) and appropriate precautions and/or founding depths should be designed accordingly. In cohesive soils, foundations will therefore need to be designed in accordance with NHBC Standard Chapter 4.2 '*Building Near Trees*' (2016).

The A-Line Plot suggests that the London Clay is of intermediate to very high plasticity. The liquid limit and plasticity index results suggest that the London Clay has a potential swell classification of medium to high and volume change is likely.

5.2.3 Ground Improvement Techniques

At this stage, ground improvement techniques for foundation construction are considered unsuitable on the Made Ground and Enfield Silt Member, given the expected large design loads.

5.2.4 Piling

Due to the high expected design loads, it is likely that a piled foundation solution using continuous flight auger (CFA) piles transferring loads to competent geology is more suitable, utilising both skin friction and end bearing capacity.

The precise method of pile installation and applicability of proprietary systems, diameters and depths required and risk assessment in conjunction with TFL for LUL would need to be informed based on the results of this investigation, by discussions with a suitably qualified piling contractor.

CP102 terminated at 21.86 m bgl within the Lambeth Group, however CGL's intrusive investigation included two cable percussion boreholes to a maximum depth of 35.0 m bgl terminating within the Lambeth Group. It is understood that the piling contractor will be relying on this combined data to inform their pile design.

Individual pile/pile group loads will be a function of the surface area of the piles to be employed at the Site and their method of construction.

It is recommended that during demolition of the building, all relict basements, foundations, piles caps and other obstructions are removed and the locations of existing piles (if present) recorded to avoid in-ground obstructions during piling.

Normal static and dynamic load testing (including uplift tests) should be considered to achieve satisfactory quality control/assurance in accordance with good practice.

There will be a requirement for the placement of a suitably engineered piling mat, which should be designed and validated by a suitably qualified and experienced engineer.

5.2.5 Floor Slabs

It is considered that the significant thickness of Made Ground soils are too variable and compressible in their existing state for ground bearing floor slabs.

It is recommended that floor loads should be transferred to the piles through concrete ground beams/concrete frame.

5.3 Roads and Pavements

It is recommended that a conservative CBR value of 2% should be adopted for the shallow soils, for preliminary pavement design for external areas. It is recommended that plate CBR tests are undertaken at formation level after demolition prior to finalising pavement design.

5.4 Drainage and Soakage Tests

The Made Ground is not considered suitable for soakaway design; surface water drainage should not be designed to soak through the Made Ground.

5.5 Excavations & Obstructions

It is expected that conventional mechanical excavators will readily remove the Made Ground, Enfield Silt and Kempton Park Gravels likely to be encountered in shallow excavations although a breaker may be required to remove any existing concrete hardstanding.

All shallow foundation or services excavations at the Site should be considered unstable, therefore, temporary support of all excavations should be considered when excavating on-Site.

5.6 Groundwater

Resting groundwater levels recorded during the return monitoring visits were between 1.74 m and 18.85 m bgl, within the Kempton Park Gravels and the London Clay.

Groundwater is likely to be encountered in shallow excavations and trenches which penetrate the Kempton Park Gravels and may require appropriate groundwater control.

5.7 Chemical Attack on Buried Concrete

In accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' 2005, the Made Ground and superficial deposits (when considered together), would be classified as Design Sulphate Class DS-2 and ACEC Class AC2 for soils and groundwater for concrete design when assuming mobile groundwater. The London Clay would be classified as Design Sulphate Class DS-5 and ACEC Class AC-4s for soils and groundwater, when considering the most appropriate type of concrete to be used at the site in order to resist chemical attack from elevated sulphate present in the soils (assuming static groundwater in potentially pyritic soils).

Piling is not generally considered to result in disturbed ground (BRE SD1 – Appendix A), therefore, any pyrite is unlikely to be oxidised. As such, consideration can be given to water soluble sulphate content of the clay (BRE SD1 – Box C8), which in this case would result in a DS-2 classification based on the results contained.

6.0 Generic Quantitative Risk Assessment

6.1 Introduction

The presence of hazardous substances in or on a site is generally only of concern if an actual or potential unacceptable risk exists. Legislation and guidance on the assessment of contaminated sites, consistent with UK best practice, acknowledges the need for a tiered risk based approach. A Preliminary Risk Assessment is presented in Section 2.2. This section represents a Generic Quantitative Risk Assessment (GQRA) being a comparison of site contaminant levels against Generic Assessment Criteria.

6.2 Human Health GQRA

The assessment of risks in relation to human health has been undertaken using Generic Assessment Criteria as detailed within the appropriate tables. Risks from soil, groundwater and Non-Aqueous Phase Liquids (NAPL) have been considered.

The end use scenario adopted for the assessment is a *Residential (without home grown produce) and Commercial* end use, considered appropriate based on the proposed residential development.

6.2.1 Risks from Soil Sources

Based on the proposed use of the Site for residential without gardens and commercial end use, the soil and groundwater chemical data has been compared against a commercial / industrial end use GAC for 1% soil organic matter (SOM) content.

The laboratory results for contaminants exceeding detection limit compared to their respective GAC are presented in the table below.

The primary exposure pathways considered in the risk assessment are as follows:

Direct

- ▲ Ingestion of soil and indoor dust and / or oral background exposure.
- ▲ Consumption of home-grown produce and attached soil.
- ▲ Inhalation of dust (outdoor and indoor).
- ▲ Direct dermal contact.

Indirect

- ▲ Inhalation of vapour (outdoor and indoor).

Contaminant	No. Samples	Max Conc. (mg/kg)	Residential GAC (mg/kg)	Commercial GAC (mg/kg)	GAC Source	No. Exceed GAC	Volatile	Location of Exceedances (depth) = Conc. (mg/kg)	Area of Site of Exceedance
Asbestos	9	Detected	Detected	Detected	DS	4	N	CP101 (0.35 m bgl) – Chrysotile loose fibres (<0.001%) CP102 (0.75 m bgl) – Chrysotile loose fibres (<0.001%) DS105 (0.30 m bgl) – Chrysotile and Crocidolite loose fibres (0.001%) DS104 (0.60 m bgl) – Chrysotile loose fibrous debris (0.028%)	Centre of Site
Metals and metalloids									
Arsenic	7	29	40	640	LQM/C4SL	0	N	All results below GACs	
Boron	7	2.6	11000	240000	LQM	0	N		
Cadmium	7	2	85	190	LQM	0	N		
Chromium III	7	59	910	8600	LQM	0	N		
Chromium IV	7	<LOD	6	33	LQM	0	N		
Copper	7	320	7100	68000	LQM	0	N		
Lead	7	430	310	2300	C4SL	1	N	DS104 (0.60 m bgl) = 430	East of Site
Mercury	7	8.5	56	73	LQM	0	Y	All results below GACs	
Nickel	7	69	180	980	LQM	0	N		
Selenium	7	<LOD	430	12000	LQM	0	N		
Zinc	7	480	40000	730000	LQM	0	N		
Polyaromatic Hydrocarbons									
Naphthalene	9	0.65	2.3	190	LQM	0	Y	All results below GACs	
Acenaphthylene	9	0.46	2900	83000	LQM	0	Y		
Acenaphthene	9	0.62	3000	84000	LQM	0	Y		
Fluorene	9	0.57	2800	63000	LQM	0	Y		

Contaminant	No. Samples	Max Conc. (mg/kg)	Residential GAC (mg/kg)	Commercial GAC (mg/kg)	GAC Source	No. Exceed GAC	Volatile	Location of Exceedances (depth) = Conc. (mg/kg)	Area of Site of Exceedance
Phenanthrene	9	5.7	1300	22000	LQM	0	N		
Anthracene	9	1.5	31000	520000	LQM	0	N		
Fluoranthene	9	11	1500	23000	LQM	0	N		
Pyrene	9	9.3	3700	54000	LQM	0	N		
Benzo[a]anthracene	9	5.9	11	170	LQM	0	N		
Chrysene	9	4.8	30	350	LQM	0	N		
Benzo[b]fluoranthene	9	9.1	3.9	44	LQM	1	N	CP102 (0.75 m bgl) = 9.1	North-east of Site
Benzo[k]fluoranthene	9	1.9	110	1200	LQM	0	N	All results below GACs	
Benzo[a]pyrene	9	6	3.2	35	LQM	1	N	CP102 (0.75 m bgl) = 6	North-east of Site
Indeno(1,2,3-c,d)Pyrene	9	2.8	45	500	LQM	0	N	All results below GACs	
Dibenz(a,h)Anthracene	9	0.93	0.31	3.5	LQM	1	N	CP102 (0.75 m bgl) = 0.93	North-east of Site
Benzo[g,h,i]perylene	9	3.7	360	3900	LQM	0	N	All results below GACs	
Petroleum Hydrocarbons									
Benzene	3	<LOD	0.38	27	LQM	0	Y	All results below LOD	
Toluene	11	<LOD	880	56000	LQM	0	Y		
Ethylbenzene	11	<LOD	83	5700	LQM	0	Y		
o-Xylene	11	<LOD	88	6600	LQM	0	Y		
m/p-Xylene	11	<LOD	79	59000	LQM	0	Y		
Aliphatic TPH >C12-C16	4	2.7	1100	59000	LQM	0	N	All results below GACs	
Aliphatic TPH >C16-C21	4	31	65000	1600000	LQM	0	N		
Aliphatic TPH >C21-C35	4	280	65000	1600000	LQM	0	N		

Contaminant	No. Samples	Max Conc. (mg/kg)	Residential GAC (mg/kg)	Commercial GAC (mg/kg)	GAC Source	No. Exceed GAC	Volatile	Location of Exceedances (depth) = Conc. (mg/kg)	Area of Site of Exceedance
Aromatic TPH >C16-C21	4	12	1900	28000	LQM	0	N		
Aromatic TPH >C21-C35	4	100	1900	28000	LQM	0	N		
Total Petroleum Hydrocarbons	4	311	5000	5000	DS	0	N		
Semi Volatile Organic Compounds (SVOCs)									
2-Methylnaphthalene	3	0.6	No GAC	No GAC	No GAC	N/A	N	All results below GACs	
Dibenzofuran	3	0.4	No GAC	No GAC	No GAC	N/A	N		

LOD = Limit of detection
GAC = Generic Assessment Criteria

6.2.2 Soil Results Summary

Widespread contamination of the soils has not been identified at the Site.

Asbestos, in the form of Chrysotile and Crocidolite (loose fibres) was identified in four intrusive locations in the east and north-east of the Site.

Slightly elevated concentrations of PAHs have been identified at one intrusive location in the north-east of the Site. Identified PAHs are not considered volatile.

Marginally elevated concentrations of SVOCs have been identified at one intrusive location in the east of the Site. Identified SVOCs are not considered volatile.

The soil analysis results are considered further in the Conceptual Site Model (CSM) presented in Section 8 with regard to potential pollutant linkages.

6.2.3 Risks from Groundwater Sources

Based on the proposed use of the Site for mixed residential and commercial use, the groundwater chemical data has been compared against a commercial / industrial end use GAC to assess risks from groundwater sources to indoor air and subsequent vapour inhalation indoors.

None of the site-specific contaminants of concern were recorded at concentrations in excess of their detection limits.

The water analysis results are considered further in the Conceptual Site Model (CSM) presented in Section 8 with regard to potential pollutant linkages.

6.2.4 Risks from Non-Aqueous Phase Liquids (NAPL)

Soil and groundwater exposure models used in generating Generic Assessment Criteria do not account for the potential for NAPL to represent a source of risk to human health, principally due to the production of vapours. Whilst it is possible to calculate theoretical soil saturation limits, in reality, due to co-solubility effects, these are not an appropriate indicator of the presence of NAPL. In order to assess the presence of NAPL, for petroleum hydrocarbons, an assessment criteria of 5000 mg/kg has been applied based on professional experience.

The following has been identified in relation to NAPL at the Site:

- ▲ No observations of NAPL were made within the soils observed during drilling;
- ▲ No concentrations of Total Petroleum Hydrocarbons in excess of 5000 mg/kg were recorded; and
- ▲ No NAPL was measured during groundwater monitoring works.

On this basis, there is no evidence of NAPL being present on the Site.

6.3 Controlled Waters / Water Environment GQRA

6.3.1 Groundwater Results

The approach adopted to assessing risks to Controlled Waters / Water Environment is based principally on considering the concentrations of contaminants identified within the groundwater samples obtained in comparison to relevant GAC.

Given the 'prevent and limit' approach of the Water Framework Directive (2000/60/EC) and the identified receptors, a range of Water Quality Standards (WQS) have been applied as Generic Assessment Criteria (GAC), these include the Freshwater Environmental Quality Standards (FEQS), the UK Drinking Water Quality Standards (DWQS), WHO Guidelines for Drinking Water Quality or Surface Waters Regulations which have been used as initial conservative GAC to assess whether groundwater contamination requires further assessment or discussion in terms of the risks to controlled waters.

Groundwater contaminant concentrations that exceed the applied GAC are then considered in the context of the Site's environmental setting as to whether further qualitative or quantitative assessment is required as described in subsequent sections. Laboratory results above relevant detection limits are summarised in the table below with a comparison to the GAC applied.

Contaminant	No. Samples	Max Conc. (µg/l)	GAC (µg/l)	GAC Source	No. Exceed GAC	Location of Exceedances = Conc. (µg/l)	Area of Site of Exceedance
Metals and Metalloids							
Arsenic	6	6.26	50	WFD	0	All results below GACs	
Boron	6	130	2000	WFD	0		
Cadmium	6	0.13	0.08	WFD	1	DS105 = 0.13	North-east of Site
Chromium III	6	14	4.7	WFD	0	All results below GACs	
Chromium VI	6	21	3.4	WFD	0		
Copper	6	50	2.12	WFD	0		
Lead	6	1.1	2.54	WFD	0		
Mercury	6	<0.05	0.75	WFD	0		
Nickel	6	16	8.48	WFD	2	DS105 = 16 DS106 = 15	North of Site
Selenium	6	8.4	7.5	WFD	1	DS103 = 8.4	West of Site
Zinc	6	5.7	23.1	WFD	0	All results below GACs	
Petroleum Hydrocarbons							
All results below LOD							
Polyaromatic Hydrocarbons							
All results below LOD							
Monoaromatics							

Contaminant	No. Samples	Max Conc. (µg/l)	GAC (µg/l)	GAC Source	No. Exceed GAC	Location of Exceedances = Conc. (µg/l)	Area of Site of Exceedance
All results below LOD							
Phenols							
All results below LOD							
VOCs and SVOCs							
All results below LOD							
PCBs							
All results below LOD							

LOD = Limit of detection
 GAC = Generic Assessment Criteria

6.3.2 Groundwater Results Summary

Marginal exceedances of cadmium, nickel and lead were detected in exceedance of the respective stringent GACs in the shallow groundwater at the Site. According to online BGS data, cadmium, nickel and lead are all naturally elevated in the region of the Site, therefore are not considered a potential risk to groundwater or surface water features.

The groundwater analysis results are considered further in the CSM presented in Section 8 with regard to potential pollutant linkages.

6.4 Built Environment

6.4.1 Potable Water Supply Pipes

The investigation requirements for the selection of potable water pipe material are set out in UKWIR Report 10/WM/03/21. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (UKWIR, 2010). This report has very specific and onerous investigation requirements and as such the detailed investigation of each utility route was not within the scope of this investigation.

A preliminary review of the results indicates that a relevant linkage is unlikely to exist associated with organic contaminants and therefore pollutant polyethylene (PE) and/or polyvinyl chloride (PVC) water supply pipes may be suitable for use on the development, however, until this is confirmed with the statutory undertaker then it should be assumed that barrier pipes may be needed for budgeting purposes.

It should be noted that at the time of this investigation the future routes of water supply pipes had not been established, hence the investigation and sampling strategy is not likely to be considered fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling/analytical strategy may be required at a later date once the route(s) of the supply pipe(s) are known. In addition, it is recommended that the relevant water supply company be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

6.4.2 Building Materials

Risks to building materials associated with aggressive ground conditions is addressed in Section 5.

6.5 Waste Classification

This investigation was not undertaken to classify materials in terms of waste disposal. Where waste disposal then a specific and detailed investigation in accordance with Environment Agency Guidance WM3 would typically be required.

Should soils be required to be disposed of from Site, the results of the chemical analysis should be forwarded to the proposed receiving facility who will determine what criteria they will accept the waste from Site. Further investigation in addition to specific waste acceptance criteria (WAC) analysis may be required.

Considering the nature of the materials encountered, more cost efficient and sustainable methods of removing the material should be considered prior to disposal at landfill (e.g. registering with the CL:AIRE Register of Materials) in an attempt to find a site with a requirement for import of materials.

7.0 Bulk Ground Gas Risk Assessment

7.1 Ground Gas Conceptual Site Model

7.1.1 Sources

Historically the site has been subjected to a number of commercial / industrial land uses, including phases of demolition. This has led to thicknesses of Made Ground across some parts of the site, proven to a maximum thickness of 2.2 m locally.

The Made Ground generally comprises sandy gravel, sandy gravelly cobbles, and gravelly clay mixtures. The gravel and cobble content included concrete, clinker, brick, flint, charcoal, sandstone and slag. Putrescible material appears to be absent, therefore, the Made Ground is not considered to be a significant potential source of ground gas. The underlying natural deposits are not considered a potential source.

Surrounding historical land uses, which includes former industrial facilities, may represent localised off-site sources of ground gases.

Information from the Groundsure report within the Ashley Road, Tottenham Hale, London report by CGL dated February 2017 indicates that no current or historic waste management facilities (landfills) have been identified within a 500m radius of the site.

7.1.2 Receptors

The principal receptors under consideration are future residents and site users. Other receptors include adjacent site occupiers and future maintenance / construction workers.

7.1.3 Pathways

The underlying geology is likely to be of variable permeability with respect to ground gases. The Made Ground is heterogeneous and likely to allow preferential migration locally. The underlying Enfield Silt is predominantly clay and likely to limit vertical migration from below and also lateral migration.

Based on the above, migration from off-site sources, including historical industrial land uses is considered unlikely due to the presence of the Enfield Silt Member.

The most significant pathways with respect to future residents relate to the potential for gases to enter future buildings. At present, no gas protection measures are assumed. Consequently, ingress into dwellings may be possible through voids in the floor including service entry points and cracks.

Future maintenance / construction workers may come into contact with hazardous ground gases via entry into below ground confined spaces such as excavations or service entries / inspection points.

7.2 Duration & Extent of Monitoring

Tables 5.5a and 5.5b within CIRIA C665 detail current recommended monitoring duration and frequency for sites in the UK. Based on the identification of potential sources in the preceding section, the gas generation potential is considered to be very low to low, whilst the sensitivity of the proposed development is low to moderate due to commercial uses on the ground floor and residential flats above. On this basis, CIRIA C665 recommends 4 to 6 visits over a minimum period of 1 to 3 months.

During the four monitoring visits, gas concentrations have been recorded in a total of nine monitoring positions. The locations of the monitoring wells are highlighted on Figure 3 and indicate representative coverage across the whole study area.

Barometric pressures during the gas monitoring period ranged from 991 mBar to 1017 mBar.

7.3 Ground Gas Risk Assessment

7.3.1 Background

Based on the proposed residential end use, the following documents have been consulted when assessing the gas regime at the site:

- ▲ NHBC/RSK Group PLC (2007), Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present, Report Edition No. 4.
- ▲ British Standards Institute (BSI, 2015): Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings, BS:8485.

The presence of a source of hazardous gas within the ground does not necessarily indicate a risk will be present. Consideration of recorded gas flows together with source concentrations can allow an initial assessment to be made of the potential both for generation and subsequent migration of gas. A Characteristic Situation (CS) is derived from an assessment of the ground gas data and forms the basis of determining mitigation measures.

7.3.2 Gas Screening Value (GSV)

The Gas Screening Value (gas concentration as a fraction x maximum recorded flow) is used to provide an initial assessment of risks to future site users. The GSVs calculated for the monitoring wells are presented in the following table.

Location	Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)	Maximum Flow Rate (l/hr)	GSV / Characteristic Situation			
				Methane		Carbon Dioxide	
				GSV	CS	GSV	CS
DS102	3.0	<0.1	4.2	0.126	2 (see text)	<0.07	1
DS103	0.2	0.1	0.1	<0.07	1	<0.07	1
DS104	0.3	1.8	2.4	<0.07	1	<0.07	1
DS105	0.2	0.4	0.6	<0.07	1	<0.07	1
DS106	0.2	0.6	0.3	<0.07	1	<0.07	1
WS05 (DS107)	0.2	0.8	0.0	<0.07	1	<0.07	1
CP102	0.2	0.7	4.6	<0.07	1	<0.07	1
BH1	0.2	0.4	0.3	<0.07	1	<0.07	1
BH1 (D)	0.5	0.2	1.5	<0.07	1	<0.07	1
BH2	0.2	0.4	<0.1	<0.07	1	<0.07	1

The preliminary data indicates that the Site can be provisionally classified as CS1 (very low hazard potential) in accordance with BS 8485:2015 Table 2. Though DS102 is calculated as CS2 based on peak values, it noted from a review of the data that elevated methane was only identified during the first monitoring visit with a peak of 3%, subsequent visits recorded methane concentrations of <0.1%, <0.1% and 0.2%.

Furthermore, flow rates at this location were generally below the detection limits (<0.1 l/hr), an initial positive peak flow of 4.2 l/hr on one occasion, though this rapidly dropped to a steady state of <0.1 l/hr. **It is, therefore, considered that a CS1 classification is appropriate for this location and the Site in general.**

7.4 Ground Gas Risk Mitigation

The ground gas regime at the site has been classified as a CS1 – very low risk. As such specific ground gas protection measures are not considered to be required based on this assessment.

The above assessment relates solely to future residential occupiers. Given the nature of the ground gas regime at the site, no further works are considered necessary to protect 3rd parties / surrounding occupiers. Entry to excavations / confined spaces should be restricted to personnel with relevant Confined Spaces training and with prior confirmation of atmospheric conditions.

7.5 Radon

The Site is located within an area where radon protective measures are not required.

7.6 Organic Vapours

No sources of potentially volatile vapours have been identified at the Site. Volatile vapour protection measures are not considered to be required in the proposed development.

8.0 Revised Conceptual Site Model

A revised CSM is presented in the table below and has been formulated taking into account all of the available data from the Delta-Simons intrusive investigation, suitable for a Site with a proposed mixed use residential and commercial end use.

Pollutant Linkage Assessment				
Source(s)	Pathway(s)	Receptor(s)	Confirmed Risk?	Mitigation
Potentially contaminated soils and/or groundwater located beneath the Site. Principally, Made Ground, including asbestos, lead and PAHs.	Direct contact/ ingestion and inhalation of dust and vapours.	Site users.	Yes	Though significant contamination has not been identified, elated concentrations of asbestos, lead and PAHs have been identified. Risks will be mitigated during the development through provision of hard cover over the majority of the Site will break the potential exposure pathways. Clean cover soils will be required in any landscaping areas.
	Direct contact, ingestion and inhalation of dust and vapours. Nuisance dusts and odours.	Neighbours during redevelopment earthworks.	Yes	The risks posed to construction workers and off-Site receptors during the redevelopment of the Site can be mitigated through best practice to minimise nuisance during earthworks. Good standards of personal hygiene should be observed and appropriate levels of personal protective equipment (PPE) provided and utilised to reduce the potential risks to groundworkers.
		Maintenance workers during any future sub-surface works at the Site.	Yes	
	Leaching of contaminants and vertical migration.	Groundwater beneath the Site and off-Site receptors.	No	A significant potential soil source or evidence of a potential groundwater contamination source has not been identified. The proposed development will reduce the potential risks through hardcover over the majority of the Site reducing infiltration.
Ground gas associated with Made Ground.	Vertical and lateral migration of ground gases.	Site users & buildings on-Site.	No	Ground gas monitoring during this assessment and previous third-party investigations has not identified significantly elevated concentrations or flow of ground gas. Based on this investigation the Site can be classified as CS1, though previous works have recommended a CS2 classification. Specific ground gas protection measures are not considered to be required based on this assessment. However, consideration may be given to the inclusion of basic ground gas protection measures as a precautionary measure.
Potentially contaminated soil and	Lateral migration and subsequent inhalation.	Groundwater beneath the Site	No	No evidence of contamination associated with the surrounding land uses and potential sources has been identified to date.

Pollutant Linkage Assessment				
Source(s)	Pathway(s)	Receptor(s)	Confirmed Risk?	Mitigation
groundwater from off-Site sources.		and future Site users.		Potential risks would be mitigated as a above with regards on-Site sources.
Localised 'hotspots' of contamination within areas not directly investigated	All pathways	All Receptors	Yes	Further details, development specific Site investigation will be required to fully characterise the Site. Uncertainty and risk will be reduced as a result of the development though the removal of landfill materials to achieve the reduced development platform levels.

9.0 Conclusions & Recommendations

9.1 Geotechnical Summary

The findings of the geotechnical assessment can be summarised as follows:

- ▲ For preliminary design purposes, assuming that groundwater would be adequately controlled, trench fill foundations founding on the Kempton Park gravels may achieve an allowable bearing capacity of 250 kPa (limited to less than 25 mm settlement);
- ▲ The depth and distribution of Made Ground will likely preclude the use of ground bearing floor slabs;
- ▲ Due to the expected high design loads, a piled foundation solution using continuous flight auger (CFA) piles transferring loads to competent geology may be suitable for the proposed development;
- ▲ The precise method of pile installation and applicability of proprietary systems, diameters and depths required and risk assessment in conjunction with TFL for LUL would need to be informed based on the results of this investigation, by discussions with a piling contractor;
- ▲ There will be a requirement for the placement of a suitably engineered piling mat, which should be designed and validated by a suitably experienced engineer;
- ▲ It is recommended that a conservative CBR value of 2% should be adopted for the shallow soils for preliminary pavement design and it is recommended that plate CBR tests are undertaken at formation level after demolition prior to finalising pavement design;
- ▲ Shallow groundwater is likely to be encountered in any excavations and trenches which penetrate the Kempton Park Gravels, as such excavations and trenches may require appropriate groundwater control;
- ▲ The conditions of the Made Ground and superficial deposits at the Site in accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' 2005, would be classified as Design Sulphate Class DS-2 and ACEC Class AC-2 for soils and groundwater. Piling is not generally considered to result in disturbed ground (BRE SD1 – Appendix A), therefore, any pyrite is unlikely to be oxidised. As such, consideration can be given to water soluble sulphate content of the London Clay (BRE SD1 – Box C8), which in this case would result in a DS-2 classification based on the results contained; and
- ▲ The depth and distribution of Made Ground across the site will likely preclude the use of traditional spread foundations and ground bearing floor slabs.

9.2 Contamination Issues

The investigation has been carried out in order to provide information on the quality of the soil and groundwater beneath the Site in the context of land contamination and provide information on the ground gas regime beneath the Site for a residential end use. The assessment is being completed prior to the proposed redevelopment of the Site.

9.2.1 Human Health

Widespread or significant contamination of the Site has not been identified, though asbestos and localised, low level lead and PAHs have been identified in the Made Ground. Based on the available information, specific remediation exercise to address risks to human health is not considered to be required.

Potential risks to human health will be mitigated though the development with the provision of hardcover over the majority of the completed development. Clean cover soils (minimum 300 mm) will be required in any landscaped areas.

Ground gas monitoring indicates the Site can be classified as CS1, therefore, specific ground gas protection measures are not considered to be required.

9.2.2 Controlled Waters

No widespread or significant contamination of groundwater, or a potential source within the soils was encountered during this investigation. Based on the available information, specific remediation methods to address risk to controlled waters are not considered to be required.

The underlying low permeability London Clay deposits will provide protection to the underlying aquifers at depth. It is understood that piled foundations will be completed using continuous flight auger (CFA) methods which will mitigate the potential risks associated with the creation of preferential pathways.

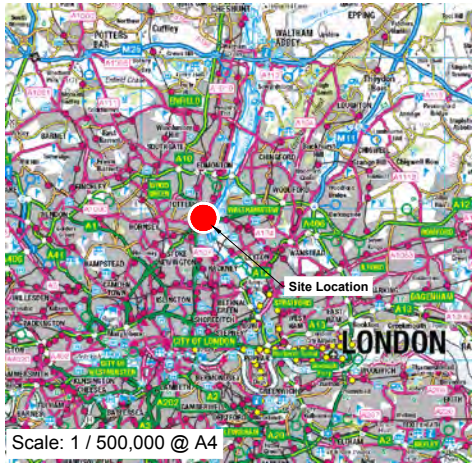
9.3 Recommendations for Supplementary Work

Based on the findings of this Assessment, further Site investigation, detailed risk assessment or specific remediation are not considered to be required. The following general recommendations for future development works are made:

- ▲ Future groundworks and piling contractors should make their own assessment of UXO risk in relation to their specific scope of works;
- ▲ Groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks and in particular the potential presence of asbestos and an appropriate protocol to mitigate exposure of the workforce and general public during development earthworks should be in place. The Contractor will need to prepare a risk assessment which identifies a safe system of work to handle the landfill materials which contain localised asbestos; and
- ▲ A protocol for unexpected finds as well as safe working procedures such as damping down of excavations and stockpiles in line with general dust generation mitigation. The risk assessment will need to identify the appropriate levels of PPE and/or RPE required. This recommendation should be captured in Site health and safety documentation and in maintenance plans.

Waste classification has not been undertaken as part of the scope of works, should it be proposed to dispose of materials from the Site then specific additional investigations may be needed to classify the materials in accordance with current regulatory requirements.

Figure 1 – Site Location Map



LEGEND

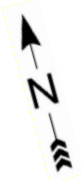
Site Boundary



Scale: 1 / 10,000 @ A4 Contains OS data © , Crown Copyright and Database Right (2016/2017)

	TITLE: Site Location Map Berol's Yard Tottenham			PROJECT NO: 18-0192.01	
	SCALE: To Scale@A4			FIGURE NO: 1	
	CHECKED BY: HW			REVISION: 1	
	DATE: 23 April 2018				

Figure 2 – Proposed Development Plan



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Proposed development Site Boundary



Figure 3 – Exploratory Hole Location Plan

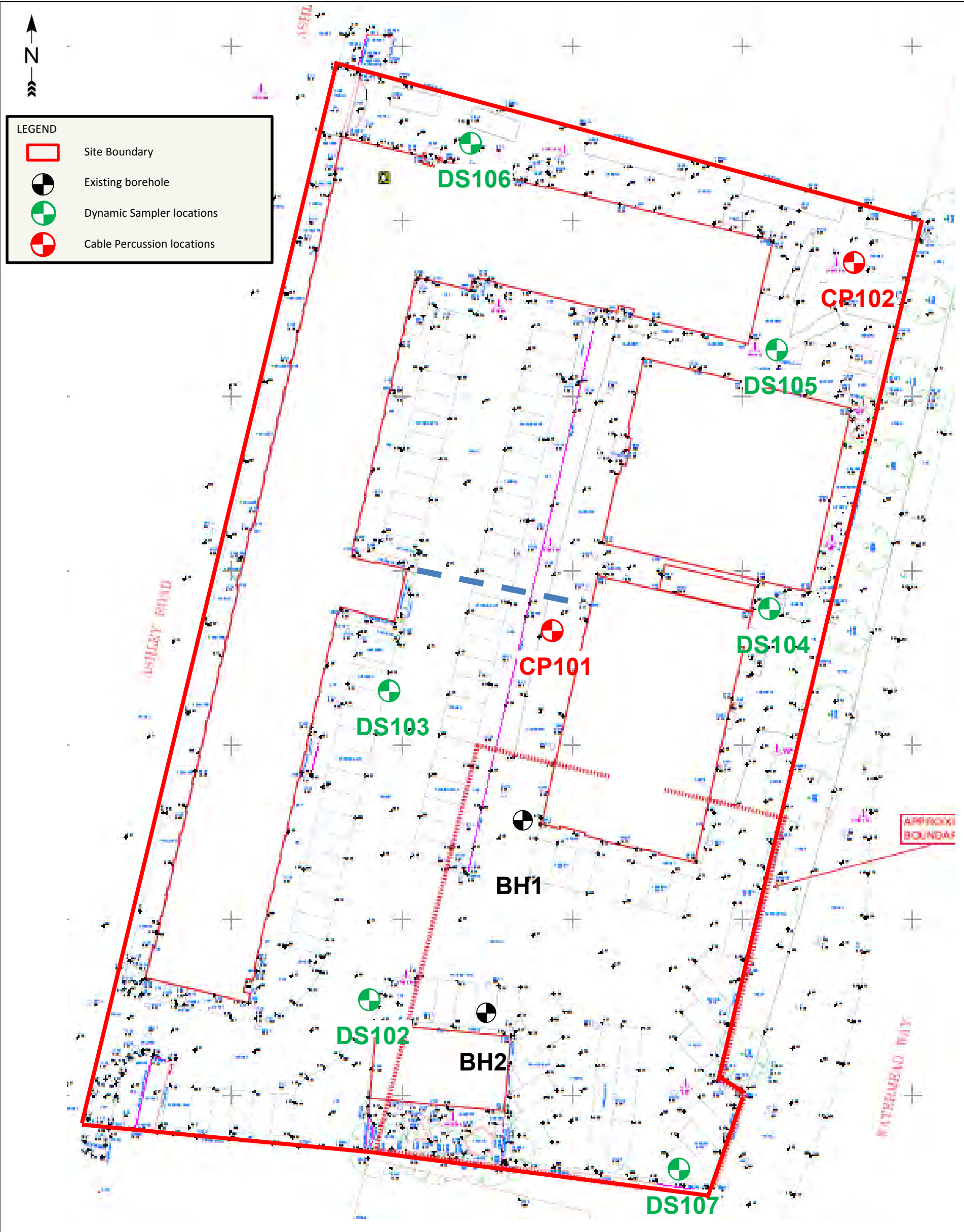
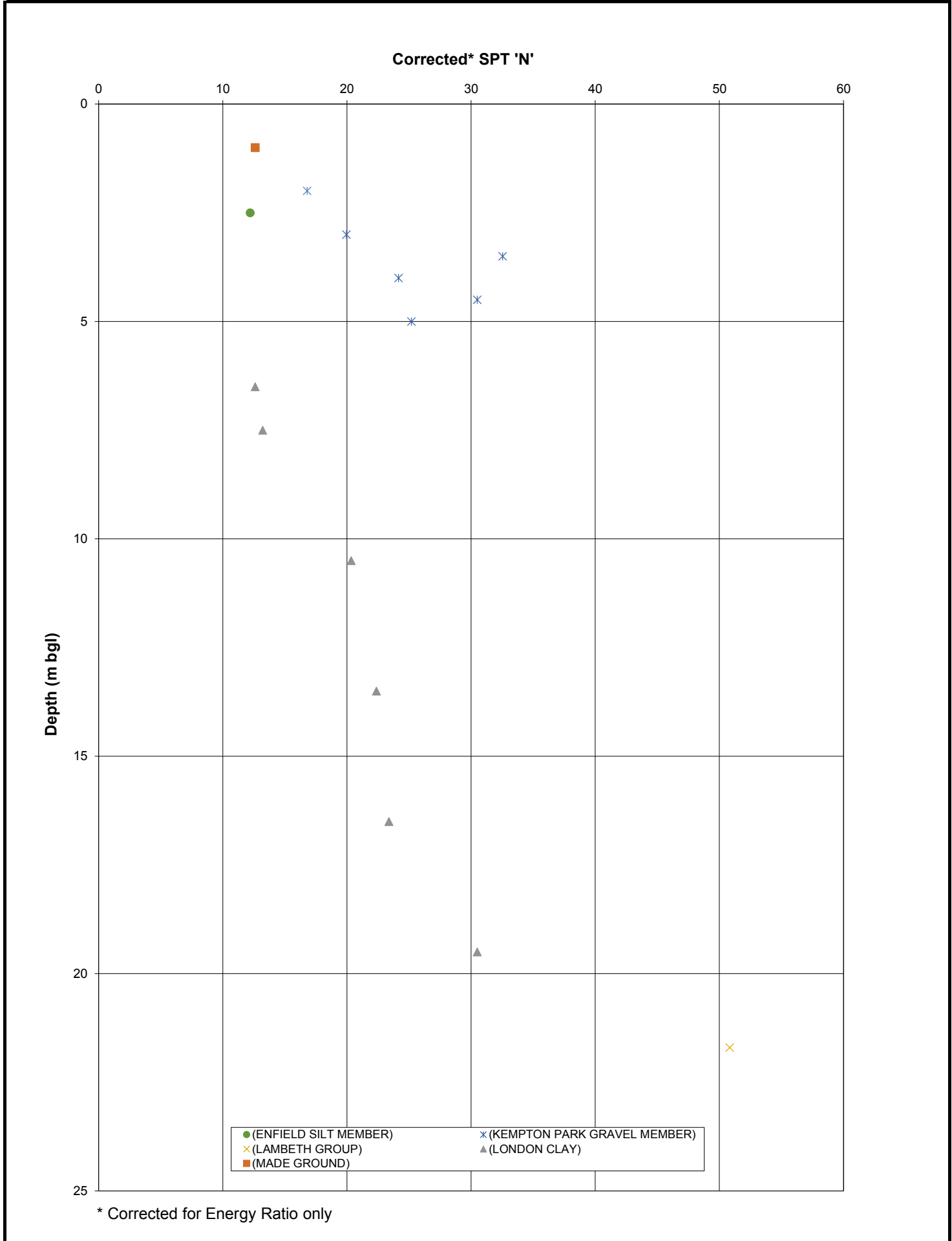


Figure 4 – Corrected SPT Results



Appendix A - Limitations

Limitations

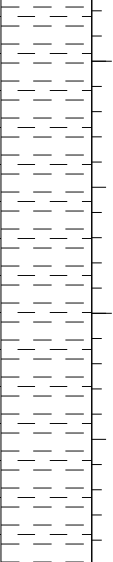
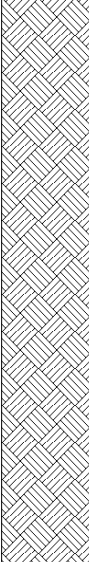
The recommendations contained in this Report represent Delta-Simons professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

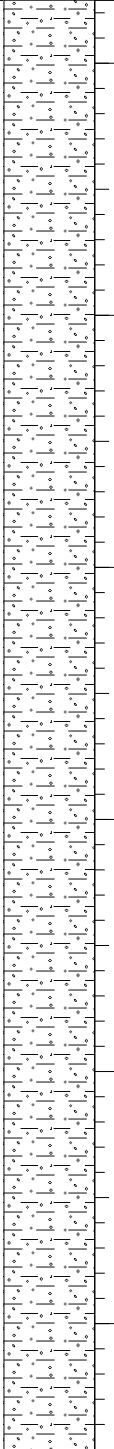
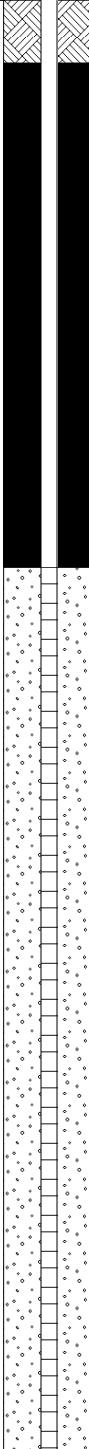
Delta-Simons obtained, reviewed and evaluated information in preparing this Report from the Client and others. Delta-Simons conclusions, opinions and recommendations has been determined using this information. Delta-Simons does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

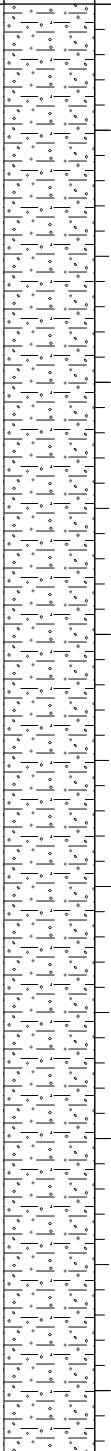
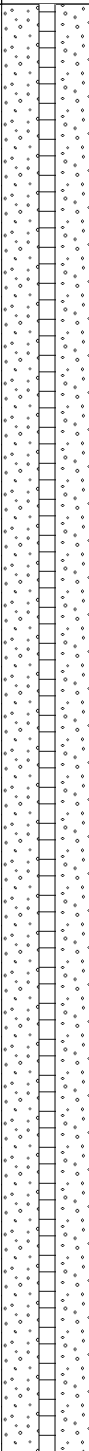
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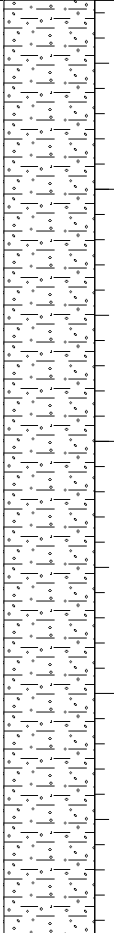
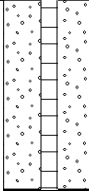
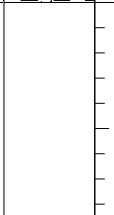
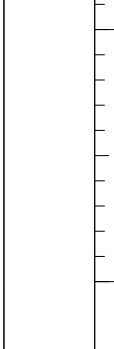
Appendix B – Borehole Logs & SPT Calibrations Certificate

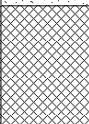
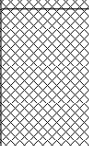
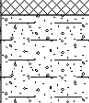
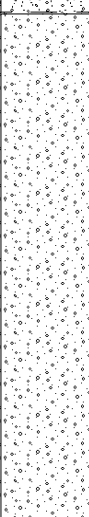
 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: CP101		Page: 1 of 2			
					Project: Berol's Yard, Ashley Road, Tottenham							
Cable Percussive Borehole Log					Date: 05/03/2018 - 06/03/2018			Client: Soil & Water Solutions Ltd				
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill
							Depth (m)	Type	Ref	Depth (m)	Results	
MADE GROUND: Asphalt. (MADE GROUND)		0.10	(0.10)	8.64								
MADE GROUND: Dark brown grey red sandy gravelly angular to subrounded COBBLES of brick. Gravel is angular to subrounded fine to coarse red brick, yellow brick and slag. Becomes clayey after 0.60 m bgl. Becomes very clayey after 0.80 m bgl. Cobbles become rare after 0.80 m bgl. (MADE GROUND)		0.80	(0.70)	7.94								
MADE GROUND: Light brown, slightly gravelly CLAY with a low cobble content. Cobbles are of concrete and brick. (MADE GROUND)												
Orange brown sandy GRAVEL with a low cobble content. Gravel is rounded to subrounded, fine to coarse flint. Cobbles are flint. (KEMPTON PARK GRAVEL MEMBER)		2.20	(1.40)	6.54								
		5.40	(3.20)	3.34								
Stiff grey CLAY. (LONDON CLAY)												
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. UXO magnetometer testing undertaken at regular intervals. 4. Borehole terminated at 8.00 m bgl due to UXO 'ferrous anomaly' detected. 5. Casing filled with water to control blowing sand. 6. Logged in general accordance with BS 5930:2015. 7. Borehole backfilled with arisings and reinstated with concrete. 8. SPT trip hammer reference BH04 Er=63%.					Water Stike			Water Level		Chiselling		
					Date	Time	Strike	Duration	Standing	Depth (m)	Time (h:m)	
					05/03/2018		3.00 m	20 min	2.50 m			
Coordinates: E534438.18 N189693.56		Elevation (mAOD): 8.74		Drilled By: Borehole Solutions		Plant Used: Dando 3000		Logged: KM	Checked: JR	Approved: JR	Scale (m): 1:30	

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: CP101		Page: 2 of 2			
					Project: Berol's Yard, Ashley Road, Tottenham							
Cable Percussive Borehole Log					Date: 05/03/2018 - 06/03/2018		Client: Soil & Water Solutions Ltd					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill
							Depth (m)	Type	Ref	Depth (m)	Results	
Stiff grey CLAY. (LONDON CLAY)			(2.60)		250		6.00	D	11	6.50	SPT(S)N=12 (3,3/3,3,3,3)	
							6.50	D	12			
							7.50	D	13			
							8.00	D	14			
Borehole complete at 8.00 m bgl.		8.00		0.74			8.00 - 8.45	U		8.00	U=39 Blows for 100mm	
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. UXO magnetometer testing undertaken at regular intervals. 4. Borehole terminated at 8.00 m bgl due to UXO 'ferrous anomaly' detected. 5. Casing filled with water to control blowing sand. 6. Logged in general accordance with BS 5930:2015. 7. Borehole backfilled with arisings and reinstated with concrete. 8. SPT trip hammer reference BH04 Er=63%.					Water Stike			Water Level		Chiselling		
					Date	Time	Strike	Duration	Standing	Depth (m)	Time (h:m)	
					05/03/2018		3.00 m	20 min	2.50 m			
Coordinates: E534438.18 N189693.56		Elevation (mAOD): 8.74		Drilled By: Borehole Solutions		Plant Used: Dando 3000		Logged: KM	Checked: JR	Approved: JR	Scale (m): 1:30	

 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01			Hole ID: CP102		Page: 2 of 4			
					Project: Berol's Yard, Ashley Road, Tottenham								
Cable Percussive Borehole Log					Date: 05/03/2018 - 07/03/2018			Client: Soil & Water Solutions Ltd					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill	
							Depth (m)	Type	Ref	Depth (m)	Results		
Stiff grey slightly gravelly CLAY with a low cobble content. (LONDON CLAY)					200		6.00 - 6.45	U	2	6.00	U=35 Blows for 100mm		
							6.45 - 6.50	D	3				
							7.50 - 7.95	D	4	7.50	SPT(S)N=13 (1,2/2,3,4,4)		
							9.00 - 9.45	U	3	9.00	U=45 Blows for 100mm		
							9.45 - 9.50	D	5				
							10.50 - 10.95	D	6	10.50	SPT(S)N=20 (2,4/4,4,5,7)		
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. UXO magnetometer testing undertaken at regular intervals. 4. Borehole terminated at 21.00 m bgl on hard strata. 5. Casing filled with water to control blowing sand. 6. Logged in general accordance with BS 5930:2015. 7. Borehole installed with 50mm diameter standpipe, gas bung and lockable top-hat/ traffic strength flush cover. 8. SPT trip hammer reference BH04 Er=61%.					Water Stike			Water Level		Chiselling			
					Date	Time	Strike	Duration	Standing	Depth (m)	Time (h:m)		
					05/03/2018		3.20 m	20 min					
Coordinates: E534471.88 N189736.32		Elevation (mAOD): 8.72		Drilled By: Bowman Drilling		Plant Used: Dando 1500		Logged: KM	Checked: JR	Approved: JR	Scale (m): 1:30		

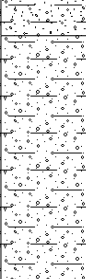
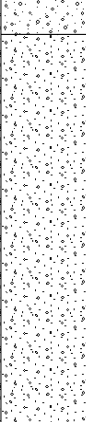
 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: CP102		Page: 3 of 4			
					Project: Berol's Yard, Ashley Road, Tottenham							
Cable Percussive Borehole Log					Date: 05/03/2018 - 07/03/2018		Client: Soil & Water Solutions Ltd					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill
							Depth (m)	Type	Ref	Depth (m)	Results	
Stiff grey slightly gravelly CLAY with a low cobble content. (LONDON CLAY)							12.00 - 12.29	U	4	12.00	U=55 Blows for 100mm	
							12.29 - 12.35	D	7			
							13.50 - 13.95	D	8	13.50	SPT(S)N=22 (3,4/5,5,6,6)	
							15.00 - 15.38	U	5	15.00	U=65 Blows for 100mm	
							15.38 - 15.43	D	9			
							16.50 - 16.95	D	10	16.50	SPT(S)N=23 (3,3/4,5,6,8)	
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. UXO magnetometer testing undertaken at regular intervals. 4. Borehole terminated at 21.00 m bgl on hard strata. 5. Casing filled with water to control blowing sand. 6. Logged in general accordance with BS 5930:2015. 7. Borehole installed with 50mm diameter standpipe, gas bung and lockable top-hat/ traffic strength flush cover. 8. SPT trip hammer reference BH04 Er=61%.					Water Stike			Water Level		Chiselling		
					Date	Time	Strike	Duration	Standing	Depth (m)	Time (h:m)	
					05/03/2018		3.20 m	20 min				
Coordinates: E534471.88 N189736.32		Elevation (mAOD): 8.72		Drilled By: Bowman Drilling		Plant Used: Dando 1500		Logged: KM	Checked: JR	Approved: JR	Scale (m): 1:30	

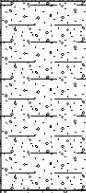
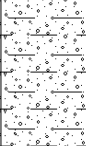
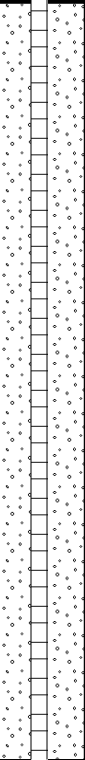
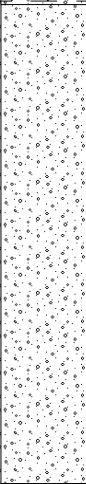
 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: CP102		Page: 4 of 4				
Cable Percussive Borehole Log					Project: Berol's Yard, Ashley Road, Tottenham								
					Date: 05/03/2018 - 07/03/2018		Client: Soil & Water Solutions Ltd						
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill	
							Depth (m)	Type	Ref	Depth (m)	Results		
Stiff grey slightly gravelly CLAY with a low cobble content. (LONDON CLAY)							18.00 - 18.23	U	6	18.00	U=76 Blows for 100mm		
							18.50	D	11				
							19.50 - 19.95	D	12	19.50	SPT(S)N=30 (2,5/5,7,8,10)		
Assumed - no recovery (LAMBETH GROUP)		21.00		-12.28			21.00	U	7	21.00	U=100 Blows for 100mm		
			(0.86)							21.70	SPT(S)50 (4,21/50 for 8mm)		
Borehole complete at 21.86 m bgl.		21.86		-13.14									
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. UXO magnetometer testing undertaken at regular intervals. 4. Borehole terminated at 21.00 m bgl on hard strata. 5. Casing filled with water to control blowing sand. 6. Logged in general accordance with BS 5930:2015. 7. Borehole installed with 50mm diameter standpipe, gas bung and lockable top-hat/ traffic strength flush cover. 8. SPT trip hammer reference BH04 Er=61%.							Water Stike			Water Level		Chiselling	
							Date	Time	Strike	Duration	Standing	Depth (m)	Time (h:m)
							05/03/2018		3.20 m	20 min			
Coordinates: E534471.88 N189736.32		Elevation (mAOD): 8.72		Drilled By: Bowman Drilling		Plant Used: Dando 1500		Logged: KM	Checked: JR	Approved: JR	Scale (m): 1:30		

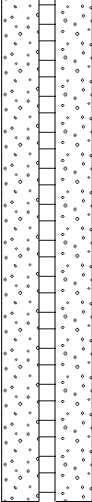
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: DS102		Page: 1 of 1								
					Project: Berol's Yard, Ashley Road, Tottenham												
Dynamic Sampler Log					Date: 09/03/2018		Client: Soil & Water Solutions Ltd										
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill					
							Depth (m)	Type	Ref	Depth (m)	Results						
MADE GROUND: Asphalt. (MADE GROUND)		0.05		8.59			0.40 - 0.50	ES	1								
MADE GROUND: Concrete. (MADE GROUND)		0.30	(0.25)	8.34													
MADE GROUND: Grey sandy angular to sub-rounded fine to coarse GRAVEL of mixed lithology stone, concrete, clinker and rare brick, with common sub-angular and sub-rounded cobbles. (MADE GROUND)		0.80	(0.50)	7.84													
MADE GROUND: Orangish brown very clayey slightly gravelly fine to coarse SAND. Gravel is angular and sub-angular fine to medium brick and sub-rounded and rounded fine to coarse flint. (MADE GROUND)		1.40	(0.60)	7.24													
Orangish brown very clayey gravelly fine to coarse SAND. Gravel is sub-rounded and rounded fine to coarse flint. (ENFIELD SILT MEMBER)		1.80	(0.40)	6.84													
Orangish brown very sandy sub-rounded and rounded fine to coarse flint GRAVEL. (KEMPTON PARK GRAVEL MEMBER)		3.80	(2.00)	4.84													
Orangish brown slightly gravelly fine to coarse SAND. Gravel is sub-rounded and rounded fine to medium flint. (KEMPTON PARK GRAVEL MEMBER)		4.00	(0.20)	4.64													
Borehole complete at 4.00 m bgl.																	
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. Open-hole drilling to 3.0 m bgl to allow for UXO clearance. 4. Casing filled with water to control blowing sand. 5. Logged in general accordance with BS 5930:2015. 6. Borehole installed with 50mm diameter standpipe, gas bung and lockable top-hat/ traffic strength flush cover.								Water Strike					Water Level		Borehole Diameter		
								Date	Time				Depth Strike	Duration	Depth Water	Depth Base	Diameter
Coordinates: E534411.97 N189646.45		Elevation (mAOD): 8.64		Drilled By: Borehole Surveys		Plant Used: Dando Terrier		Logged: RD	Checked: JR	Approved: JR	Scale: 1:30						

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: DS103		Page: 1 of 1										
					Project: Berol's Yard, Ashley Road, Tottenham														
Dynamic Sampler Log					Date: 09/03/2018			Client: Soil & Water Solutions Ltd											
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill							
							Depth (m)	Type	Ref	Depth (m)	Results								
MADE GROUND: Asphalt. (MADE GROUND)		0.05		8.61			0.40 - 0.50	ES	1										
MADE GROUND: Concrete. (MADE GROUND)		0.35	(0.30)	8.31															
MADE GROUND: Grey sandy angular to rounded fine to coarse GRAVEL of mixed lithology stone, concrete and clinker. (MADE GROUND)		0.75	(0.40)	7.91															
MADE GROUND: Brown clayey sandy gravelly SILT. Sand is fine to coarse. Gravel is angular and sub-angular fine to coarse brick and rounded and sub-rounded fine to coarse flint. (MADE GROUND)		0.90	(0.15)	7.76															
Orangish brown clayey slightly gravelly fine to coarse SAND. Gravel is rounded and sub-rounded fine and medium flint. Becoming very gravelly at base. (ENFIELD SILT MEMBER)		1.50		7.16															
Orangish brown very sandy rounded and sub-rounded fine to coarse flint GRAVEL. (KEMPTON PARK GRAVEL MEMBER)		1.70	(0.20)	6.96															
Orangish brown clayey gravelly fine to coarse SAND with occasional rounded flint cobbles. Gravel is rounded and sub-rounded fine to coarse flint. (KEMPTON PARK GRAVEL MEMBER)		2.40	(0.70)	6.26															
Orangish brown very sandy rounded and sub-rounded fine to coarse flint GRAVEL with occasional rounded flint cobbles. (KEMPTON PARK GRAVEL MEMBER)		3.00	(0.60)	5.66															
Borehole complete at 3.00 m bgl.																			
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. Open-hole drilling to 3.0 m bgl to allow for UXO clearance. 4. Casing filled with water to control blowing sand. 5. Logged in general accordance with BS 5930:2015. 6. Borehole installed with 50mm diameter standpipe, gas bung and lockable top-hat/ traffic strength flush cover.																			
						Water Strike			Water Level		Borehole Diameter								
						Date	Time	Depth Strike	Duration	Depth Water	Depth Base	Diameter							
Coordinates: E534417.91 N189680.83		Elevation (mAOD): 8.66		Drilled By: Borehole Surveys		Plant Used: Dando Terrier			Logged: RD	Checked: JR	Approved: JR	Scale: 1:30							

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: DS104		Page: 1 of 1			
					Project: Berol's Yard, Ashley Road, Tottenham							
Dynamic Sampler Log					Date: 08/03/2018 - 09/03/2018		Client: Soil & Water Solutions Ltd					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill
							Depth (m)	Type	Ref	Depth (m)	Results	
MADE GROUND: Concrete. (MADE GROUND)		0.10	(0.10)	9.04			0.20 - 0.30	ES	1			
MADE GROUND: Dark grey very sandy angular and sub-angular GRAVEL of concrete with rare brick and flint. (MADE GROUND)		0.20	(0.10)	8.94								
MADE GROUND: Dark brownish grey clayey silty very gravelly fine to coarse SAND with occasional angular brick cobbles, fragments of glass and pencil lead filaments. Gravel is angular to rounded fine to coarse brick, concrete, charcoal and flint. (MADE GROUND)		0.80	(0.60)	8.34			0.60 - 0.80	ES	2			
MADE GROUND: Orangish brown clayey slightly gravelly fine to coarse SAND with occasional roots. Gravel is subrounded fine to medium flint with rare sub-angular fine to coarse brick. (MADE GROUND)		1.40	(0.60)	7.74								
MADE GROUND: Orangish brown clayey sandy sub-rounded fine to coarse flint GRAVEL. Becomes less clayey with depth. (ENFIELD SILT MEMBER)		2.30	(0.90)	6.84								
Orangish brown very clayey slightly gravelly fine to medium SAND. Gravel is sub-rounded fine to medium flint. (ENFIELD SILT MEMBER)		2.60		6.54								
Yellowish brown mottled dark grey slightly gravelly fine to coarse SAND. Gravel is sub-rounded fine to medium flint. (KEMPTON PARK GRAVEL MEMBER)		3.50	(0.90)	5.64			2.70 - 2.90	ES	3			
Yellowish brown very sandy sub-rounded and rounded fine to coarse flint GRAVEL with occasional rounded flint cobbles. (KEMPTON PARK GRAVEL MEMBER)		4.00		5.14								
Borehole complete at 4.00 m bgl.												
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. Open-hole drilling to 3.0 m bgl to allow for UXO clearance. 4. Casing filled with water to control blowing sand. 5. Logged in general accordance with BS 5930:2015. 6. Borehole installed with 50mm diameter standpipe, gas bung and lockable top-hat/ traffic strength flush cover.					Water Strike			Water Level		Borehole Diameter		
					Date	Time	Depth Strike	Duration	Depth Water	Depth Base	Diameter	
Coordinates: E534464.96 N189693.96		Elevation (mAOD): 9.14		Drilled By: Borehole Surveys		Plant Used: Dando Terrier		Logged: RD	Checked: JR	Approved: JR	Scale: 1:30	

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: DS105		Page: 1 of 1			
					Project: Berol's Yard, Ashley Road, Tottenham							
Dynamic Sampler Log					Date: 08/03/2018		Client: Soil & Water Solutions Ltd					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill
							Depth (m)	Type	Ref	Depth (m)	Results	
MADE GROUND: Concrete. (MADE GROUND)		0.20	(0.20)	8.67								
MADE GROUND: Grey sandy angular and sub-angular fine to coarse concrete GRAVEL. (MADE GROUND)		0.30	(0.10)	8.57			0.30	ES	1			
MADE GROUND: Dark brown silty sandy angular to rounded fine to coarse GRAVEL of concrete, brick and flint with pockets of brown clay, occasional angular brick cobbles and fragments of plastic and pencil lead filaments. (MADE GROUND)		1.20	(0.90)	7.67			1.00 - 1.20	ES	2			
Orangish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-rounded and rounded fine to coarse flint. (ENFIELD SILT MEMBER)		1.40	(0.20)	7.47								
Orangish brown clayey gravelly fine to coarse SAND. Gravel is sub-rounded and rounded fine to coarse flint. (ENFIELD SILT MEMBER)		1.70	(0.30)	7.17			1.50 - 1.60	ES	3			
Orangish brown mottled grey clayey sandy rounded and subrounded fine to coarse flint GRAVEL. Locally clayey gravelly sand. (KEMPTON PARK GRAVEL MEMBER)		2.70	(1.00)	6.17								
Yellowish brown very sandy sub-rounded fine to coarse flint GRAVEL. (KEMPTON PARK GRAVEL MEMBER)		3.00	(0.30)	5.87			2.70 - 2.80	ES	4			
Yellowish brown gravelly medium to coarse SAND. Gravel is rounded and sub-rounded fine to coarse flint. (KEMPTON PARK GRAVEL MEMBER)		4.60	(1.60)	4.27			4.50 - 4.60	ES	5			
Borehole complete at 4.60 m bgl.												
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. Open-hole drilling to 3.0 m bgl to allow for UXO clearance. 4. Blowing sand below 3.0 m bgl. 5. Hole collapsed to 2.6 m bgl on lifting casing. 6. Logged in general accordance with BS 5930:2015. 7. Borehole installed with 50mm diameter standpipe, gas bung and lockable top-hat/ traffic strength flush cover.					Water Strike			Water Level		Borehole Diameter		
					Date	Time	Depth Strike	Duration	Depth Water	Depth Base	Diameter	
Coordinates: E534463.19 N189723.73		Elevation (mAOD): 8.87		Drilled By: Borehole Surveys		Plant Used: Dando Terrier		Logged: RD	Checked: JR	Approved: JR	Scale: 1:30	

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: DS106		Page: 1 of 1			
					Project: Berol's Yard, Ashley Road, Tottenham							
Dynamic Sampler Log					Date: 08/03/2018		Client: Soil & Water Solutions Ltd					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill
							Depth (m)	Type	Ref	Depth (m)	Results	
MADE GROUND: Concrete. (MADE GROUND)		0.15	(0.15)	8.47			0.40 - 0.50	ES	1			
MADE GROUND: Grey angular fine to coarse concrete GRAVEL. (MADE GROUND)		0.25	(0.10)	8.37								
MADE GROUND: Concrete. (MADE GROUND)		0.40	(0.15)	8.22								
MADE GROUND: Dark brown clayey sandy gravelly SILT. Sand is fine to coarse. Gravel is angular to rounded fine to coarse charcoal, flint and rare brick. (MADE GROUND)		0.75	(0.35)	7.87								
Medium dense orangish brown mottled black clayey slightly gravelly fine to coarse SAND. Gravel is sub-rounded fine to medium flint. (ENFIELD SILT MEMBER)		1.50	(0.75)	7.12								
Orangish brown mottled grey clayey sandy rounded and sub-rounded fine to coarse flint GRAVEL. Sand is fine to coarse. (KEMPTON PARK GRAVEL MEMBER)		2.10	(0.60)	6.52			2.50	ES	3			
Yellowish brown very sandy rounded and sub-rounded fine to coarse flint GRAVEL with occasional rounded flint cobbles. Locally clayey. (KEMPTON PARK GRAVEL MEMBER)		4.00	(1.90)	4.62								
Borehole complete at 4.00 m bgl.												
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. Open-hole drilling to 3.0 m bgl to allow for UXO clearance. 4. Casing filled with water to control blowing sand. 5. Borhole refused at 4.0 m bgl. 6. Logged in general accordance with BS 5930:2015. 7. Borehole installed with 50mm diameter standpipe, gas bung and lockable top-hat/ traffic strength flush cover.					Water Strike			Water Level		Borehole Diameter		
					Date	Time	Depth Strike	Duration	Depth Water	Depth Base	Diameter	
					08/03/2018		2.50 m					
Coordinates: E534424.70 N189751.18		Elevation (mAOD): 8.62		Drilled By: Borehole Surveys		Plant Used: Dando Terrier		Logged: RD	Checked: JR	Approved: JR	Scale: 1:30	

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 18-0192.01		Hole ID: WS05 (DS107)		Page: 1 of 1			
					Project: Berol's Yard, Ashley Road, Tottenham							
Dynamic Sampler Log					Date: 09/03/2018		Client: Soil & Water Solutions Ltd					
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details			Test Details		Backfill
							Depth (m)	Type	Ref	Depth (m)	Results	
MADE GROUND: Asphalt. (MADE GROUND)		0.05		8.55								
MADE GROUND: Dark greyish brown very sandy angular and sub-angular GRAVEL of concrete with rare brick and flint. (MADE GROUND)		0.40	(0.35)	8.20								
MADE GROUND: Greyish brown clayey sandy angular to rounded fine to coarse GRAVEL of concrete, brick, clinker and flint. (MADE GROUND)	1.10	(0.70)	7.50									
Orangish brown very clayey slightly gravelly fine to medium SAND. Gravel is sub-rounded fine to medium flint. (ENFIELD SILT MEMBER)	1.90	(0.80)	6.70									
Orangish brown slightly gravelly fine to coarse SAND. Gravel is sub-rounded and rounded fine to medium flint. (ENFIELD SILT MEMBER)	2.40	(0.50)	6.20									
Yellowish brown very sandy rounded and sub-rounded fine to coarse flint GRAVEL with occasional rounded flint cobbles. (KEMPTON PARK GRAVEL MEMBER)	4.00	(1.60)	4.60									
Borehole complete at 4.00 m bgl.												
Remarks: 1. Area cleared for services prior to drilling. 2. Hydraulic breaker used to break-out concrete. 3. Open-hole drilling to 3.0 m bgl to allow for UXO clearance. 4. Casing filled with water to control blowing sand. 5. Logged in general accordance with BS 5930:2015. 6. Borehole installed with 50mm diameter standpipe, gas bung and lockable top-hat/ traffic strength flush cover.					Water Strike			Water Level		Borehole Diameter		
					Date	Time	Depth Strike	Duration	Depth Water	Depth Base	Diameter	
Coordinates: E534455.00 N189634.00		Elevation (mAOD): 8.60		Drilled By: Borehole Surveys		Plant Used: Dando Terrier		Logged: RD	Checked: JR	Approved: JR	Scale: 1:30	

SPT Hammer Ref: DEL1
Test Date: 01/03/2017
Report Date: 02/03/2017
File Name: DEL1.spt
Test Operator: GW



Instrumented Rod Data

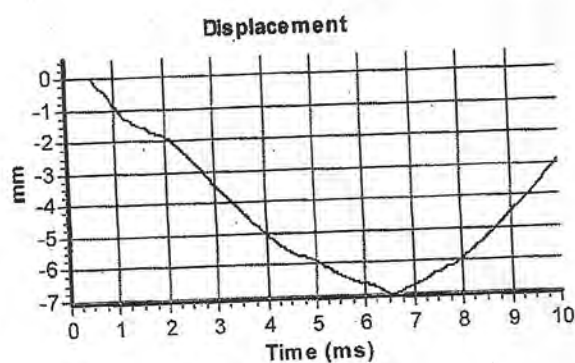
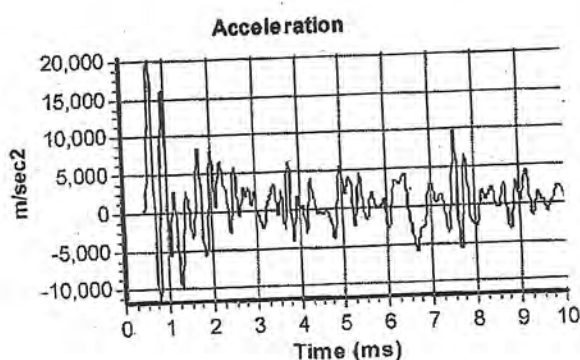
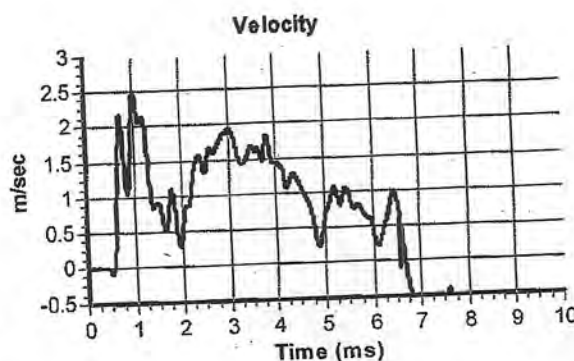
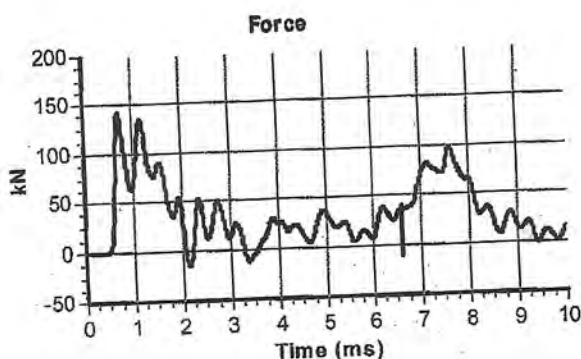
Diameter d_r (mm): 67
Wall Thickness t_r (mm): 8.4
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 6469
Accelerometer No.2: 11406

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 13.6

Comments / Location

Mass and Height supplied by client.



Calculations

Area of Rod A (mm²): 1546
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 287

Energy Ratio E_r (%):

61

Signed: Gareth Wear

Title: Chief Laboratory Technician

The recommended calibration interval is 6 months

Appendix C – Geotechnical Analysis Results



TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard , Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 05/03/2018
Date Received: 08/03/2018
Date Tested: 28/03/2018
Sampled By: KM/RD

TEST RESULTS

Laboratory Reference: 929605
Sample Reference: Not Given

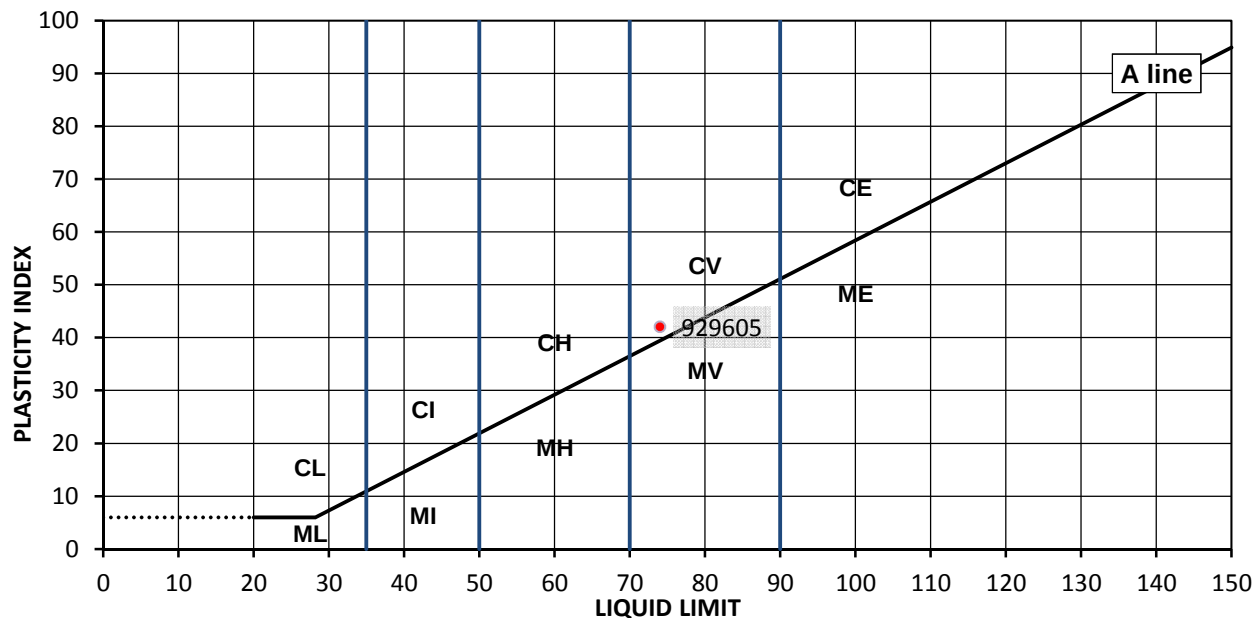
Description: Dark brown slightly gravelly CLAY

Location: CP102

Sample Preparation: Tested after washing to remove >425um

Sample Type: B
Depth Top [m]: 5.60
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
31	74	32	42	96



Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard , Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

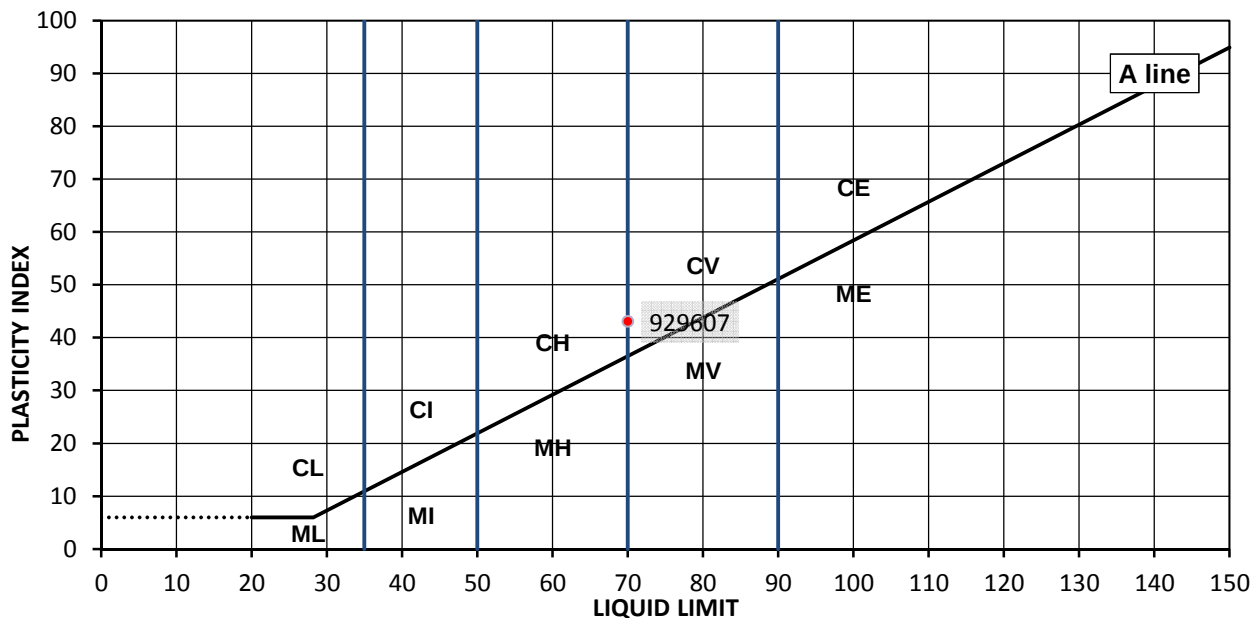
TEST RESULTS

Laboratory Reference: 929607
Sample Reference: Not Given

Description: Dark brown CLAY
Location: CP102
Sample Preparation: Tested in natural condition

Sample Type: U
Depth Top [m]: 9.00
Depth Base [m]: 9.45

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
26	70	27	43	100



Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

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Contact: Kirsten Mills
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Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
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Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

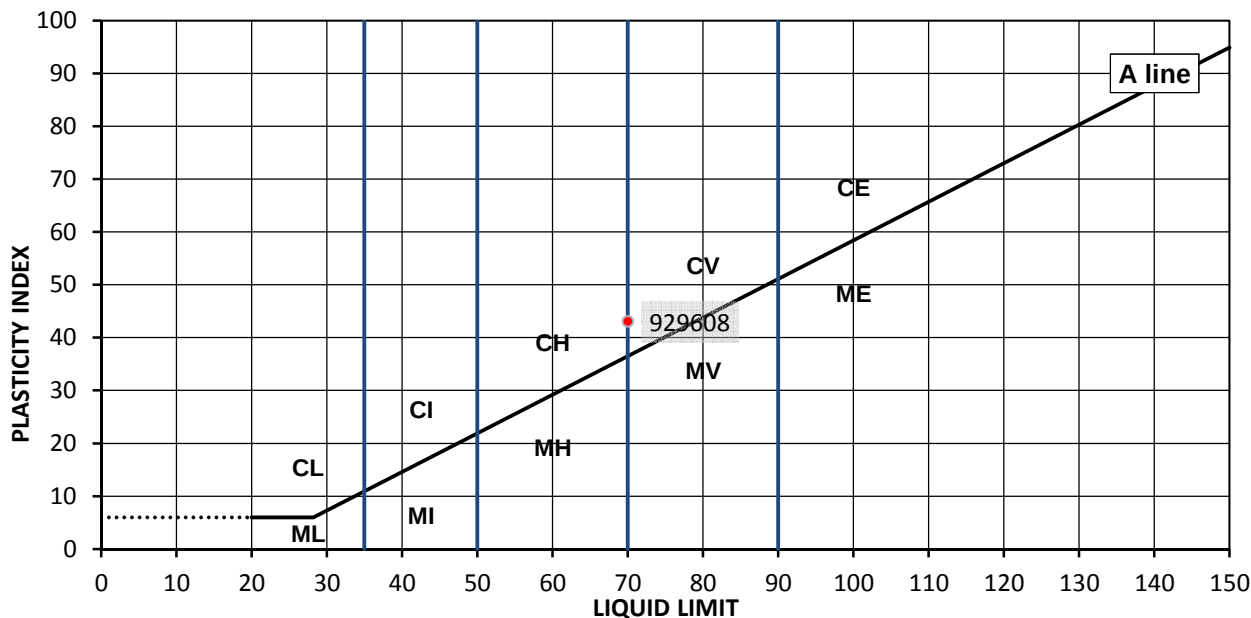
TEST RESULTS

Laboratory Reference: 929608
Sample Reference: Not Given

Description: Dark brown CLAY
Location: CP102
Sample Preparation: Tested in natural condition

Sample Type: U
Depth Top [m]: 12.00
Depth Base [m]: 12.29

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
27	70	27	43	100



Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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Client Address: 3 Henley Office Park
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Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard , Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

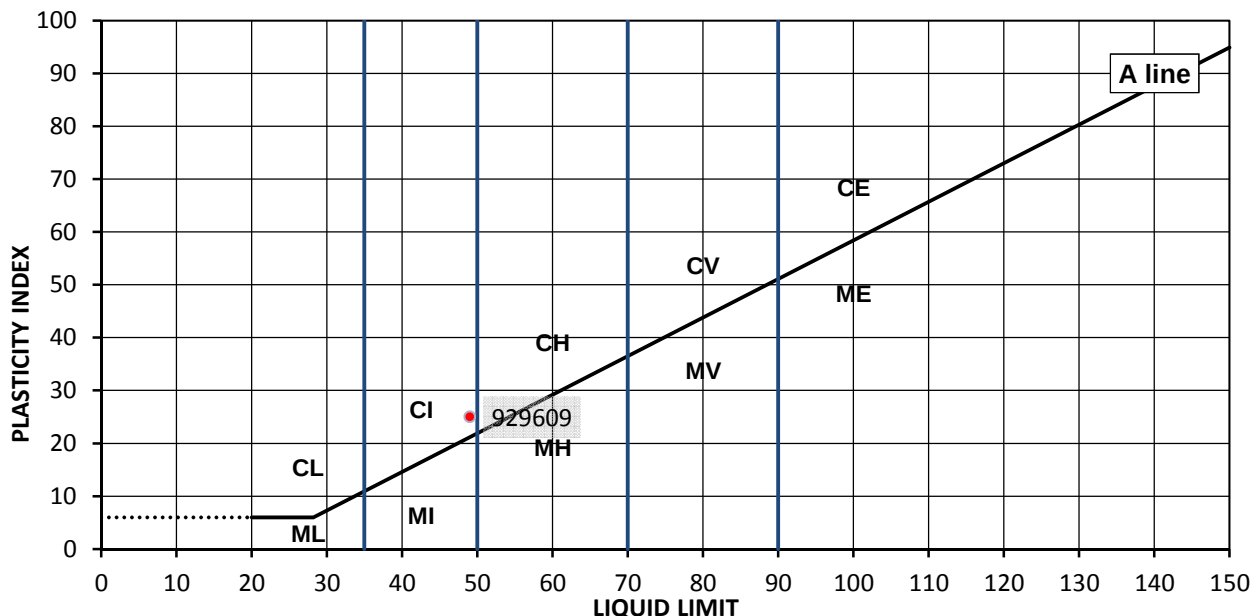
TEST RESULTS

Laboratory Reference: 929609
Sample Reference: Not Given

Description: Dark brown slightly sandy CLAY
Location: CP102
Sample Preparation: Tested in natural condition

Sample Type: U
Depth Top [m]: 15.00
Depth Base [m]: 15.38

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
31	49	24	25	100



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C Clay	L Low	below 35
M Silt	I Medium	35 to 50
	H High	50 to 70
	V Very high	70 to 90
	E Extremely high	exceeding 90
Organic	O	append to classification for organic material (eg CHO)

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 05/04/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard , Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

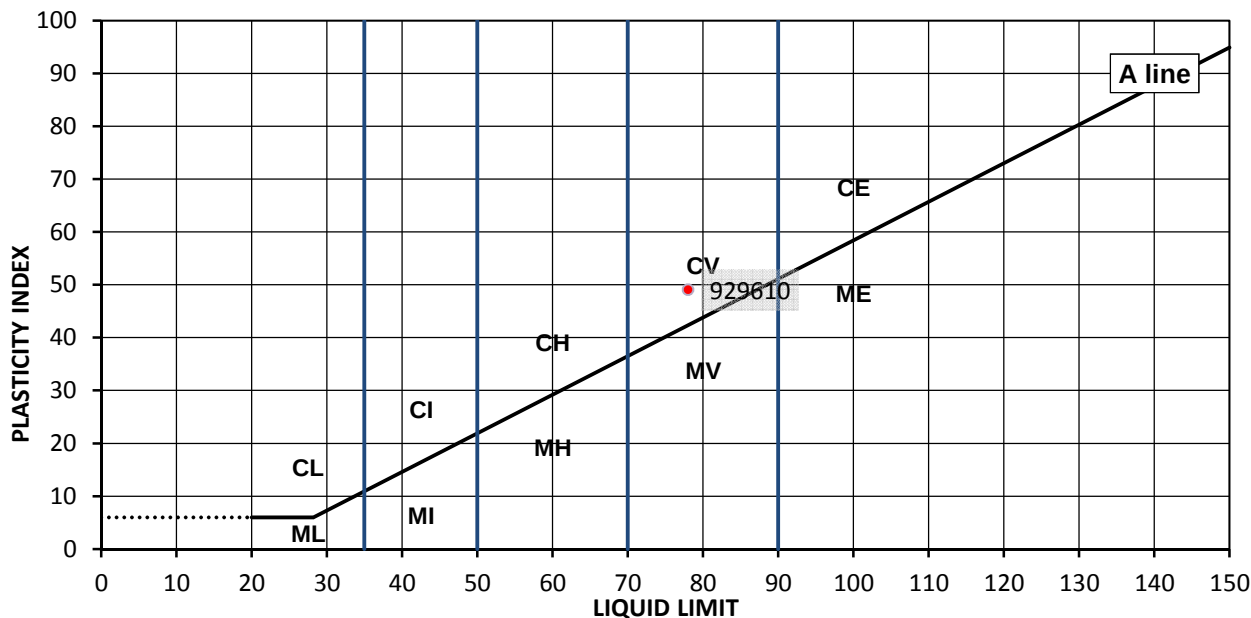
TEST RESULTS

Laboratory Reference: 929610
Sample Reference: Not Given

Description: Dark grey CLAY
Location: CP102
Sample Preparation: Tested in natural condition

Sample Type: U
Depth Top [m]: 18.00
Depth Base [m]: 18.23

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
43	78	29	49	100



Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 05/04/2018

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Watford Herts WD18 8YS



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Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard , Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 28/03/2018
Sampled By: KM/RD

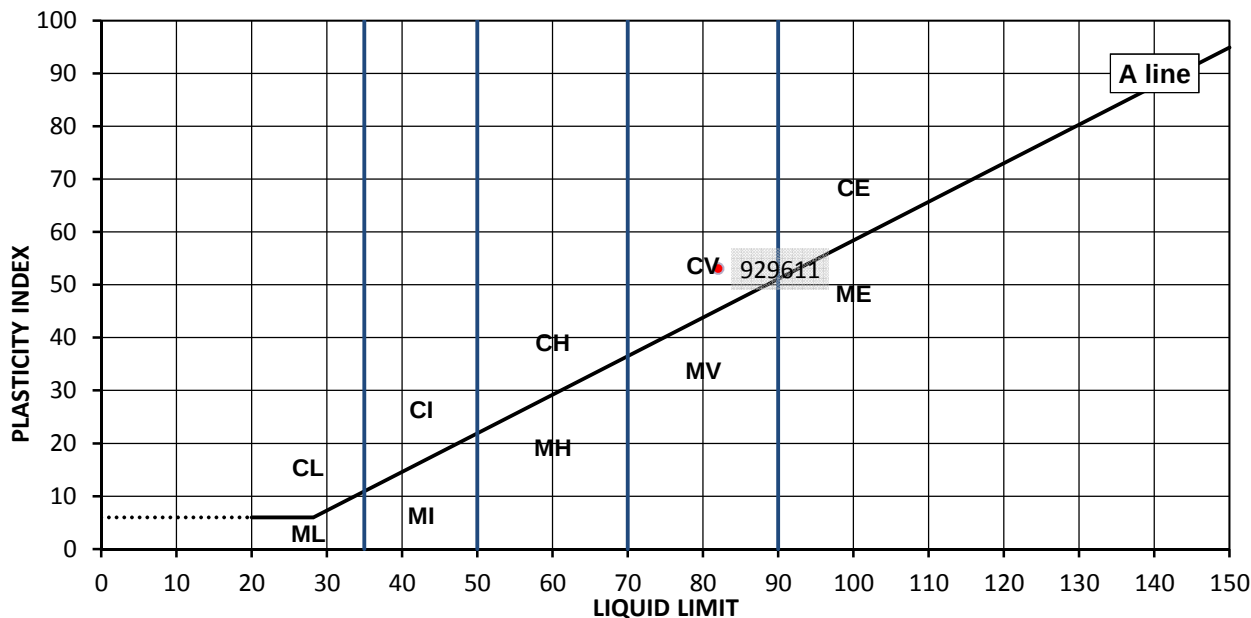
TEST RESULTS

Laboratory Reference: 929611
Sample Reference: Not Given

Description: Dark brown CLAY
Location: CP102
Sample Preparation: Tested in natural condition

Sample Type: D
Depth Top [m]: 19.50
Depth Base [m]: 19.95

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
25	82	29	53	100



Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
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Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

Client: Delta-Simons
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Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard , Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 28/03/2018
Sampled By: KM/RD

TEST RESULTS

Laboratory Reference: 929612
Sample Reference: Not Given

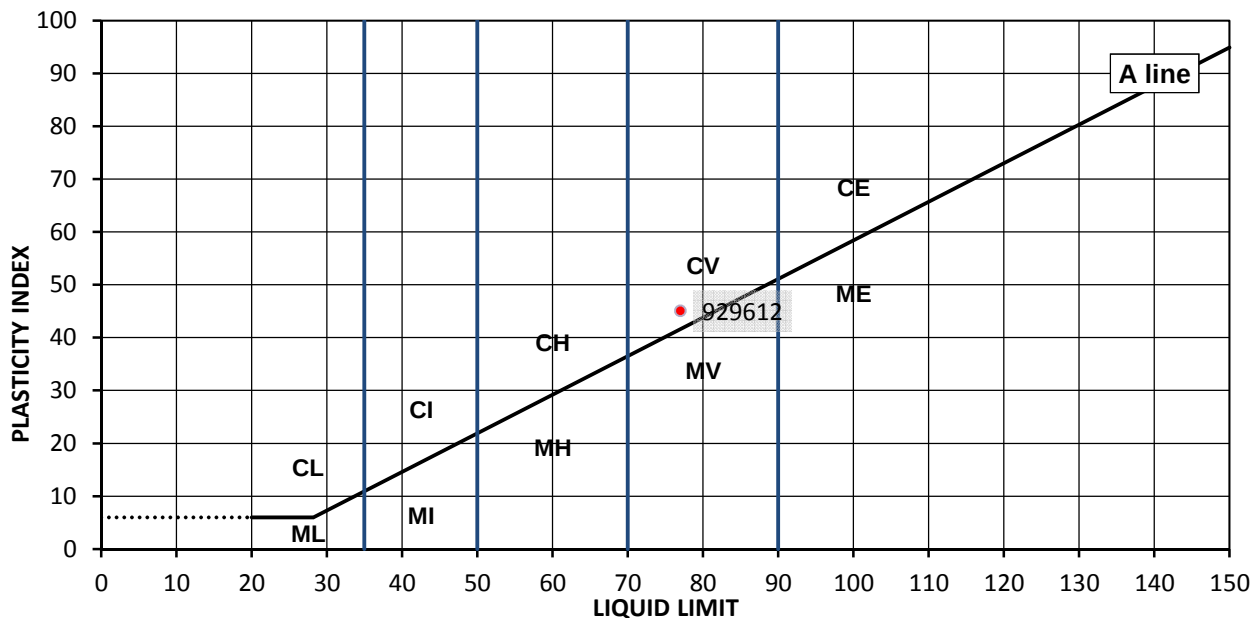
Description: Dark brown slightly gravelly CLAY

Location: CP101

Sample Preparation: Tested after >425um removed by hand

Sample Type: D
Depth Top [m]: 6.50
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
33	77	32	45	99



Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 05/04/2018

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Determination of Liquid and Plastic Limits

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Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard , Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

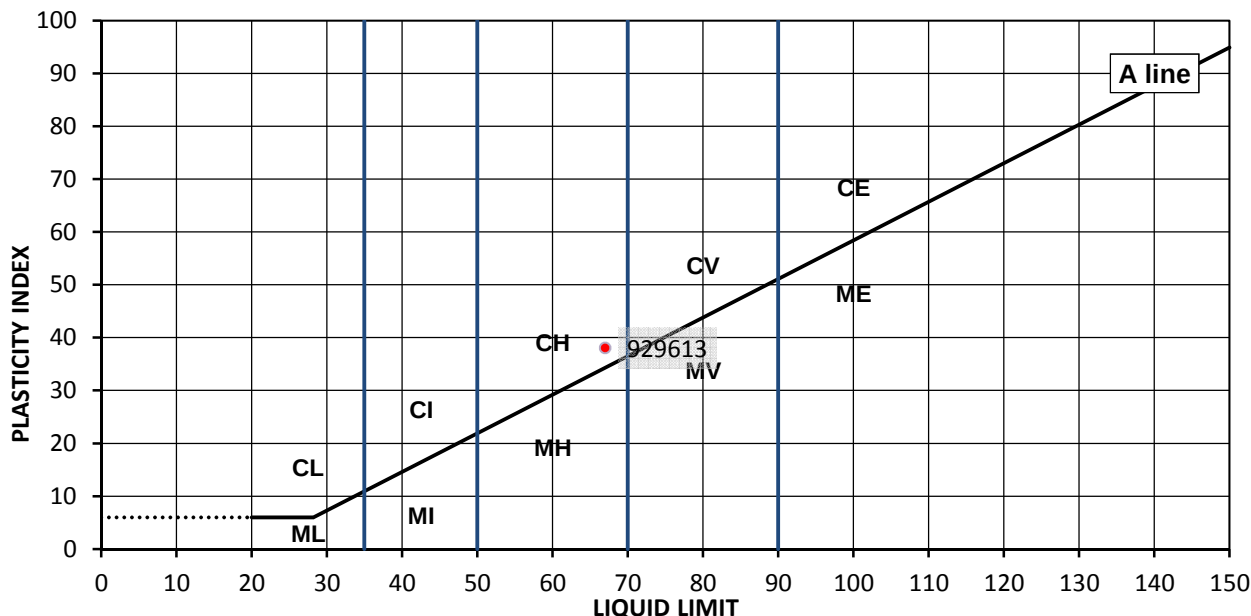
TEST RESULTS

Laboratory Reference: 929613
Sample Reference: Not Given

Description: Dark grey CLAY
Location: CP101
Sample Preparation: Tested in natural condition

Sample Type: U
Depth Top [m]: 8.00
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
28	67	29	38	100



Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

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TEST CERTIFICATE

Summary of Classification Test Results

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard , Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 05/03 - 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03 - 28/03/2018
Sampled By: KM/RD

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	Density		M/C	Atterberg				PD
		Reference	Top depth [m]	Base depth [m]	Type		bulk	dry		% Passing 425um	LL	PL	PI	
							Mg/m3	Mg/m3		%	%	%	%	%
929612	CP101	Not Given	6.50	Not Given	D	Dark brown slightly gravelly CLAY			33	99	77	32	45	
929613	CP101	Not Given	8.00	Not Given	U	Dark grey CLAY			28	100	67	29	38	
929605	CP102	Not Given	5.60	Not Given	B	Dark brown slightly gravelly CLAY			31	96	74	32	42	
929607	CP102	Not Given	9.00	9.45	U	Dark brown CLAY			26	100	70	27	43	
929608	CP102	Not Given	12.00	12.29	U	Dark brown CLAY			27	100	70	27	43	
929609	CP102	Not Given	15.00	15.38	U	Dark brown slightly sandy CLAY			31	100	49	24	25	
929610	CP102	Not Given	18.00	18.23	U	Dark grey CLAY			43	100	78	29	49	
929611	CP102	Not Given	19.50	19.95	D	Dark brown CLAY			25	100	82	29	53	

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



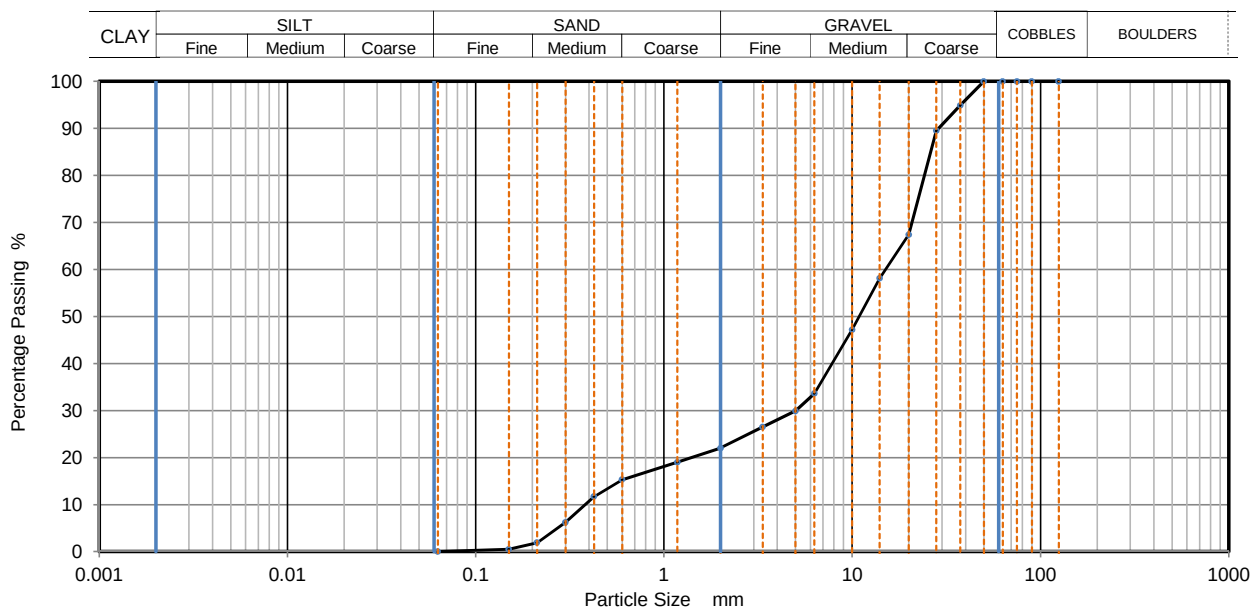
Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard, Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 05/03/2018
Date Received: 08/03/2018
Date Tested: 27/03/2018
Sampled By: KM/RD

TEST RESULTS

Laboratory Reference: 929603
Sample description: Yellowish brown very sandy GRAVEL
Location: CP102
Supplier: Not Given

Sample Reference: Not Given
Sample Type: B
Depth Top [m]: 3.00
Depth Base [m]: 3.50



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	90		
20	67		
14	58		
10	47		
6.3	34		
5	30		
3.35	27		
2	22		
1.18	19		
0.6	15		
0.425	12		
0.3	6		
0.212	2		
0.15	1		
0.063	0		

Dry Mass of sample [g]: 5325

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	78.00
Sand	22.10
Fines <0.063mm	0.00

Grading Analysis	
D100	mm 50
D60	mm 15.1
D30	mm 5.04
D10	mm 0.381
Uniformity Coefficient	39
Curvature Coefficient	4.4

Remarks

Preparation and testing in accordance with BS1377 unless noted below
The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 05/04/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE**Determination of Particle Size Distribution**

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

i2 Analytical Ltd
7 Woodshots Meadow
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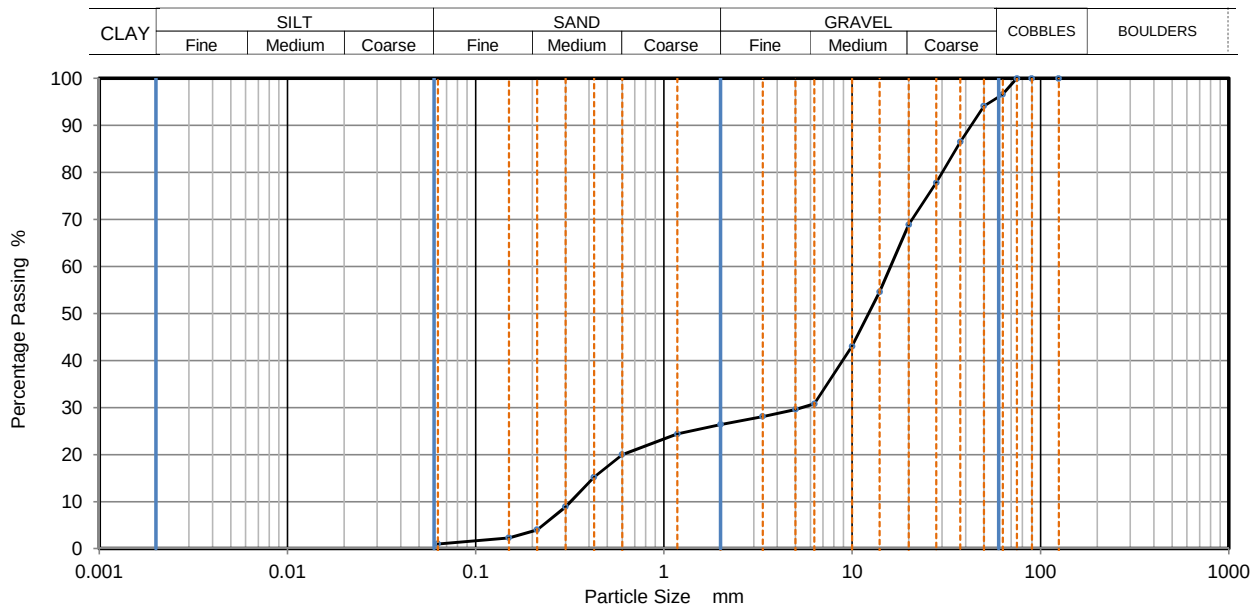
Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard, Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 05/03/2018
Date Received: 08/03/2018
Date Tested: 28/03/2018
Sampled By: KM/RD

TEST RESULTS

Laboratory Reference: 929604
Sample description: Yellowish brown very sandy GRAVEL
Location: CP102
Supplier: Not Given

Sample Reference: Not Given
Sample Type: B
Depth Top [m]: 4.50
Depth Base [m]: 5.00



Dry Mass of sample [g]: 12754

Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	97		
50	94		
37.5	87		
28	78		
20	69		
14	55		
10	43		
6.3	31		
5	30		
3.35	28		
2	26		
1.18	24		
0.6	20		
0.425	15		
0.3	9		
0.212	4		
0.15	2		
0.063	1		

Sample Proportions		% dry mass
Very coarse		3.40
Gravel		70.30
Sand		25.00
Fines <0.063mm		1.40

Grading Analysis		
D100	mm	75
D60	mm	16
D30	mm	5.4
D10	mm	0.319
Uniformity Coefficient		50
Curvature Coefficient		5.7

Remarks

Preparation and testing in accordance with BS1377 unless noted below
The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Darren Berrill
Geotechnical General
Manager

Date Reported: 05/04/2018

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TEST CERTIFICATE

One Dimensional Consolidation Test

Tested in Accordance with BS1377: Part 5: 1990 Clause 3

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

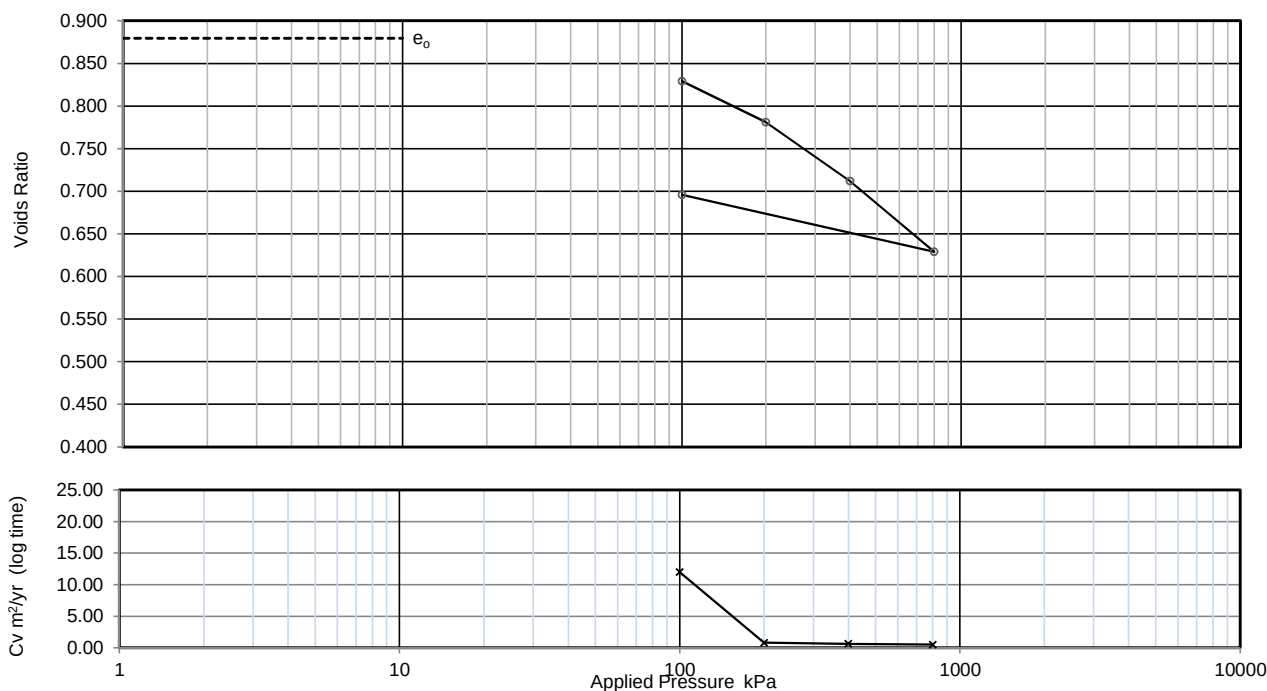
Client:	Delta-Simons
Client Address:	3 Henley Office Park Doddington Road Lincoln LN6 3QR
Contact:	Kirsten Mills
Site Name:	Berols Yard , Tottenham
Site Address:	Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

Test Results

Laboratory Reference:	929606
Hole No.:	CP102
Sample Reference:	Not Given
Sample Description:	Dark brown CLAY

Depth Top [m]: 6.00
Depth Base [m]: 6.45
Sample Type: U

[illegible]

Preparation

Index tests	Liquid limit:	N/A	%	Plastic limit:	N/A	%
Orientation of the sample					Vertical	
Particle density			assumed		2.65	Mg/m3

Specimen details

Diameter	50.02	-	mm
Height	19.96	18.01	mm
Moisture Content	36.0	32.0	%
Bulk density	1.91	2.06	Mg/m3
Dry density	1.41	1.56	Mg/m3
Voids Ratio	0.879	0.696	
Saturation	107	120	%
Average temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%

Remarks

Note: C_v corrected to 20°C

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

One Dimensional Consolidation Test

Tested in Accordance with BS1377: Part 5: 1990 Clause 3

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

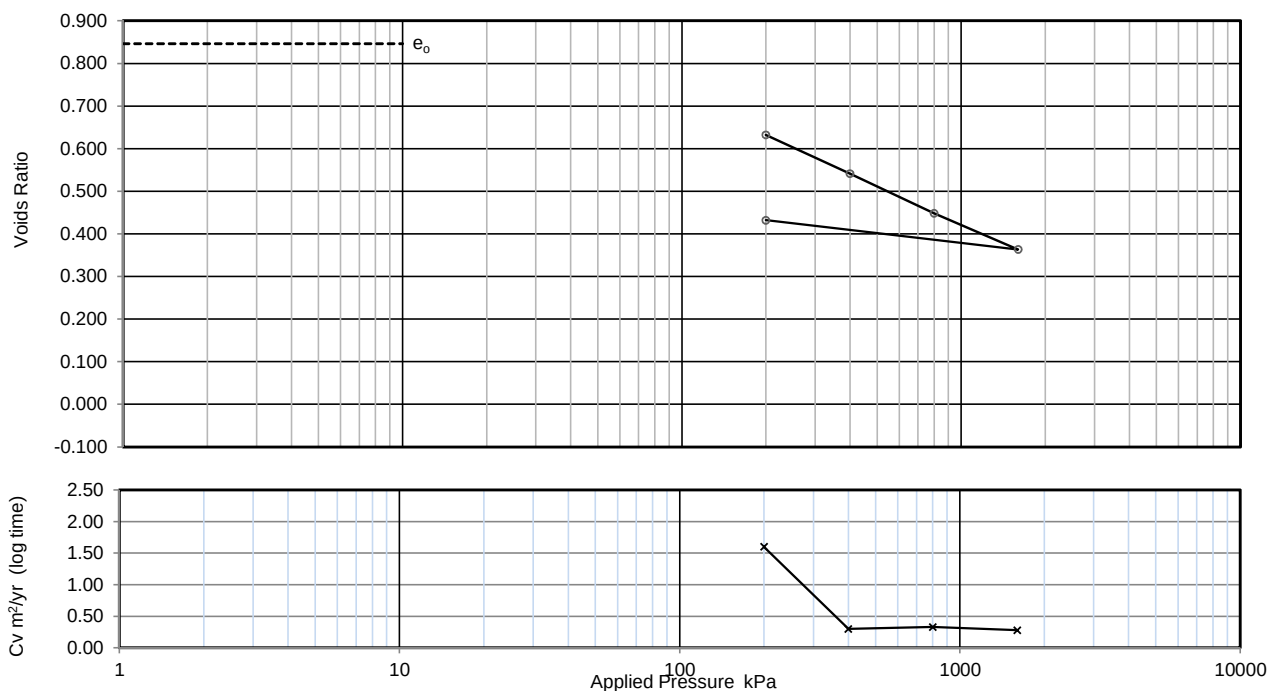
Client:	Delta-Simons
Client Address:	3 Henley Office Park Doddington Road Lincoln LN6 3QR
Contact:	Kirsten Mills
Site Name:	Berols Yard , Tottenham
Site Address:	Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

Test Results

Laboratory Reference:	929607
Hole No.:	CP102
Sample Reference:	Not Given
Sample Description:	Dark brown CLAY

Depth Top [m]: 9.00
Depth Base [m]: 9.45
Sample Type: U

[illegible]

Preparation

Index tests	Liquid limit:	70	%	Plastic limit:	27	%
Orientation of the sample				Vertical		
Particle density		assumed		2.65		Mg/m ³

Specimen details

Diameter	50.02	-	mm
Height	20.00	15.52	mm
Moisture Content	26.0	23.0	%
Bulk density	1.81	2.27	Mg/m3
Dry density	1.44	1.85	Mg/m3
Voids Ratio	0.846	0.432	
Saturation	82	139	%
Average temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%

Remarks

Note: C_v corrected to 20°C

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

One Dimensional Consolidation Test

Tested in Accordance with BS1377: Part 5: 1990 Clause 3

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



4041

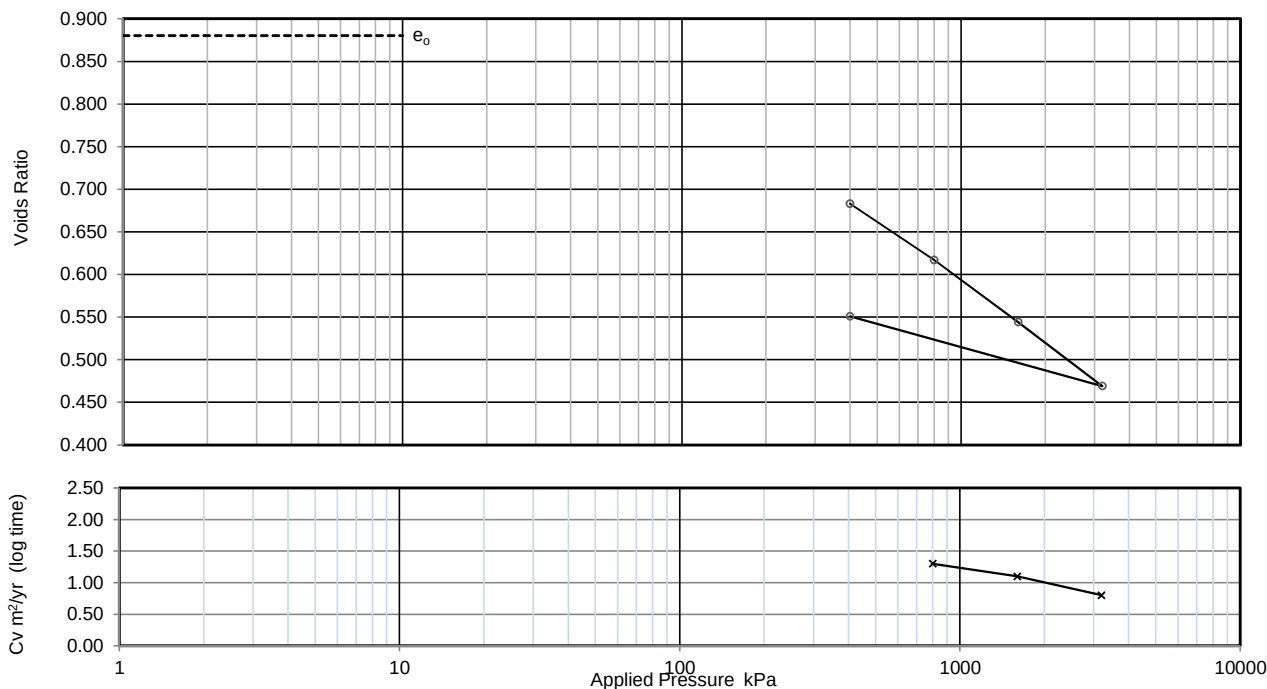
Client:	Delta-Simons
Client Address:	3 Henley Office Park Doddington Road Lincoln LN6 3QR
Contact:	Kirsten Mills
Site Name:	Berols Yard , Tottenham
Site Address:	Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

Test Results

Laboratory Reference:	929610
Hole No.:	CP102
Sample Reference:	Not Given
Sample Description:	Dark grey CLAY

Depth Top [m]: 18.00
Depth Base [m]: 18.23
Sample Type: U

[illegible]

Preparation

Index tests	Liquid limit:	78	%	Plastic limit:	29	%
Orientation of the sample				Vertical		
Particle density		assumed		2.65		Mg/m3

Specimen details

Diameter	50.00	-	mm
Height	20.00	16.50	mm
Moisture Content	43.0	23.0	%
Bulk density	2.01	2.11	Mg/m3
Dry density	1.41	1.71	Mg/m3
Voids Ratio	0.880	0.551	
Saturation	128	112	%
Average temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%

Remarks

Note: C_v corrected to 20°C

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression - multistage test

BS1377: Part 7: 1990, clause 9, multistage test on a single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard, Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 05/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

Test Result

Laboratory Reference: 929602
Hole No.: CP102
Sample Reference: Not Given
Sample Description: Yellowish brown very gravelly CLAY

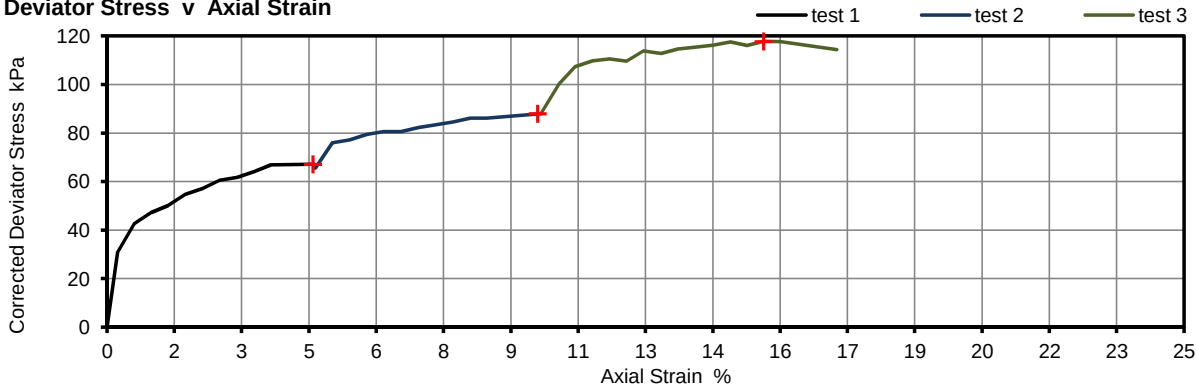
Depth Top [m]: 1.50
Depth Base [m]: 1.73
Sample Type: U

Length	96.50	mm
Diameter	48.40	mm
Bulk Density	1.94	Mg/m ³
Moisture Content	11	%
Dry Density	1.75	Mg/m ³
Membrane thickness	0.24	mm

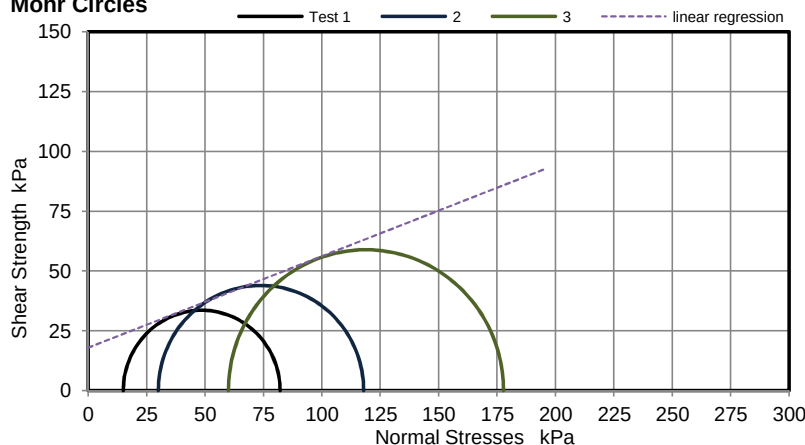
Rate of Strain
Stage Number
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$)_f
Shear strength, c_u
Mode of failure
Membrane Correction

2.00	% / min		
1	2	3	
15	30	60	kPa
4.8	10.0	15.2	%
67	88	118	kPa
34	44	59	kPa
Compound			
0.65	1.10	1.53	kPa

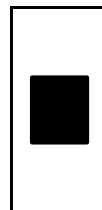
Deviator Stress v Axial Strain



Mohr Circles



Position
within
sample



Notes:

Mohr circles and their interpretation is not covered by BS1377. These are provided for information only.

Linear Regression
 ϕ_u 20.9 °
 c_u 18 kPa

Remarks

Correction values: 15kPa = 7N, 30kPa = 16N, 60kPa = 31N

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression - multistage test

BS1377: Part 7: 1990, clause 9, multistage test on a single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard, Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

Test Result

Laboratory Reference: 929606
Hole No.: CP102
Sample Reference: Not Given
Sample Description: Dark brown CLAY

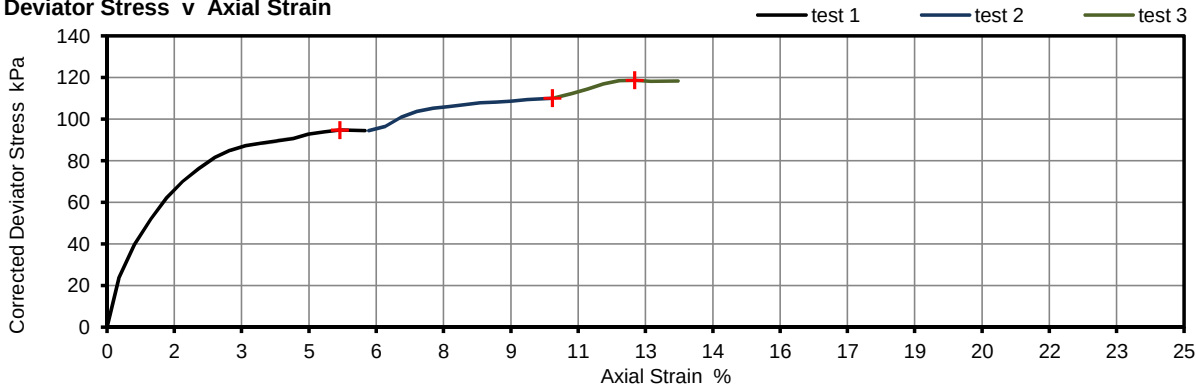
Depth Top [m]: 6.00
Depth Base [m]: 6.45
Sample Type: U

Length	218.40	mm
Diameter	100.50	mm
Bulk Density	1.89	Mg/m ³
Moisture Content	36	%
Dry Density	1.40	Mg/m ³
Membrane thickness	0.25	mm

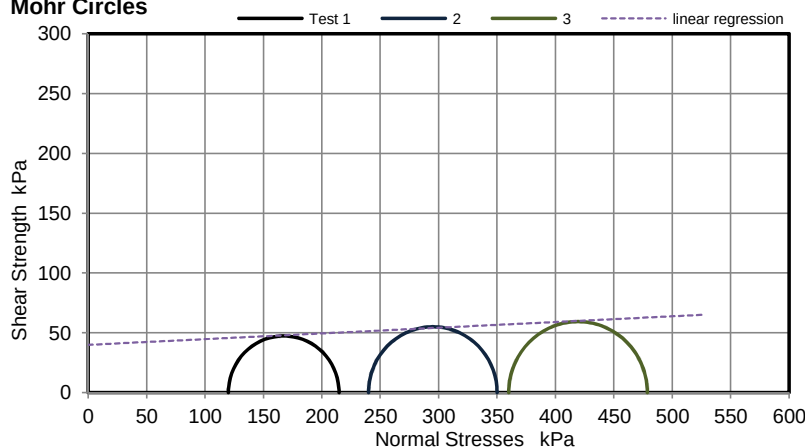
Rate of Strain
Stage Number
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$) f
Shear strength, cu
Mode of failure
Membrane Correction

1.83			%/min
1	2	3	
120	240	360	kPa
5.4	10.3	12.3	%
95	110	119	kPa
47	55	59	kPa
Brittle			
0.37	0.57	0.64	kPa

Deviator Stress v Axial Strain



Mohr Circles



Position
within
sample



Notes:

Mohr circles and their interpretation is not covered by BS1377. These are provided for information only.

Linear Regression

ϕ_u 2.7 °
cu 40 kPa

Remarks

Correction values: 120kPa = 61N, 240kPa = 122N, 360kPa = 178N

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression - multistage test

BS1377: Part 7: 1990, clause 9, multistage test on a single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard, Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

Test Result

Laboratory Reference: 929607
Hole No.: CP102
Sample Reference: Not Given
Sample Description: Dark brown CLAY

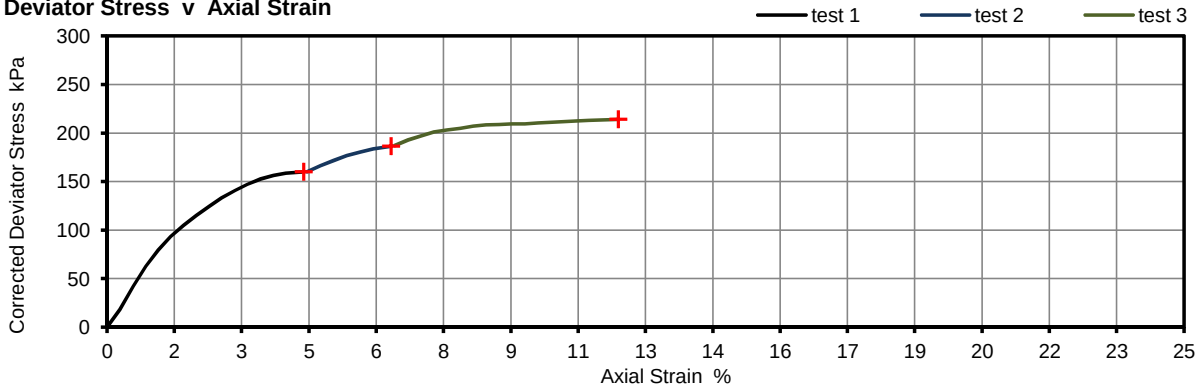
Depth Top [m]: 9.00
Depth Base [m]: 9.45
Sample Type: U

Length	200.10	mm
Diameter	102.50	mm
Bulk Density	1.97	Mg/m ³
Moisture Content	26	%
Dry Density	1.56	Mg/m ³
Membrane thickness	0.21	mm

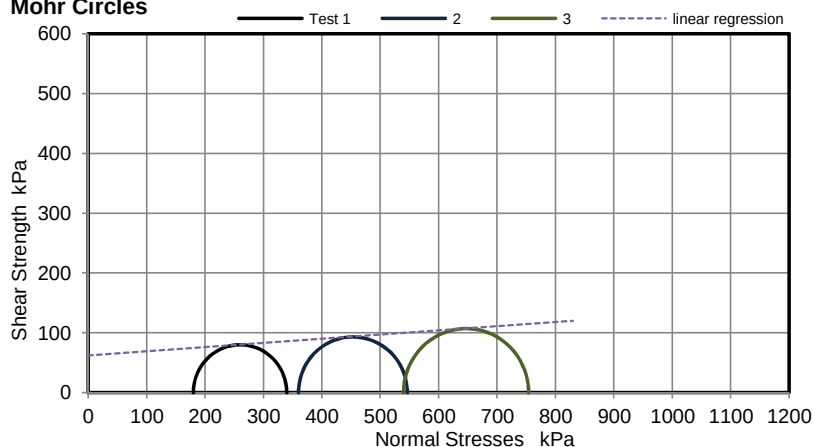
Rate of Strain
Stage Number
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$)_f
Shear strength, c_u
Mode of failure
Membrane Correction

2.00	% / min		
1	2	3	
180	360	540	kPa
4.6	6.6	11.9	%
160	186	214	kPa
80	93	107	kPa
Brittle			
0.26	0.34	0.52	kPa

Deviator Stress v Axial Strain



Mohr Circles



Position
within
sample



Notes:

Mohr circles and their interpretation is not covered by BS1377. These are provided for information only.

Linear Regression
 ϕ_u 4.0 °
 c_u 62 kPa

Remarks

Correction values: 180kPa = 91N, 360kPa = 178N, 540kPa = 269N

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression - multistage test

BS1377: Part 7: 1990, clause 9, multistage test on a single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard, Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

Test Result

Laboratory Reference: 929608
Hole No.: CP102
Sample Reference: Not Given
Sample Description: Dark brown CLAY

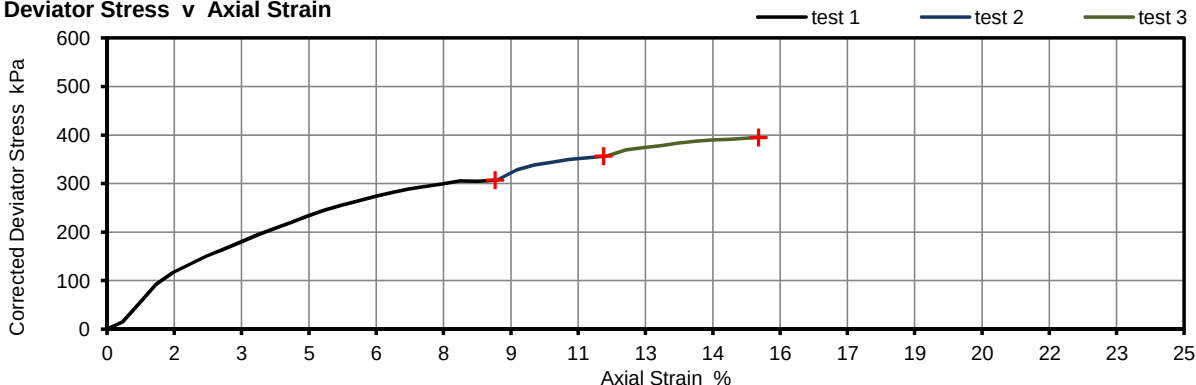
Depth Top [m]: 12.00
Depth Base [m]: 12.29
Sample Type: U

Length	193.60	mm
Diameter	101.60	mm
Bulk Density	2.04	Mg/m ³
Moisture Content	27	%
Dry Density	1.61	Mg/m ³
Membrane thickness	0.21	mm

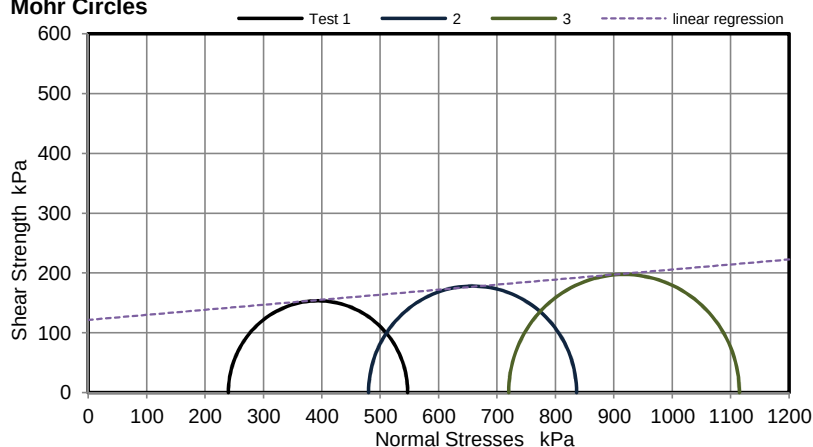
Rate of Strain
Stage Number
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$) f
Shear strength, cu
Mode of failure
Membrane Correction

2.00			%/min
1	2	3	
240	480	720	kPa
9.0	11.5	15.1	%
307	356	395	kPa
154	178	198	kPa
Brittle			
0.43	0.51	0.63	kPa

Deviator Stress v Axial Strain



Mohr Circles



Position
within
sample



Notes:

Mohr circles and their interpretation is not covered by BS1377. These are provided for information only.

Linear Regression
 ϕ_u 4.8 °
cu 122 kPa

Remarks

Correction values: 240kPa = 110N, 480kPa = 240N, 720kPa = 360N

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression - multistage test

BS1377: Part 7: 1990, clause 9, multistage test on a single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard, Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

Test Result

Laboratory Reference: 929609
Hole No.: CP102
Sample Reference: Not Given
Sample Description: Dark brown slightly sandy CLAY

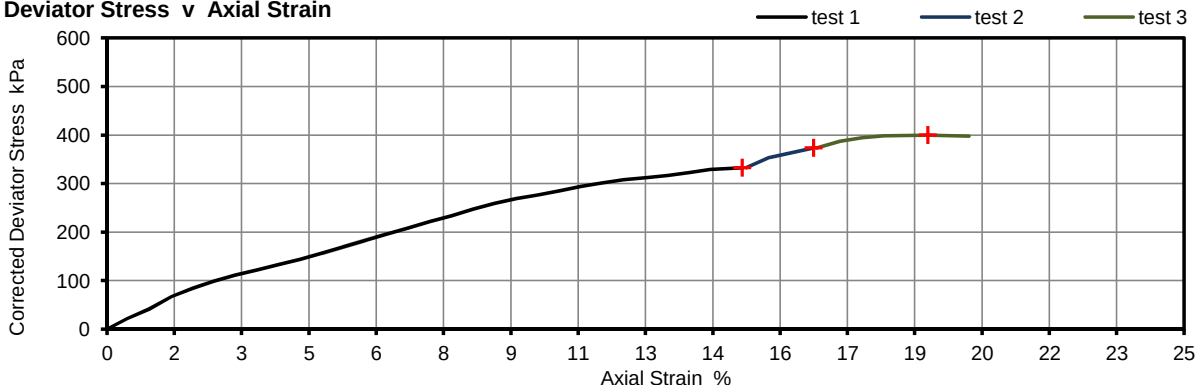
Depth Top [m]: 15.00
Depth Base [m]: 15.38
Sample Type: U

Length	198.60	mm
Diameter	102.50	mm
Bulk Density	2.03	Mg/m3
Moisture Content	31	%
Dry Density	1.56	Mg/m3
Membrane thickness	0.23	mm

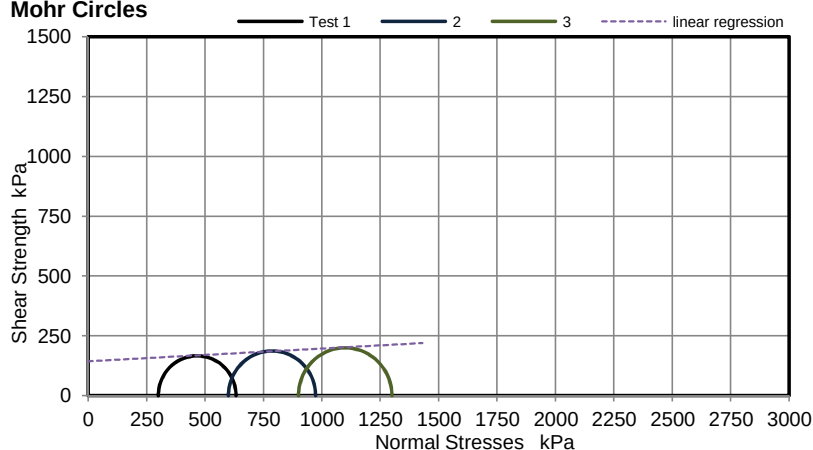
Rate of Strain
Stage Number
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$) f
Shear strength, cu
Mode of failure
Membrane Correction

2.00				%/min
1	2	3		
300	600	900		kPa
14.7	16.4	19.1		%
333	374	400		kPa
166	187	200		kPa
Brittle				
0.67	0.73	0.83		kPa

Deviator Stress v Axial Strain



Mohr Circles



Position
within
sample



Notes:

Mohr circles and their interpretation is not covered by BS1377. These are provided for information only.

Linear Regression

ϕ_u 3.0 °
cu 143 kPa

Remarks

Correction values: 300kPa = 150N, 600kPa = 300N, 900kPa = 460N

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."



TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression - multistage test

BS1377: Part 7: 1990, clause 9, multistage test on a single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Delta-Simons
Client Address: 3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR
Contact: Kirsten Mills
Site Name: Berols Yard, Tottenham
Site Address: Not Given

Client Reference: 18-0192-01
Job Number: 18-79730
Date Sampled: 06/03/2018
Date Received: 08/03/2018
Date Tested: 26/03/2018
Sampled By: KM/RD

Test Result

Laboratory Reference: 929613
Hole No.: CP101
Sample Reference: Not Given
Sample Description: Dark grey CLAY

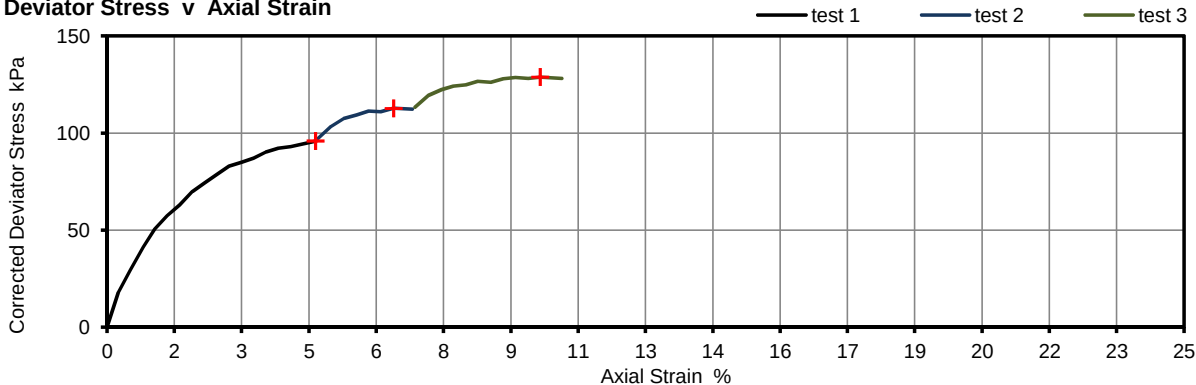
Depth Top [m]: 8.00
Depth Base [m]: Not Given
Sample Type: U

Length	206.30	mm
Diameter	103.50	mm
Bulk Density	1.90	Mg/m ³
Moisture Content	28	%
Dry Density	1.49	Mg/m ³
Membrane thickness	0.23	mm

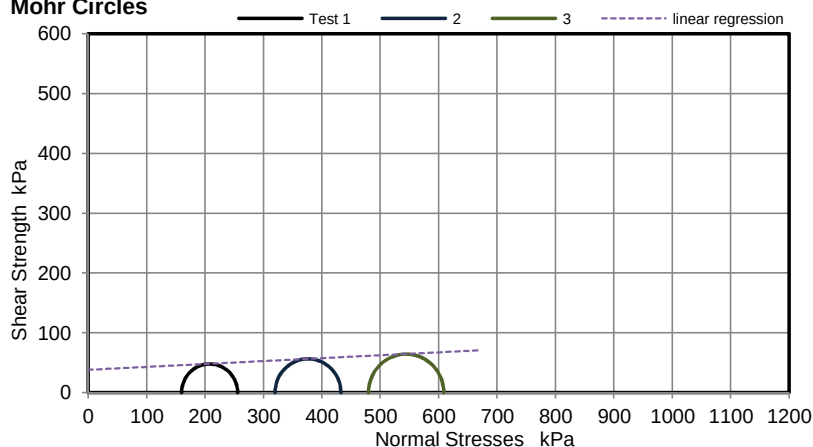
Rate of Strain
Stage Number
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$) f
Shear strength, cu
Mode of failure
Membrane Correction

1.94			%/min
1	2	3	
160	320	480	kPa
4.8	6.7	10.1	%
96	113	129	kPa
48	56	64	kPa
Brittle			
0.29	0.37	0.50	kPa

Deviator Stress v Axial Strain



Mohr Circles



Position
within
sample



Notes:

Mohr circles and their interpretation is not covered by BS1377. These are provided for information only.

Linear Regression
 ϕ_u 2.8 °
cu 38 kPa

Remarks

Correction values: 160kPa = 80N, 320kPa = 150N, 480kPa = 250N

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 05/04/2018

Signed:

Darren Berrill
Geotechnical General
Manager

for and on behalf of i2 Analytical Ltd

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Appendix D – Soil Chemical Analysis Results

**Russell Davies**

Delta-Simons
3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR

e: Russell.Davies@deltasimons.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 18-78895

Replaces Analytical Report Number : 18-78895, issue no. 1

Project / Site name:	Berols Yard, Tottenham	Samples received on:	12/03/2018
Your job number:	18-0192.01	Samples instructed on:	13/03/2018
Your order number:	DS3739	Analysis completed by:	04/04/2018
Report Issue Number:	2	Report issued on:	04/04/2018
Samples Analysed:	19 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924474	924475	924476	924477	924478
Sample Reference				CP101/ES1	CP101/ES2	CP102/ES1	CP102/ES2	DS105/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.35	0.90	0.75	1.00	0.30
Date Sampled				05/03/2018	05/03/2018	05/03/2018	05/03/2018	08/03/2018
Time Taken				PM	PM	PM	PM	AM
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	N/A	NONE	9.2	16
Total mass of sample received				kg	0.001	NONE	2.0	0.61
							2.0	0.54
							0.54	1.6

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	Chrysotile	-	Chrysotile & Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Detected	-	Detected	-	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	< 0.001	-	0.001
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	< 0.001	-	0.001

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	-	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	1.0

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
----------------------------	-------	---	--------	---	---	---	---	---

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.65	-	< 0.05	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	0.46	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	0.62	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	0.57	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.63	-	5.7	-	0.29
Anthracene	mg/kg	0.05	MCERTS	0.15	-	1.5	-	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.6	-	11	-	0.64
Pyrene	mg/kg	0.05	MCERTS	1.6	-	9.3	-	0.61
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.0	-	5.9	-	0.37
Chrysene	mg/kg	0.05	MCERTS	1.2	-	4.8	-	0.39
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.4	-	9.1	-	0.53
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.69	-	1.9	-	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.2	-	6.0	-	0.37
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.57	-	2.8	-	0.24
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	0.93	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.76	-	3.7	-	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	11.3	-	64.0	-	3.68
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	25	-	17	-	19
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8	-	0.5	-	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	0.5	-	2.0
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	< 4.0	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	-	24	-	59
Copper (aqua regia extractable)	mg/kg	1	MCERTS	120	-	51	-	210
Lead (aqua regia extractable)	mg/kg	1	MCERTS	290	-	150	-	270
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	2.8	-	0.8	-	1.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	43	-	24	-	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	210	-	200	-	440



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924474	924475	924476	924477	924478
Sample Reference				CP101/ES1	CP101/ES2	CP102/ES1	CP102/ES2	DS105/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.35	0.90	0.75	1.00	0.30
Date Sampled				05/03/2018	05/03/2018	05/03/2018	05/03/2018	08/03/2018
Time Taken				PM	PM	PM	PM	AM
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	-	29	-	11	160
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	< 0.1
TPH C6 - C40	mg/kg	10	NONE	-	29	-	11	160
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924474	924475	924476	924477	924478
Sample Reference				CP101/ES1	CP101/ES2	CP102/ES1	CP102/ES2	DS105/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.35	0.90	0.75	1.00	0.30
Date Sampled				05/03/2018	05/03/2018	05/03/2018	05/03/2018	08/03/2018
Time Taken				PM	PM	PM	PM	AM
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

VOCs

Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924474	924475	924476	924477	924478
Sample Reference				CP101/ES1	CP101/ES2	CP102/ES1	CP102/ES2	DS105/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.35	0.90	0.75	1.00	0.30
Date Sampled				05/03/2018	05/03/2018	05/03/2018	05/03/2018	08/03/2018
Time Taken				PM	PM	PM	PM	AM
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924474	924475	924476	924477	924478
Sample Reference				CP101/ES1	CP101/ES2	CP102/ES1	CP102/ES2	DS105/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.35	0.90	0.75	1.00	0.30
Date Sampled				05/03/2018	05/03/2018	05/03/2018	05/03/2018	08/03/2018
Time Taken				PM	PM	PM	PM	AM
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 081	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 105	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 114	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 123	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 126	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 156	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 157	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 167	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 169	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 189	mg/kg	0.001	NONE	-	-	-	-	-
Total PCBs	mg/kg	0.012	NONE	-	-	-	-	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924479	924480	924481	924482	924483
Sample Reference				DS105/ES2	DS105/ES3	DS105/ES5	DS106/ES1	DS106/ES2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00-1.20	1.50-1.60	4.50-4.60	0.40-0.50	1.10-1.20
Date Sampled				08/03/2018	08/03/2018	08/03/2018	08/03/2018	08/03/2018
Time Taken				AM	AM	AM	PM	PM
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	9.3	7.5	14	15
Total mass of sample received	kg	0.001	NONE	1.4	0.53	0.57	1.5	0.53

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	Not-detected	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	8.0	8.8	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	200	160	-	-
Total Sulphate as SO ₄	%	0.005	MCERTS	-	0.020	0.016	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.025	0.014	-	-
Total Sulphur	%	0.005	MCERTS	-	0.008	0.006	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	0.1	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	< 1.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	0.25	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	0.46	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	0.37	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-	1.08	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	16	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	2.6	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	25	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	36	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	150	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	27	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	140	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924479	924480	924481	924482	924483
Sample Reference				DS105/ES2	DS105/ES3	DS105/ES5	DS106/ES1	DS106/ES2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00-1.20	1.50-1.60	4.50-4.60	0.40-0.50	1.10-1.20
Date Sampled				08/03/2018	08/03/2018	08/03/2018	08/03/2018	08/03/2018
Time Taken				AM	AM	AM	PM	PM
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	-	-	-	< 1.0	-

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	-	< 10	-	-	< 10
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
TPH C6 - C40	mg/kg	10	NONE	-	< 10	-	-	< 10
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924479	924480	924481	924482	924483
Sample Reference				DS105/ES2	DS105/ES3	DS105/ES5	DS106/ES1	DS106/ES2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00-1.20	1.50-1.60	4.50-4.60	0.40-0.50	1.10-1.20
Date Sampled				08/03/2018	08/03/2018	08/03/2018	08/03/2018	08/03/2018
Time Taken				AM	AM	AM	PM	PM
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Chloroethane	µg/kg	1	NONE	< 1.0	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-	-
Benzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Styrene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Tribromomethane	µg/kg	1	NONE	< 1.0	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924479	924480	924481	924482	924483
Sample Reference				DS105/ES2	DS105/ES3	DS105/ES5	DS106/ES1	DS106/ES2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00-1.20	1.50-1.60	4.50-4.60	0.40-0.50	1.10-1.20
Date Sampled				08/03/2018	08/03/2018	08/03/2018	08/03/2018	08/03/2018
Time Taken				AM	AM	AM	PM	PM
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	0.40	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	0.39	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924479	924480	924481	924482	924483
Sample Reference				DS105/ES2	DS105/ES3	DS105/ES5	DS106/ES1	DS106/ES2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00-1.20	1.50-1.60	4.50-4.60	0.40-0.50	1.10-1.20
Date Sampled				08/03/2018	08/03/2018	08/03/2018	08/03/2018	08/03/2018
Time Taken				AM	AM	AM	PM	PM
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 081	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 105	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 114	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 118	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 123	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 126	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 156	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 157	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 167	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 169	mg/kg	0.001	NONE	-	-	-	< 0.001	-
PCB Congener 189	mg/kg	0.001	NONE	-	-	-	< 0.001	-
Total PCBs	mg/kg	0.012	NONE	-	-	-	< 0.012	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924484	924485	924486	924487	924488
Sample Reference				DS106/ES3	DS102/ES1	DS102/ES2	DS102/ES3	DS103/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	0.40-0.50	0.80-1.00	1.80-2.00	0.40-0.50
Date Sampled				08/03/2018	09/03/2018	09/03/2018	09/03/2018	09/03/2018
Time Taken				PM	AM	AM	AM	PM
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	34	< 0.1	< 0.1	32
Moisture Content	%	N/A	NONE	7.4	2.6	17	5.3	2.4
Total mass of sample received	kg	0.001	NONE	0.50	0.46	1.0	1.5	0.98

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	-	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	< 0.80	-	-	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1.0	-	-	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0	-	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	11	-	-	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	89	-	-	79
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	100	-	-	51
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	15	-	-	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	130	-	-	130



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924484	924485	924486	924487	924488
Sample Reference				DS106/ES3	DS102/ES1	DS102/ES2	DS102/ES3	DS103/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	0.40-0.50	0.80-1.00	1.80-2.00	0.40-0.50
Date Sampled				08/03/2018	09/03/2018	09/03/2018	09/03/2018	09/03/2018
Time Taken				PM	AM	AM	AM	PM
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
o-xylene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10	-	< 10	-
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	-
TPH C6 - C40	mg/kg	10	NONE	< 10	< 10	-	< 10	-
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	33	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	36	-	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	< 10	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	48	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	52	-	< 10



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924484	924485	924486	924487	924488
Sample Reference				DS106/ES3	DS102/ES1	DS102/ES2	DS102/ES3	DS103/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	0.40-0.50	0.80-1.00	1.80-2.00	0.40-0.50
Date Sampled				08/03/2018	09/03/2018	09/03/2018	09/03/2018	09/03/2018
Time Taken				PM	AM	AM	AM	PM
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	-
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Styrene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924484	924485	924486	924487	924488
Sample Reference				DS106/ES3	DS102/ES1	DS102/ES2	DS102/ES3	DS103/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	0.40-0.50	0.80-1.00	1.80-2.00	0.40-0.50
Date Sampled				08/03/2018	09/03/2018	09/03/2018	09/03/2018	09/03/2018
Time Taken				PM	AM	AM	AM	PM
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	0.36	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	0.76	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	0.72	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	0.38	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	0.43	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.59	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.23	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	0.41	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924484	924485	924486	924487	924488
Sample Reference				DS106/ES3	DS102/ES1	DS102/ES2	DS102/ES3	DS103/ES1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	0.40-0.50	0.80-1.00	1.80-2.00	0.40-0.50
Date Sampled				08/03/2018	09/03/2018	09/03/2018	09/03/2018	09/03/2018
Time Taken				PM	AM	AM	AM	PM
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 081	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 105	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 114	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 118	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 123	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 126	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 156	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 157	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 167	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 169	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 189	mg/kg	0.001	NONE	< 0.001	-	-	-	-
Total PCBs	mg/kg	0.012	NONE	< 0.012	-	-	-	-



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924489	924490	924491	924492	
Sample Reference				DS103/ES2	DS104/ES1	DS104/ES2	DS104/ES4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.80-0.90	0.20-0.30	0.60-0.80	3.80-4.00	
Date Sampled				09/03/2018	08/03/2018	08/03/2018	08/03/2018	
Time Taken				PM	PM	PM	PM	
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	16
Moisture Content				%	N/A	NONE	16	19
Total mass of sample received				kg	0.001	NONE	0.85	0.41

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile	-	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Detected	-	
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	0.028	-	
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	0.028	-	

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	-	7.4	
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	-	-	180	
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	0.018	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.022	
Total Sulphur	%	0.005	MCERTS	-	-	-	0.006	
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	5.2	-	-	

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-	-	
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	29	-	
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	2.6	-	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	< 4.0	-	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	43	-	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	320	-	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	430	-	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	8.5	-	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	69	-	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	-	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	480	-	



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924489	924490	924491	924492	
Sample Reference				DS103/ES2	DS104/ES1	DS104/ES2	DS104/ES4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.80-0.90	0.20-0.30	0.60-0.80	3.80-4.00	
Date Sampled				09/03/2018	08/03/2018	08/03/2018	08/03/2018	
Time Taken				PM	PM	PM	PM	
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	11	-	220	-	
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	
TPH C6 - C40	mg/kg	10	NONE	11	-	220	-	
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	-	-	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	-	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	-	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	2.7	-	-	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	31	-	-	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	280	-	-	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	320	-	-	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	-	-	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	-	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	-	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	12	-	-	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	100	-	-	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	110	-	-	



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924489	924490	924491	924492	
Sample Reference				DS103/ES2	DS104/ES1	DS104/ES2	DS104/ES4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.80-0.90	0.20-0.30	0.60-0.80	3.80-4.00	
Date Sampled				09/03/2018	08/03/2018	08/03/2018	08/03/2018	
Time Taken				PM	PM	PM	PM	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	-	
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	-	
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	-	
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Bromodichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	-	
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
p & m-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Styrene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Tri bromomethane	µg/kg	1	NONE	-	-	< 1.0	-	
o-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Isopropylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924489	924490	924491	924492	
Sample Reference				DS103/ES2	DS104/ES1	DS104/ES2	DS104/ES4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.80-0.90	0.20-0.30	0.60-0.80	3.80-4.00	
Date Sampled				09/03/2018	08/03/2018	08/03/2018	08/03/2018	
Time Taken				PM	PM	PM	PM	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	< 0.1	-	
Phenol	mg/kg	0.2	ISO 17025	-	-	< 0.2	-	
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	-	
Isophorone	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	-	
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	-	
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	0.6	-	
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	0.4	-	
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	< 0.3	-	
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
Azobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Phenanthrene	mg/kg	0.05	MCERTS	-	-	3.0	-	
Anthracene	mg/kg	0.05	MCERTS	-	-	0.34	-	
Carbazole	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Anthraquinone	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Fluoranthene	mg/kg	0.05	MCERTS	-	-	3.4	-	
Pyrene	mg/kg	0.05	MCERTS	-	-	2.7	-	
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	< 0.3	-	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	1.5	-	
Chrysene	mg/kg	0.05	MCERTS	-	-	1.6	-	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	2.1	-	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.66	-	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	1.1	-	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	0.68	-	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	0.77	-	



Analytical Report Number: 18-78895

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				924489	924490	924491	924492	
Sample Reference				DS103/ES2	DS104/ES1	DS104/ES2	DS104/ES4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.80-0.90	0.20-0.30	0.60-0.80	3.80-4.00	
Date Sampled				09/03/2018	08/03/2018	08/03/2018	08/03/2018	
Time Taken				PM	PM	PM	PM	
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 081	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 105	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 114	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 118	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 123	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 126	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 156	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 157	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 167	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 169	mg/kg	0.001	NONE	-	-	-	-	
PCB Congener 189	mg/kg	0.001	NONE	-	-	-	-	
Total PCBs	mg/kg	0.012	NONE	-	-	-	-	



Analytical Report Number: 18-78895
Project / Site name: Berols Yard, Tottenham
Your Order No: DS3739

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
924474	CP101/ES1	0.35	141	Loose Fibres	Chrysotile	< 0.001	< 0.001
924476	CP102/ES1	0.75	174	Loose Fibres	Chrysotile	< 0.001	< 0.001
924478	DS105/ES1	0.30	171	Loose Fibres	Chrysotile & Amosite	0.001	0.001
924491	DS104/ES2	0.60-0.80	124	Loose Fibrous Debris	Chrysotile	0.028	0.028

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



Analytical Report Number : 18-78895

Project / Site name: Berols Yard, Tottenham

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
924474	CP101/ES1	None Supplied	0.35	Brown loam and sand with rubble and brick.
924475	CP101/ES2	None Supplied	0.90	Brown clay with gravel.
924476	CP102/ES1	None Supplied	0.75	Brown loam and sand with rubble and brick.
924477	CP102/ES2	None Supplied	1.00	Brown clay and sand with gravel.
924478	DS105/ES1	None Supplied	0.30	Brown clay and sand with rubble.
924479	DS105/ES2	None Supplied	1.00-1.20	Brown clay and sand with rubble.
924480	DS105/ES3	None Supplied	1.50-1.60	Light brown sandy clay with gravel.
924481	DS105/ES5	None Supplied	4.50-4.60	Light brown sand with gravel.
924482	DS106/ES1	None Supplied	0.40-0.50	Brown clay and sand.
924483	DS106/ES2	None Supplied	1.10-1.20	Brown clay and sand.
924484	DS106/ES3	None Supplied	2.50	Light brown gravelly sand.
924485	DS102/ES1	None Supplied	0.40-0.50	Grey gravelly loam with stones.
924486	DS102/ES2	None Supplied	0.80-1.00	Brown clay and sand with gravel.
924487	DS102/ES3	None Supplied	1.80-2.00	Light brown gravelly sand.
924488	DS103/ES1	None Supplied	0.40-0.50	Grey gravelly loam with stones.
924489	DS103/ES2	None Supplied	0.80-0.90	Brown clay and sand.
924490	DS104/ES1	None Supplied	0.20-0.30	Brown loam and clay with gravel and vegetation.
924491	DS104/ES2	None Supplied	0.60-0.80	Brown loam and clay with gravel.
924492	DS104/ES4	None Supplied	3.80-4.00	Light brown sandy gravel with stones. **

**Non MCERTS matrix.

Analytical Report Number : 18-78895

Project / Site name: Berols Yard, Tottenham

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L038	D	MCERTS

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 18-78895

Project / Site name: Berols Yard, Tottenham

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

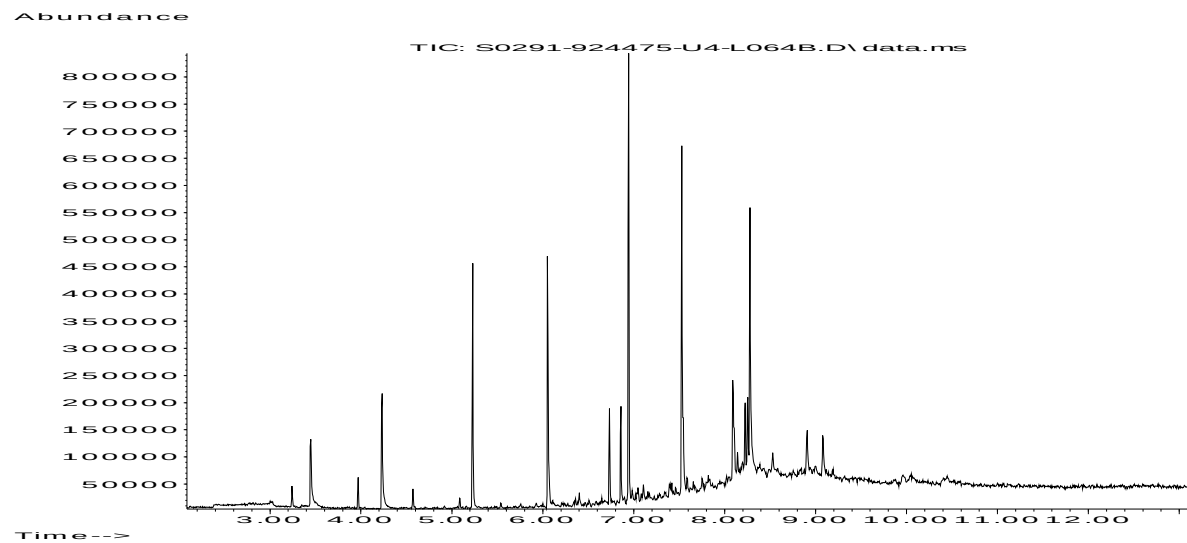
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038	W	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS
TPH C6 - C40 (soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method	L076-PL	W	NONE
TPH Chromatogram	TPH Chromatogram.	In-house method	L064-PL	D	NONE
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

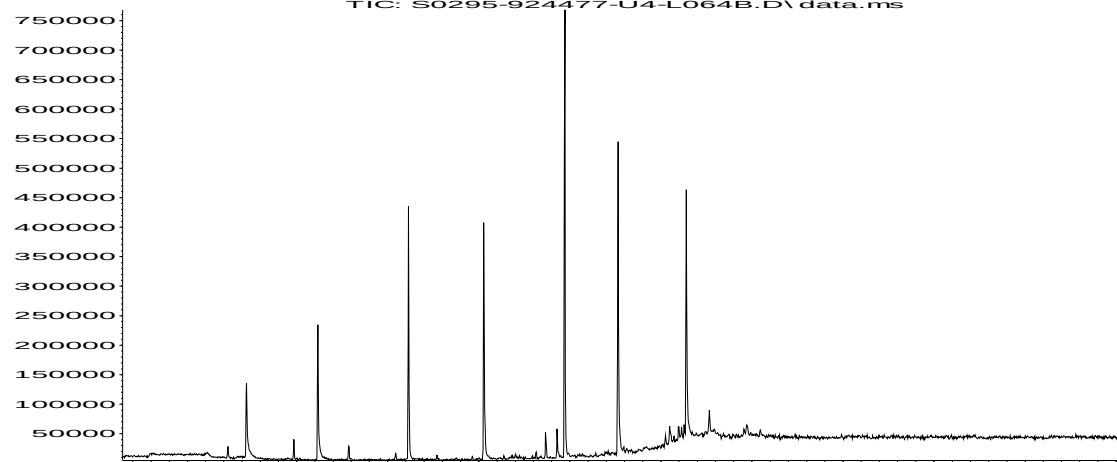
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
DS102/ES3		S	18-78895	924487	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
DS102/ES3		S	18-78895	924487	b	TPH C6 - C40 (soil)	L076-PL	b
DS102/ES3		S	18-78895	924487	b	TPH Chromatogram	L064-PL	b
DS102/ES3		S	18-78895	924487	b	TPH2 (Soil)	L088-PL	b



Abundance

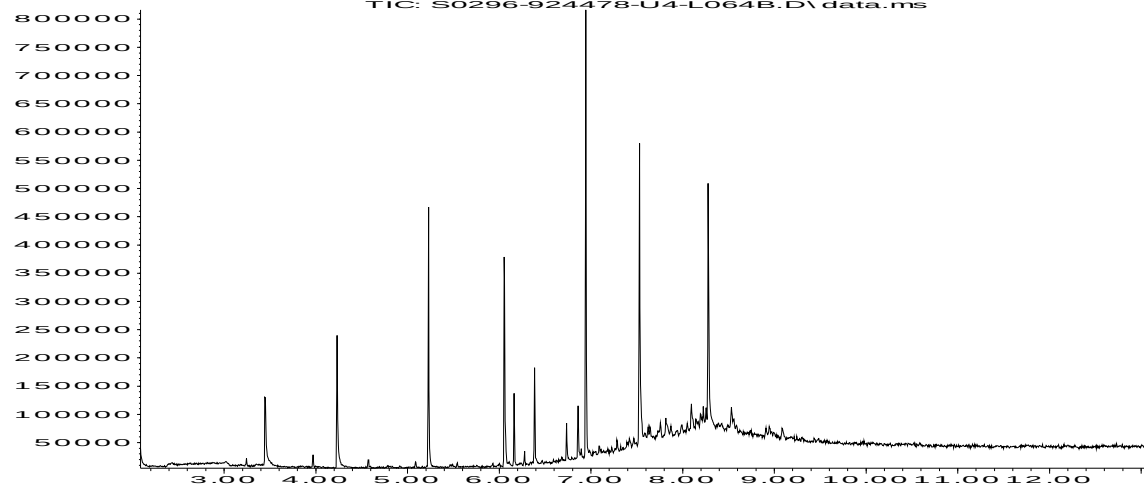
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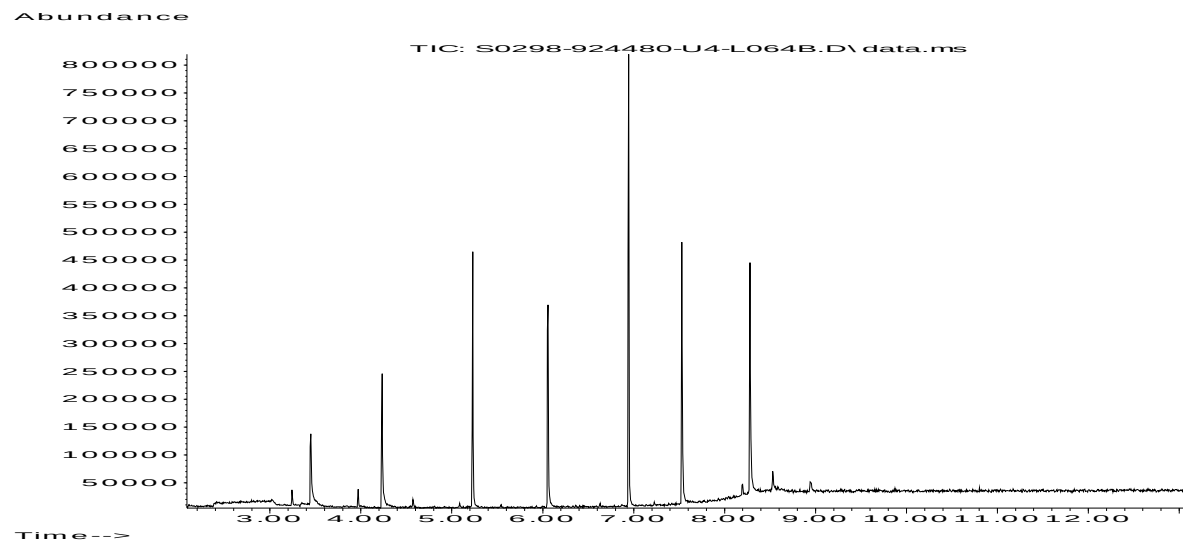
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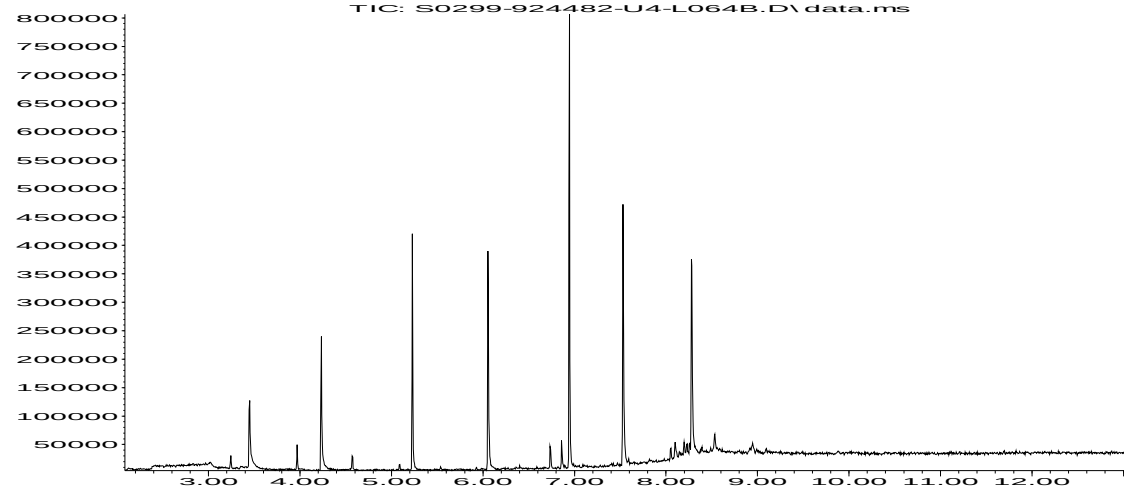


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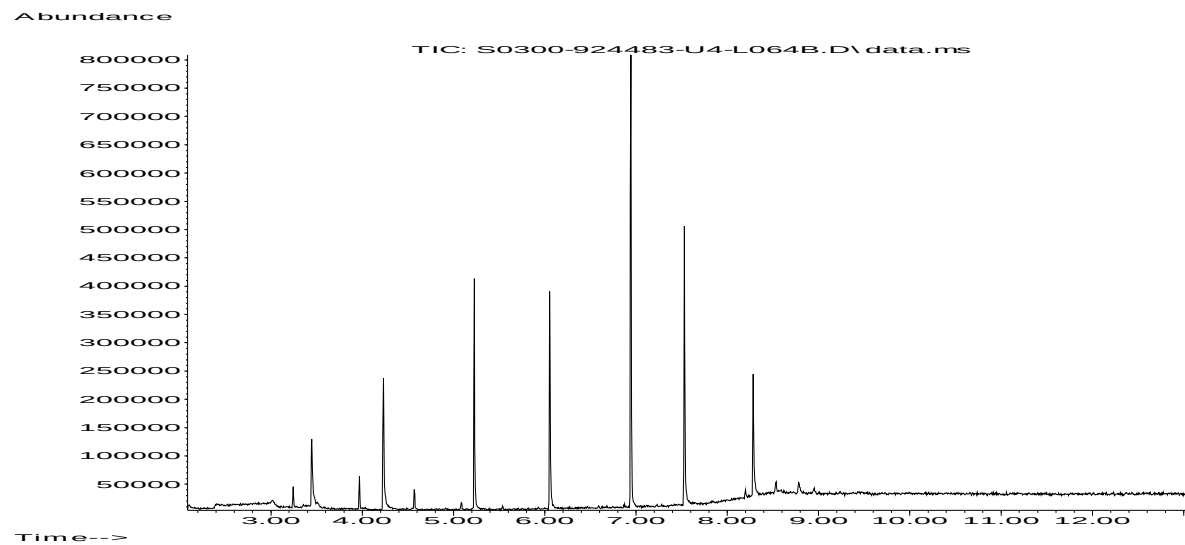


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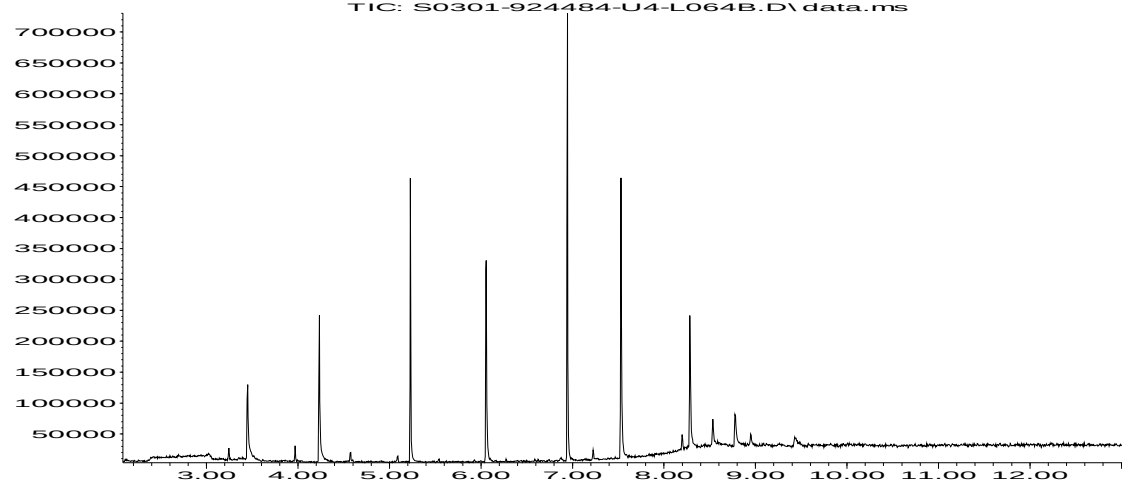


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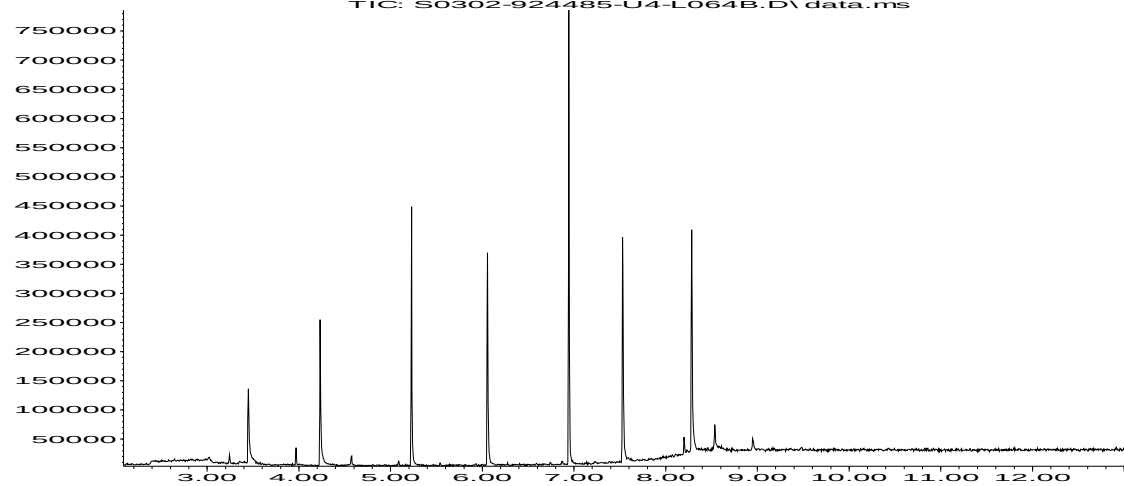
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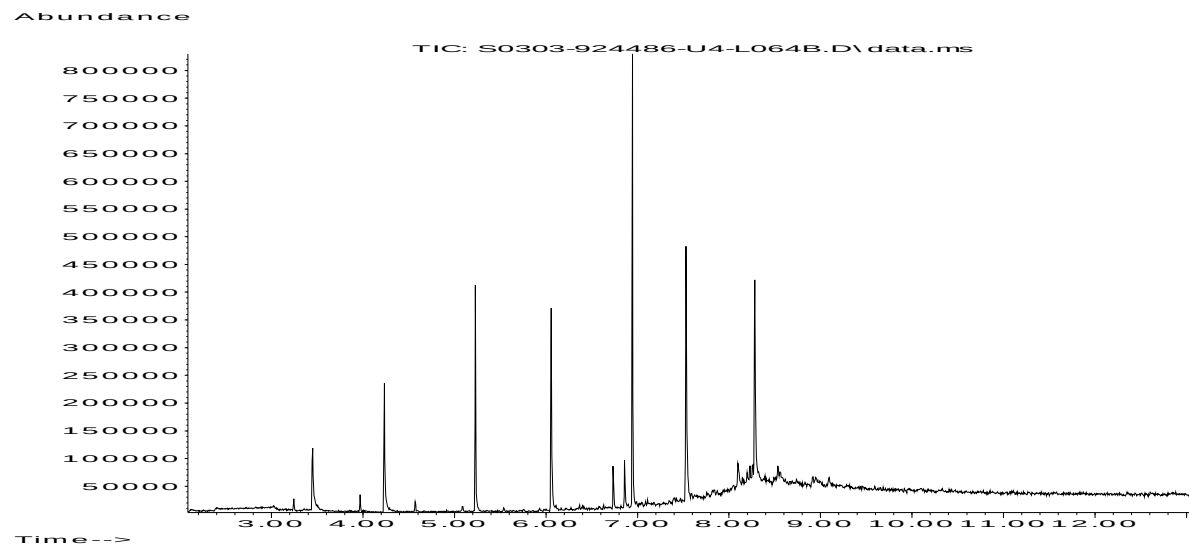
Time-->

Abundance

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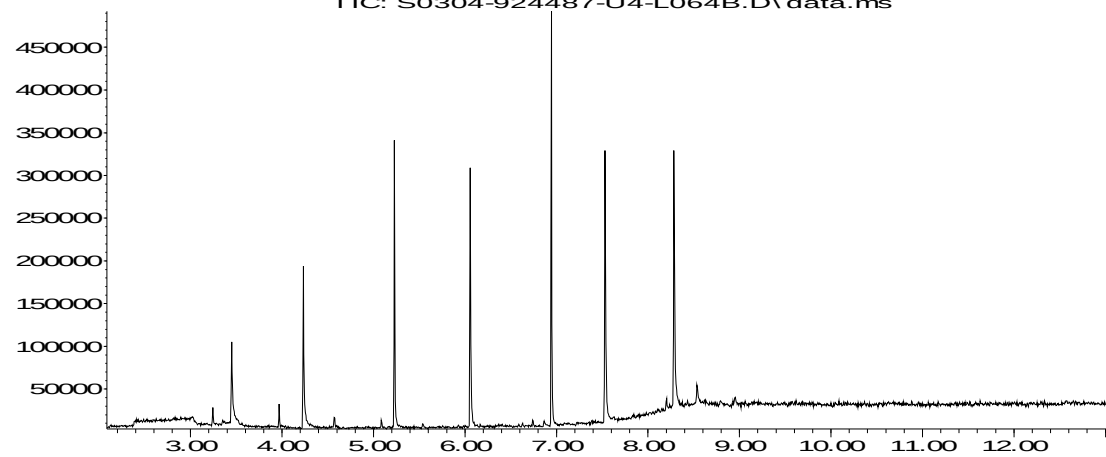


Time-->



Abundance

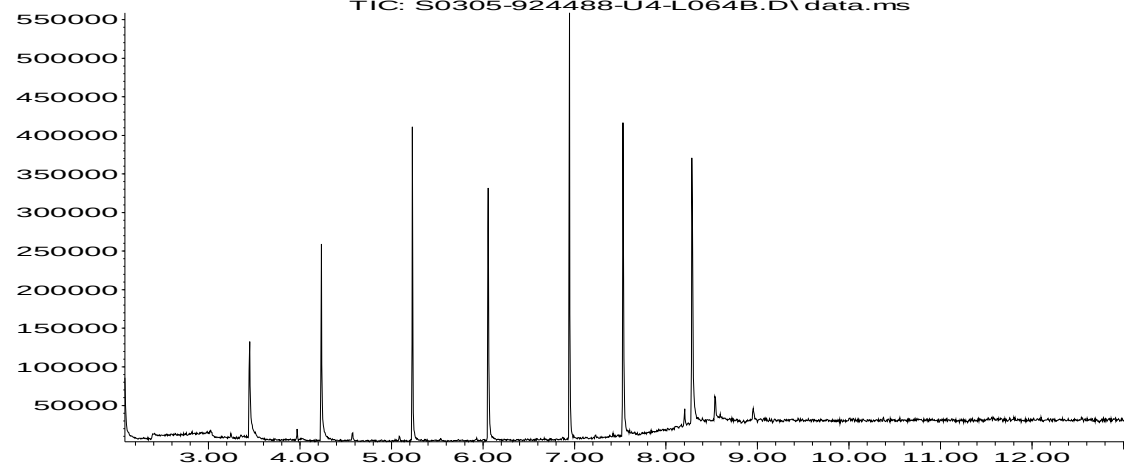
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Time-->

Abundance

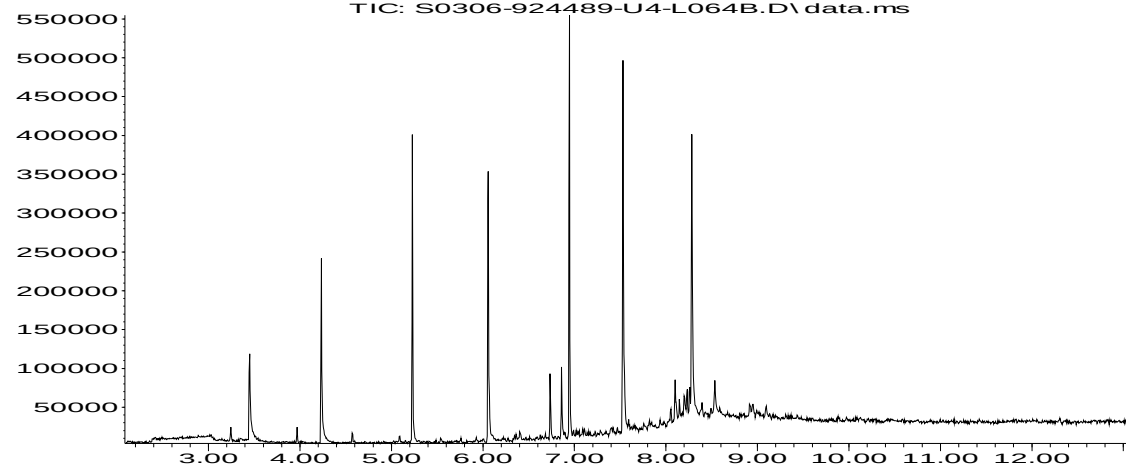
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Time-->

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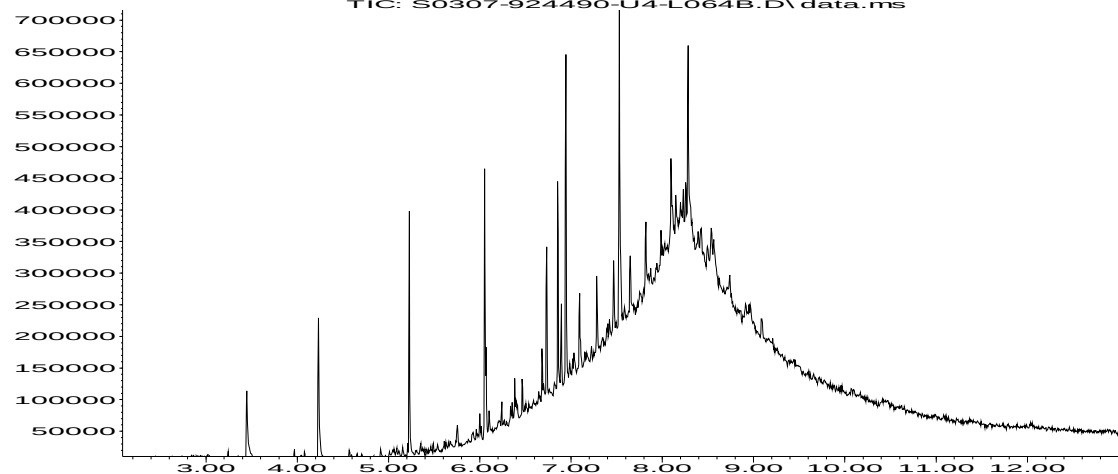
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Time-->

Abundance

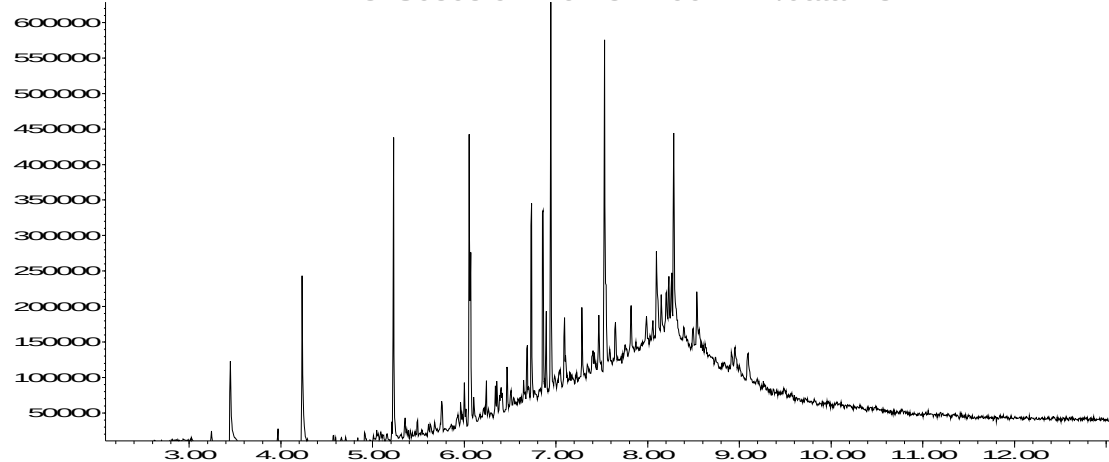
TIC: S0307-924490-U4-L064B.D\data.ms



Time-->

Abundance

TIC: S0308-924491-U4-L064B.D\data.ms



Time-->

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Analytical Report Number : 18-79912

Project / Site name:	Berols Yard, Tottenham	Samples received on:	08/03/2018
Your job number:	18-0192.01	Samples instructed on:	21/03/2018
Your order number:	DS37446	Analysis completed by:	03/04/2018
Report Issue Number:	1	Report issued on:	03/04/2018
Samples Analysed:	4 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-79912

Project / Site name: Berols Yard, Tottenham

Your Order No: DS37446

Lab Sample Number				930602	930603	930604	930605	
Sample Reference				CP102	CP101	CP101	CP101	
Sample Number				9	6	11	14	
Depth (m)				15.38-15.43	3.00	6.00	8.00	
Date Sampled				06/03/2018	06/03/2018	06/03/2018	06/03/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	16	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	13	13	19	21	
Total mass of sample received	kg	0.001	NONE	0.80	2.0	1.2	0.32	

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.5	7.4	8.0	8.0	
Total Sulphate as SO ₄	%	0.005	MCERTS	0.189	0.026	0.078	0.186	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.90	0.036	0.21	0.75	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	901	36.0	210	750	
Total Sulphur	%	0.005	MCERTS	1.39	0.018	0.267	1.41	



Analytical Report Number : 18-79912

Project / Site name: Berols Yard, Tottenham

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
930602	CP102	9	15.38-15.43	Brown clay and sand.
930603	CP101	6	3.00	Light brown sandy gravel with stones. **
930604	CP101	11	6.00	Grey clay and sand.
930605	CP101	14	8.00	Grey clay.

**Non MCERTS matrix.



Analytical Report Number : 18-79912

Project / Site name: Berols Yard, Tottenham

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests"	L038	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

**Kirsten Mills**

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Analytical Report Number : 18-79108

Project / Site name:	Berols Yard, Tottenham	Samples received on:	12/03/2018
Your job number:	18-0192.01	Samples instructed on:	13/03/2018
Your order number:	DS3739	Analysis completed by:	20/03/2018
Report Issue Number:	1	Report issued on:	20/03/2018
Samples Analysed:	3 soil samples		

Signed: 

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-79108

Project / Site name: Berols Yard, Tottenham

Your Order No: DS3739

Lab Sample Number				925707	925708	925709		
Sample Reference				CP102/D3	CP102/D7	CP102/SPT8		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				6.45-6.50	12.29-12.34	19.50-19.95		
Date Sampled				06/03/2018	06/03/2018	06/03/2018		
Time Taken				AM	PM	PM		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	19	17	18		
Total mass of sample received	kg	0.001	NONE	1.2	0.82	0.45		

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4	8.4	8.7		
Total Sulphate as SO ₄	mg/kg	50	MCERTS	680	850	1100		
Total Sulphate as SO ₄	%	0.005	MCERTS	0.068	0.085	0.112		
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.32	0.35	0.54		
Total Sulphur	%	0.005	MCERTS	0.358	0.501	0.710		



Analytical Report Number : 18-79108

Project / Site name: Berols Yard, Tottenham

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
925707	CP102/D3	None Supplied	6.45-6.50	Brown clay.
925708	CP102/D7	None Supplied	12.29-12.34	Brown clay.
925709	CP102/SPT8	None Supplied	19.50-19.95	Brown clay.



Analytical Report Number : 18-79108

Project / Site name: Berols Yard, Tottenham

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests"	L038	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Appendix E – Groundwater Chemical Analysis Results



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Analytical Report Number : 18-80232

Project / Site name:	Berols Yard	Samples received on:	26/03/2018
Your job number:	18-0192.01	Samples instructed on:	26/03/2018
Your order number:		Analysis completed by:	03/04/2018
Report Issue Number:	1	Report issued on:	03/04/2018
Samples Analysed:	9 water samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-80232

Project / Site name: Berols Yard

Lab Sample Number				932414	932415	932416	932417	932418
Sample Reference				DS102	DS103	DS104	DS105	DS106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	2.10	2.50	2.15	2.00
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	8.0	11.7	7.6	8.0	8.1
Sulphate as SO ₄	µg/l	45	ISO 17025	55700	53300	49600	49300	75900
Sulphate as SO ₄	mg/l	0.045	ISO 17025	55.7	53.3	49.6	49.3	75.9

Phenols by GC-MS

Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total Phenols

Total Phenols (GC-MS)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Fluorene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Anthracene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Pyrene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Chrysene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	-	-	< 0.01	-	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	-	-	< 0.16	-	< 0.16
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.98	3.90	6.26	1.55	0.82
Boron (dissolved)	µg/l	10	ISO 17025	57	< 10	130	44	98
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.04	< 0.02	< 0.02	0.13	0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	21	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	14	< 0.2	0.3	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	1.7	50	0.9	18	2.0
Lead (dissolved)	µg/l	0.2	ISO 17025	0.5	0.3	0.5	1.1	0.8
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.3	2.8	6.9	16	15
Selenium (dissolved)	µg/l	0.6	ISO 17025	5.4	8.4	1.0	3.5	1.3
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.5	2.3	5.7	5.6	1.8



Analytical Report Number: 18-80232

Project / Site name: Berols Yard

Lab Sample Number				932414	932415	932416	932417	932418
Sample Reference				DS102	DS103	DS104	DS105	DS106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	2.10	2.50	2.15	2.00
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	-	-	-	-	-
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TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



Analytical Report Number: 18-80232

Project / Site name: Berols Yard

Lab Sample Number				932414	932415	932416	932417	932418
Sample Reference				DS102	DS103	DS104	DS105	DS106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	2.10	2.50	2.15	2.00
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	-	< 1.0	-
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	-	< 1.0	-
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	-	< 1.0	-



Analytical Report Number: 18-80232

Project / Site name: Berols Yard

Lab Sample Number				932414	932415	932416	932417	932418
Sample Reference				DS102	DS103	DS104	DS105	DS106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	2.10	2.50	2.15	2.00
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	-	< 0.05	-
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	-	< 0.01	-



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Project / Site name: Berols Yard

Lab Sample Number				932414	932415	932416	932417	932418
Sample Reference				DS102	DS103	DS104	DS105	DS106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	2.10	2.50	2.15	2.00
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

PCBs by GC-MS

PCB Congener 28	µg/l	0.02	NONE	-	-	-	-	< 0.02
PCB Congener 52	µg/l	0.02	NONE	-	-	-	-	< 0.02
PCB Congener 101	µg/l	0.02	NONE	-	-	-	-	< 0.02
PCB Congener 118	µg/l	0.02	NONE	-	-	-	-	< 0.02
PCB Congener 138	µg/l	0.02	NONE	-	-	-	-	< 0.02
PCB Congener 153	µg/l	0.02	NONE	-	-	-	-	< 0.02
PCB Congener 180	µg/l	0.02	NONE	-	-	-	-	< 0.02

PCBs by GC-MS

Total PCBs	µg/l	0.14	NONE	-	-	-	-	< 0.14
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 18-80232

Project / Site name: Berols Yard

Lab Sample Number				932419	932420	932421	932422	
Sample Reference				CP102	WS05	BH1	BH2	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				10.00	2.10	30.00	11.00	
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	7.6	7.6	7.5	7.6	
Sulphate as SO ₄	µg/l	45	ISO 17025	89300	93500	113000	162000	
Sulphate as SO ₄	mg/l	0.045	ISO 17025	89.3	93.5	113	162	

Phenols by GC-MS

Phenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2,4,5-Trichlorophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2,4,6-Trichlorophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2,4-Dichlorophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2,4-Dimethylphenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2-Chlorophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2-Methylphenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2-Nitrophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
4-Chloro-3-methylphenol	µg/l	0.05	NONE	-	< 0.05	-	-	
4-Methylphenol	µg/l	0.05	NONE	-	< 0.05	-	-	

Total Phenols

Total Phenols (GC-MS)	µg/l	1	NONE	-	< 1.0	-	-	
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	-	-	-	-	
Acenaphthylene	µg/l	0.01	ISO 17025	-	-	-	-	
Acenaphthene	µg/l	0.01	ISO 17025	-	-	-	-	
Fluorene	µg/l	0.01	ISO 17025	-	-	-	-	
Phenanthrene	µg/l	0.01	ISO 17025	-	-	-	-	
Anthracene	µg/l	0.01	ISO 17025	-	-	-	-	
Fluoranthene	µg/l	0.01	ISO 17025	-	-	-	-	
Pyrene	µg/l	0.01	ISO 17025	-	-	-	-	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	-	-	-	-	
Chrysene	µg/l	0.01	ISO 17025	-	-	-	-	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	-	-	-	-	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	-	-	-	-	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	-	-	-	-	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	-	-	-	-	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	-	-	-	-	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	-	-	-	-	

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	-	-	-	-	
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	0.15	ISO 17025	-	0.27	-	-	
Boron (dissolved)	µg/l	10	ISO 17025	-	90	-	-	
Cadmium (dissolved)	µg/l	0.02	ISO 17025	-	0.05	-	-	
Chromium (hexavalent)	µg/l	5	ISO 17025	-	< 5.0	-	-	
Chromium (dissolved)	µg/l	0.2	ISO 17025	-	< 0.2	-	-	
Copper (dissolved)	µg/l	0.5	ISO 17025	-	3.0	-	-	
Lead (dissolved)	µg/l	0.2	ISO 17025	-	1.1	-	-	
Mercury (dissolved)	µg/l	0.05	ISO 17025	-	< 0.05	-	-	
Nickel (dissolved)	µg/l	0.5	ISO 17025	-	4.3	-	-	
Selenium (dissolved)	µg/l	0.6	ISO 17025	-	1.1	-	-	
Zinc (dissolved)	µg/l	0.5	ISO 17025	-	4.1	-	-	



Analytical Report Number: 18-80232

Project / Site name: Berols Yard

Lab Sample Number				932419	932420	932421	932422	
Sample Reference				CP102	WS05	BH1	BH2	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				10.00	2.10	30.00	11.00	
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Toluene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Ethylbenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
p & m-xylene	µg/l	1	ISO 17025	-	< 1.0	-	-	
o-xylene	µg/l	1	ISO 17025	-	< 1.0	-	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	-	< 1.0	-	-	

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	-	< 10	< 10	
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TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	-	< 1.0	-	-	
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	-	< 1.0	-	-	
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	-	< 1.0	-	-	
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	-	< 10	-	-	
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	-	< 10	-	-	
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	-	< 10	-	-	
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	-	< 10	-	-	
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	-	< 10	-	-	

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	-	< 1.0	-	-	
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	-	< 1.0	-	-	
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	-	< 1.0	-	-	
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	-	< 10	-	-	
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	-	< 10	-	-	
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	-	< 10	-	-	
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	-	< 10	-	-	
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	-	< 10	-	-	



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Project / Site name: Berols Yard

Lab Sample Number				932419	932420	932421	932422	
Sample Reference				CP102	WS05	BH1	BH2	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				10.00	2.10	30.00	11.00	
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Chloroethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Bromomethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Vinyl Chloride	µg/l	1	NONE	-	< 1.0	-	-	
Trichlorofluoromethane	µg/l	1	NONE	-	< 1.0	-	-	
1,1-Dichloroethene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	-	< 1.0	-	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,1-Dichloroethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
2,2-Dichloropropane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Trichloromethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,1,1-Trichloroethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,2-Dichloroethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,1-Dichloropropene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Benzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Tetrachloromethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,2-Dichloropropane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Trichloroethene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Dibromomethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Bromodichloromethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Toluene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,1,2-Trichloroethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,3-Dichloropropane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Dibromochloromethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Tetrachloroethene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,2-Dibromoethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Chlorobenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Ethylbenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
p & m-Xylene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Styrene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Tribromomethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
o-Xylene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	-	< 1.0	-	-	
Isopropylbenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Bromobenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
n-Propylbenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
2-Chlorotoluene	µg/l	1	ISO 17025	-	< 1.0	-	-	
4-Chlorotoluene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
tert-Butylbenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
sec-Butylbenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,3-Dichlorobenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
p-Isopropyltoluene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,2-Dichlorobenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,4-Dichlorobenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Butylbenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	
Hexachlorobutadiene	µg/l	1	ISO 17025	-	< 1.0	-	-	
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	-	< 1.0	-	-	



Analytical Report Number: 18-80232

Project / Site name: Berols Yard

Lab Sample Number				932419	932420	932421	932422	
Sample Reference				CP102	WS05	BH1	BH2	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				10.00	2.10	30.00	11.00	
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	µg/l	0.05	NONE	-	< 0.05	-	-	
Phenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2-Chlorophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	-	< 0.05	-	-	
1,3-Dichlorobenzene	µg/l	0.05	NONE	-	< 0.05	-	-	
1,2-Dichlorobenzene	µg/l	0.05	NONE	-	< 0.05	-	-	
1,4-Dichlorobenzene	µg/l	0.05	NONE	-	< 0.05	-	-	
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	-	< 0.05	-	-	
2-Methylphenol	µg/l	0.05	NONE	-	< 0.05	-	-	
Hexachloroethane	µg/l	0.05	NONE	-	< 0.05	-	-	
Nitrobenzene	µg/l	0.05	NONE	-	< 0.05	-	-	
4-Methylphenol	µg/l	0.05	NONE	-	< 0.05	-	-	
Isophorone	µg/l	0.05	NONE	-	< 0.05	-	-	
2-Nitrophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2,4-Dimethylphenol	µg/l	0.05	NONE	-	< 0.05	-	-	
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	-	< 0.05	-	-	
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	-	< 0.05	-	-	
Naphthalene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
2,4-Dichlorophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
4-Chloroaniline	µg/l	0.05	NONE	-	< 0.05	-	-	
Hexachlorobutadiene	µg/l	0.05	NONE	-	< 0.05	-	-	
4-Chloro-3-methylphenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2,4,6-Trichlorophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2,4,5-Trichlorophenol	µg/l	0.05	NONE	-	< 0.05	-	-	
2-Methylnaphthalene	µg/l	0.05	NONE	-	< 0.05	-	-	
2-Chloronaphthalene	µg/l	0.05	NONE	-	< 0.05	-	-	
Dimethylphthalate	µg/l	0.05	NONE	-	< 0.05	-	-	
2,6-Dinitrotoluene	µg/l	0.05	NONE	-	< 0.05	-	-	
Acenaphthylene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Acenaphthene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
2,4-Dinitrotoluene	µg/l	0.05	NONE	-	< 0.05	-	-	
Dibenzofuran	µg/l	0.05	NONE	-	< 0.05	-	-	
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	-	< 0.05	-	-	
Diethyl phthalate	µg/l	0.05	NONE	-	< 0.05	-	-	
4-Nitroaniline	µg/l	0.05	NONE	-	< 0.05	-	-	
Fluorene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Azobenzene	µg/l	0.05	NONE	-	< 0.05	-	-	
Bromophenyl phenyl ether	µg/l	0.05	NONE	-	< 0.05	-	-	
Hexachlorobenzene	µg/l	0.05	NONE	-	< 0.05	-	-	
Phenanthrene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Anthracene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Carbazole	µg/l	0.05	NONE	-	< 0.05	-	-	
Dibutyl phthalate	µg/l	0.05	NONE	-	< 0.05	-	-	
Anthraquinone	µg/l	0.05	NONE	-	< 0.05	-	-	
Fluoranthene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Pyrene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Butyl benzyl phthalate	µg/l	0.05	NONE	-	< 0.05	-	-	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Chrysene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	-	< 0.01	-	-	



Analytical Report Number: 18-80232

Project / Site name: Berols Yard

Lab Sample Number				932419	932420	932421	932422	
Sample Reference				CP102	WS05	BH1	BH2	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				10.00	2.10	30.00	11.00	
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

PCBs by GC-MS

PCB Congener 28	µg/l	0.02	NONE	-	-	-	-	
PCB Congener 52	µg/l	0.02	NONE	-	-	-	-	
PCB Congener 101	µg/l	0.02	NONE	-	-	-	-	
PCB Congener 118	µg/l	0.02	NONE	-	-	-	-	
PCB Congener 138	µg/l	0.02	NONE	-	-	-	-	
PCB Congener 153	µg/l	0.02	NONE	-	-	-	-	
PCB Congener 180	µg/l	0.02	NONE	-	-	-	-	

PCBs by GC-MS

Total PCBs	µg/l	0.14	NONE	-	-	-	-	
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 18-80232

Project / Site name: Berols Yard

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
PCB's By GC-MS in water	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L028-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Phenols, speciated, in water, by GCMS	Determination of speciated phenols in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
TPH Chromatogram	TPH Chromatogram.	In-house method	L070-PL	W	NONE
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

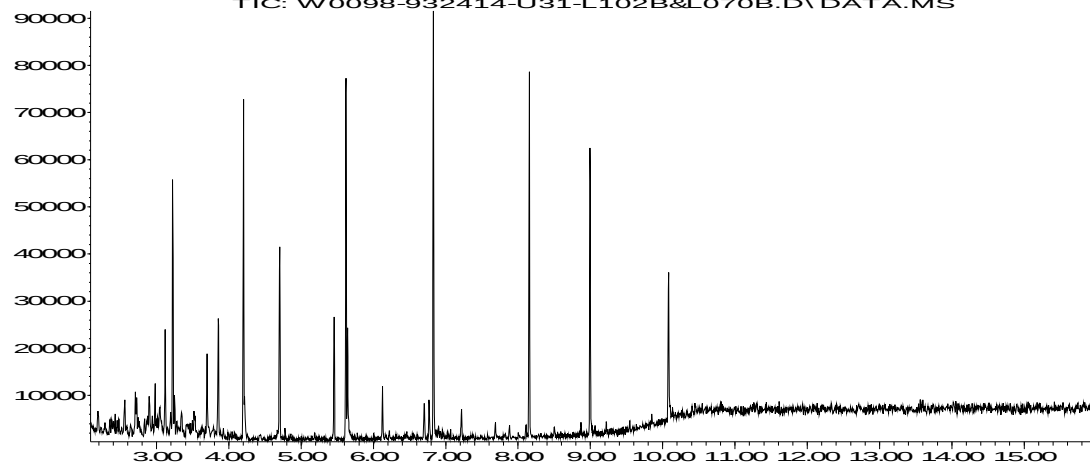
Sample Deviation Report



Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH1		W	18-80232	932421	c	pH at 20oC in water (automated)	L099-PL	c
BH2		W	18-80232	932422	c	pH at 20oC in water (automated)	L099-PL	c
CP102		W	18-80232	932419	c	pH at 20oC in water (automated)	L099-PL	c
DS102		W	18-80232	932414	c	pH at 20oC in water (automated)	L099-PL	c
DS103		W	18-80232	932415	c	pH at 20oC in water (automated)	L099-PL	c
DS104		W	18-80232	932416	c	pH at 20oC in water (automated)	L099-PL	c
DS105		W	18-80232	932417	c	pH at 20oC in water (automated)	L099-PL	c
DS106		W	18-80232	932418	c	pH at 20oC in water (automated)	L099-PL	c
WS05		W	18-80232	932420	c	pH at 20oC in water (automated)	L099-PL	c

Abundance

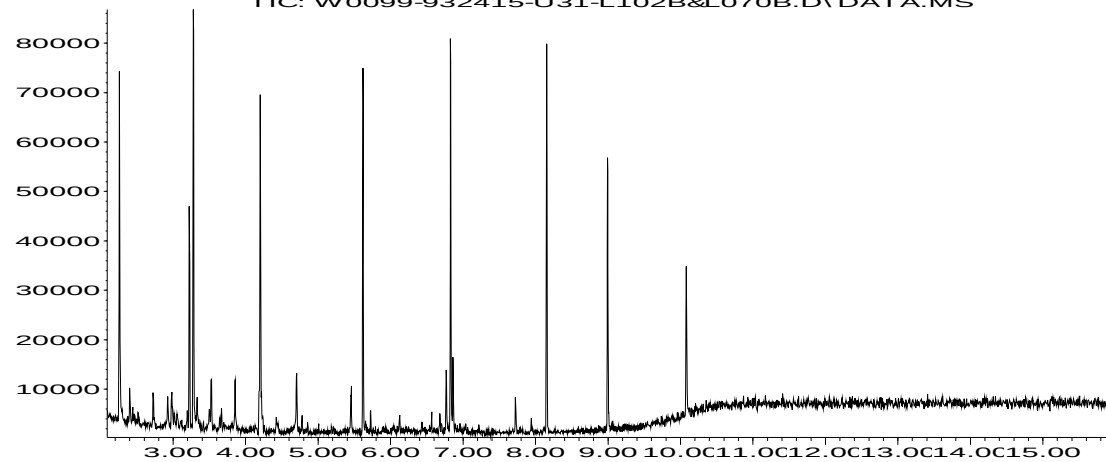
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Time-->

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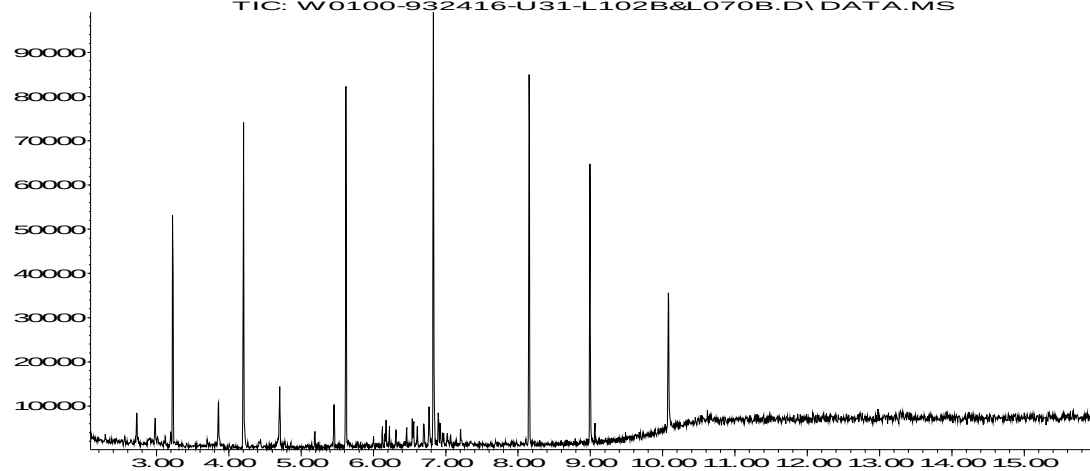
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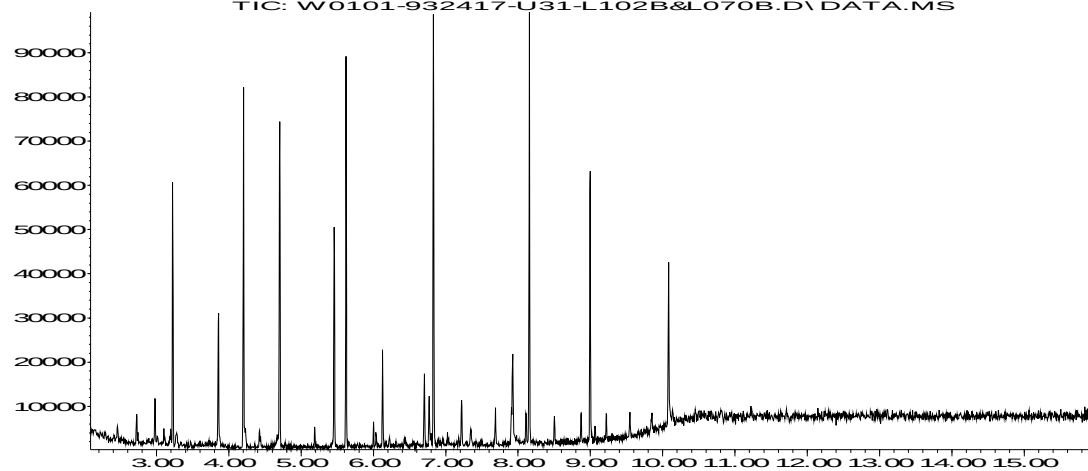
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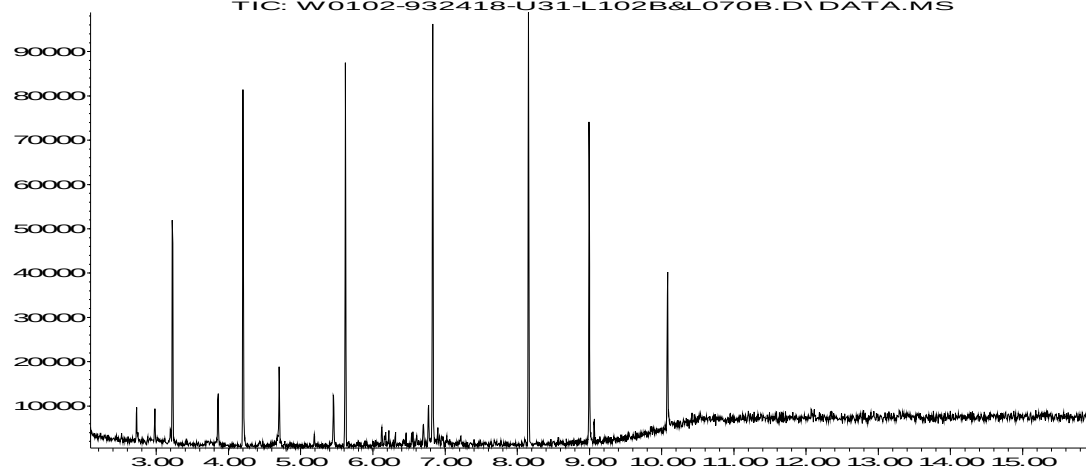
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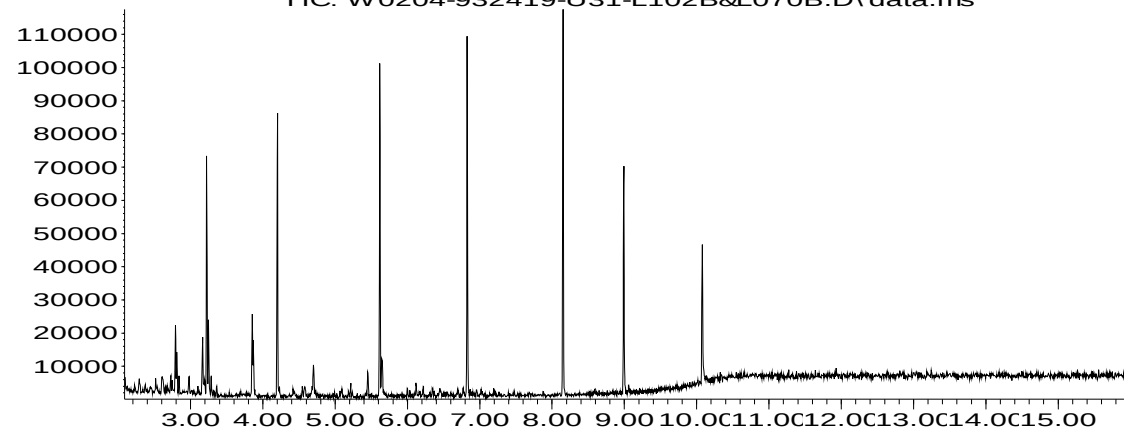
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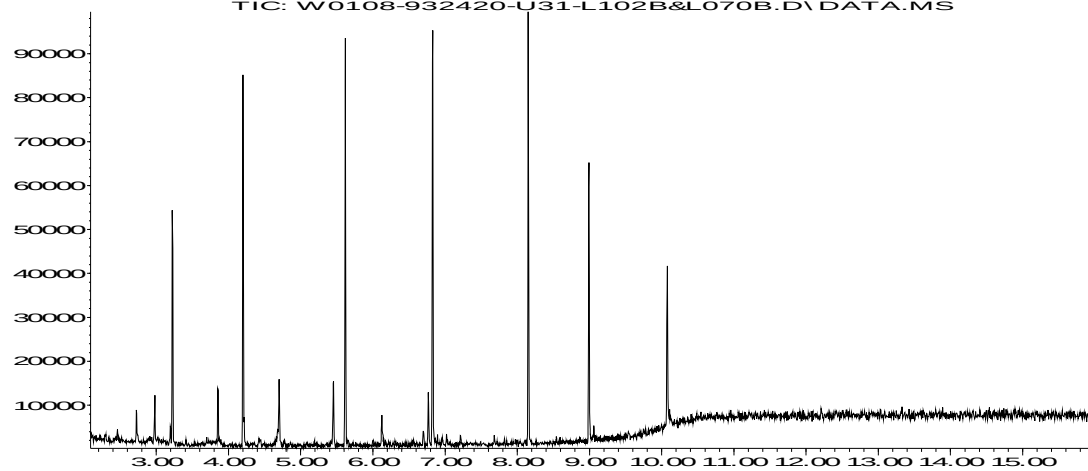
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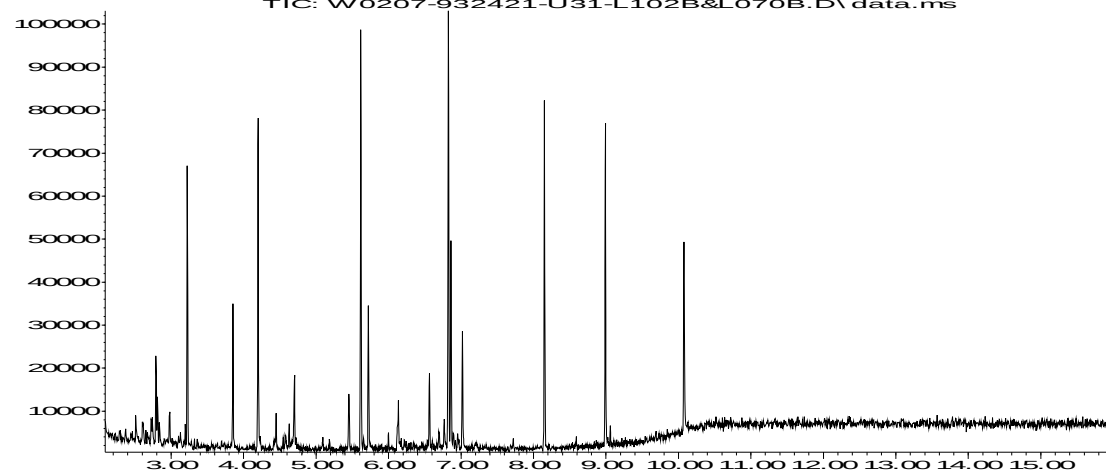
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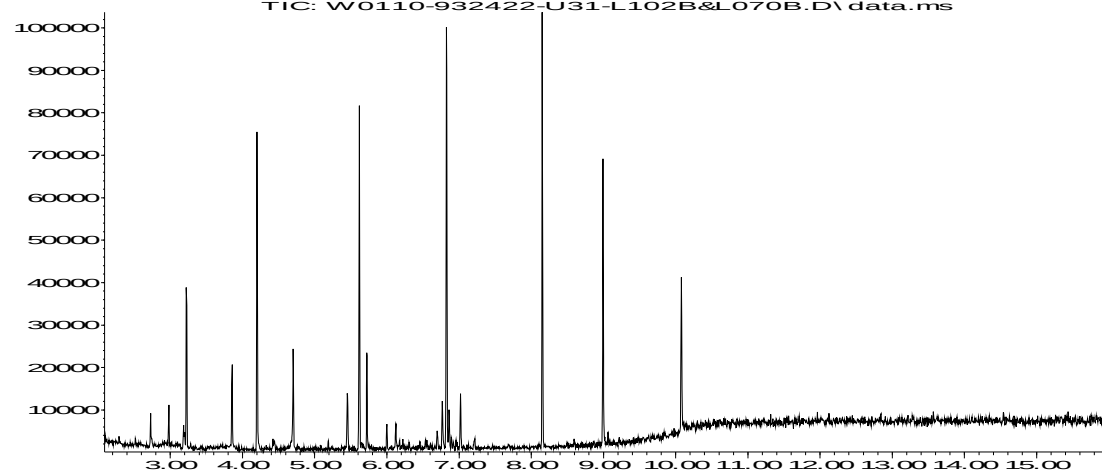
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Time-->

Abundance

TIC: W0110-932422-U31-L102B&L070B.D\data.ms



Time-->

Appendix F – Field Monitoring Data/Gas Monitoring Data

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**Appendix 7 Archaeology report submitted
for application ref.
HGY/2017/2044**

Berol Yard, Ashley Road, Tottenham Hale, London Borough of Haringey: A Written Scheme of Investigation for a Historic Building Record

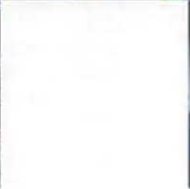
Planning Application: HGY/2017/2044

National Grid Reference Number: TQ 34415 89703

AOC Project No: 33650

Site Code: TBC

Date: June 2018



AOC
Archaeology
Group



ARCHAEOLOGY

HERITAGE

CONSERVATION

Berol Yard, Ashley Road, Tottenham Hale, London Borough of Haringey:

A Written Scheme of Investigation for a Historic Building Record

On Behalf of:	Berkeley Square Developments Tottenham Hale Limited 42 – 44 Bishopgate London EC2N 4AH
National Grid Reference (NGR):	TQ 34415 89703
Planning Application No:	HGY/2017/2044
AOC Project No:	33650
Prepared by:	Diana Sproat & Thomas Bradley-Lovekin
Illustration by:	Sam O'Leary
Date:	June 2018

This document has been prepared in accordance with AOC standard operating procedures.

Author: Diana Sproat / Thomas Bradley-Lovekin Date: June 2018

Approved by: Catherine Edwards Date: June 2018

Draft Report Stage: Draft Date: June 2018

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Illustrations

Figure 1 – Site Location

Figure 2 – Detailed Site Location

Figure 3 – Development Proposal

1. Introduction

- 1.1 This document is a Written Scheme of Investigation (WSI) setting out a methodology for a historic building record to be undertaken on buildings to be affected by development at Berol Yard, Ashley Road, Tottenham Hale, London (NGR TQ 34415 89703) (Figure 1).
- 1.2 The London Borough of Haringey (Haringey Council) has recently granted planning approval for a mixed-use development at Berol Yard, Tottenham Hale (Planning Ref: HGY/2017/2044). The consented scheme will require the demolition of all the existing buildings on site with the exception of Berol House. Although none of the buildings on the site have been statutorily Listed at the national level, although Berol House (Building 2), a former pencil factory, has been locally listed by Haringey Council. The building numbers referred to in this WSI are those which are used in paragraph H3.11 of the Environmental Statement (Nathaniel Litchfield and Partners 2016, 14) and the buildings are located on Figure 2 of this WSI.
- 1.3 The development is part of an application for full planning permission for the demolition of the existing buildings within the Berol Yard site and retention of Berol House. Erection of two buildings between 8 and 14 storeys providing 166 residential units, 694sqm (GEA) of commercial floorspace (Class A1/A3/B1), 7,275sqm (GEA) of education floorspace (Class D1), car and cycle parking, open space, landscaping and other associated works.
- 1.4 This WSI details how the historic building record will be undertaken. The works will comprise the recording of the structures by a photographic, drawn and written record to Level 3 for Berol House, and Level 2 for 1 Berol Yard, as defined by English Heritage guidelines (English Heritage 2016).

2. Planning Background

- 2.1 The local planning authority is Haringey Council. Archaeological advice to the council is provided by Adam Single, Archaeological Advisor to the Greater London Archaeological Advisory Service (GLAAS).
- 2.2 The proposal for development will result in the refurbishment of the locally listed Berol House. The planning application was, therefore, granted with an archaeological condition for an historic building record to protect the special architectural or historic interest of the building to the east of the site. The condition states that:

'Excluding works relating to the College, no demolition or development shall take place until a written scheme of investigation WSI has been submitted to and approved by the local planning authority in writing. For land that is included within the WSI, no demolition or development shall take place other than in accordance with the agreed WSI, which shall include the statement of significance and research objectives, and:

- a. The programme and methodology of site investigation and recording and the nomination of a competent person(s) or organisation to undertake the agreed works.
- b. The programme for post investigation assessment
- c. Provision to be made for analysis of the site investigation and recording.
- d. Provision to be made for publication and dissemination of the analysis and records of the site investigation.
- e. Provision to be made for archive deposition of the analysis and records of the site investigation.

- f. Nomination of a competent person or persons/organisation to undertake the works set out in the Written Scheme of Investigation'
 - g. The site investigation shall be completed prior to development, or in such other phased arrangement, as agreed and approved in writing by the Local Planning Authority.
- 2.3 Excluding the College, no development shall take place within the area indicated until the implementation of a programme of archaeological work has been secured, in accordance with a Written Scheme of Investigation that has been submitted to and approved in writing by the Local Planning Authority (Haringey Council, Committee Report 28/11/2017, Part 7).
- 2.4 This WSI details the methods and standards to which the historic building record will be undertaken and has been designed in accordance with current best archaeological practice and local and national standards and guidelines:
- Department for Communities and Local Government – National Planning Policy Framework (NPPF) (DCLG 2012).
 - Historic England – Management of Archaeological Projects (HE 2015).
 - Historic England – Understanding Historic Buildings: A Guide to Good Recording Practice (EH 2016).
 - Chartered Institute for Archaeologists – Standards and Guidance for Archaeological Investigation and Recording of Standing Buildings and Structures (CIfA 2014).
 - Chartered Institute for Archaeologists – Code of Conduct (CIfA 2010).

3. Archaeological and Historical Background

- 3.1 Tottenham is an Anglo-Saxon settlement with occupation centred on the former Roman road from London to York which ran through it (Nathanial Lichfield *et al* 2016). However, Tottenham was still a very rural area until the late 18th century and early 19th century. The earliest detailed Ordnance Survey map of the area, the First Edition Six Inch to the Mile of 1863-9 (Middlesex Sheet XII), shows the site undeveloped and split between open fields. However, the Great Eastern Railway had been built to the west by this time and Tottenham Hale Station built to the south. A small settlement is shown to the south of the site focussed on the Hale, its irregular layout suggesting that it had originated as a pre-industrial hamlet. A farm, Hale Farm is shown to the immediate west of the masterplan area and it is assumed that the fields that are shown on the site were associated with this farm.
- 3.2 The site continues to be shown undeveloped on the 25 Inch to the Mile of 1894 (London III.NE, published 1896) although development had extended to the immediate south by that date, with the southern part of Ashley Road shown extending northwards towards the as yet undeveloped site. Ashley Road had been extended northwards across the site by the time that the subsequent 25 Inch was surveyed in 1911-12 (Essex New Series 1913- n LXXVII.7, published 1915). Three factories are shown on Ashley Road; the pencil factory on its eastern side and a woollen factory and a braid and bootlace factory on its western side. The surviving element of the pencil factory (Berol House, Building 9) is shown extending along the eastern frontage of Ashley Road, whilst the woollen factory occupies the footprint that is now occupied by the Cannon Street Jersey Fabric Works. Both Berol House and the Cannon Street Jersey Fabric Works appear architecturally to be either late Victorian or Edwardian and the historic map evidence suggests that they were built between 1894 and 1911-12. Stylistically the Jersey Fabric Works could potentially predate Berol House.
- 3.3 The Pencil Factory (Building 9) had been expanded by the time that the 25 Inch was revised in 1936 (Essex New Series 1913- n LXXVII.7, published 1939), although the footprint of the Cannon Avent

Factory (Building 11) to the north continues to be shown clear of buildings. Both the woollen factory and the braid and bootlace factory on the western side of Ashley Road had closed by this time; the former woollen factory (now the Jersey Fabric Works, Building 12) was recorded as a 'Dry Battery Factory' in 1936, whilst the former braid and bootlace factory had been converted into a 'Printing Ink & Varnish' works.

- 3.4 The Pencil Factory (Building 9), was built for the Eagle Pencil Company which was established in New York by German immigrants in 1859. The company opened a London office in 1864 and by 1900 expansion required a new factory and it is assumed that these are the premises which survive on Ashley Road (Grace's Guide, online source). The company was sold to the Berol Corporation in 1969 and the business relocated to Kings Lynn in 1978.

4. Aims and Objectives

- 4.1 The aims of the historic building record are:
- To determine the buildings' development and use.
 - To provide a written account of the buildings form, function, date and sequence of development.
 - To photograph the exterior and interior of the building to create a permanent archive record.
 - To provide a descriptive account and interpretation of the building.
- 4.2 The final aim is to make public the results of the investigation, subject to any confidentiality restrictions.

5. Scope of Works and Strategy

- 5.1 Prior to any development works, recording will be carried out on Berol House (Building 9) in line with a 'Level 3' survey as defined by Historic England guidelines (HE 2016). It is also proposed to undertake a 'Level 2' recording of No. 1 Berol Yard (a single storey building to the east of Berol House). This scheme of works will comprise the analysis and descriptive interpretation of the building, including the history, character, date, techniques of construction, phasing and significance of the structure. The applicant or successor in title must ensure that all debris, stored material, vehicles and excessive obscuring vegetation are removed before the commencement of the historic building record. This includes all accessible internal spaces and land immediately surrounding the building being recorded. Work will commence before any external hoarding or coverings have been put in place and prior to any soft stripping works.
- 5.2 Recording and reporting will conform with current best archaeological practice and local and national standards and guidelines:
- Historic England – Archaeological Guidance Paper 3: Standards and Practices in Archaeological Fieldwork (HE 2015a)
 - Historic England – Management of Archaeological Projects (HE 2015b).
 - Historic England (2015c). Understanding Historic Buildings: a guide to good recording practice
 - Chartered Institute for Archaeologists – Code of Conduct (CIfA 2014).
 - Museum of London – Archaeological Site Manual (Third Edition) (MoL 1994).
 - RESCUE & ICON – First Aid for Finds (RESCUE & ICON 2001).
- 5.3 Insurances, copyright and confidentiality, and standards are defined in Appendix A.
- 5.4 The HER/accession number will be assigned by the Greater London Archaeological Advisory Service and will be used as the site identifier for all records produced.