Phase II Geoenvironmental Site Assessment

Site: Riverpark Road, Manchester
Reference: 17-246-R2-5
Date: March 25



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EXECUTIVE SUMMARY

Site Address	Riverpark Road, Manchester, M40 2XP
Grid Reference	E 387308, N 399470
Site Area	7.43 Ha
Proposed Development	Kellen Homes intends to create a new community on a sustainably located site in East Manchester, delivering new family housing and affordable homes. The proposed residential development will comprise a total of 221 low rise residential dwellings and 277 apartments across five buildings ranging from 4 to 6 storeys in height with associated gardens, estate roads and infrastructure.
Current Site Use	At the time of the walkover in February 2024 the subject site was an irregularly shaped parcel of land located to the northeast of Manchester city centre, occupied by a former meat processing and wholesale ring and industrial/commercial warehouse units. Various occupancies and site uses were noted during the walkover, including HGV parking facility, butchery, drain clearance, self-storage facility, mechanical and electrical warehouse(s) and an outdoor furniture warehouse. At the time of the walkover in February 2024 , six structures were present, including an office block in the west, former livestock building (west) and warehouses in the east. Structures largely comprise of brick and concrete. The central self-store warehouse and eastern warehouse are steel clad, portal frame structures. A communication tower is present atop a concrete pillar located immediately adjacent north of the centre of the self-store building. As of March 2025, the buildings are currently being demolished. It would appear that the ground level of the former livestock building (central building) was historically partially open to allow ventilation. However, observations suggest that since the cessation of livestock processing, a breeze block has been used to infill and form a completely enclosed building. The cylindrical former market and butchery building had two levels, the top level accessed on the eastern side via a ramp beneath the building. A cutting is present east of the structure to facilitate access to the central outdoor area. A retaining wall and slope are present along the northern boundary of the railway embankment, supporting active Network Rail infrastructure. A further retaining wall is present separating the warehouses in the east from the western area, placing the eastern sector at circa 1.00m lower level than the west. A gentle slope is present in the central area, sloping down from the north and south and leading to a cutting in the centre that allows access to the former abattoir building. The surrounding areas in the west and east are generally topographically flat. The Site is predominantly covered in concrete or asphalt hardstands. The retaining wall and slope present along the northern boundary are densely vegetated with multiple semi-mature and mature trees and scrub vegetation. A further area of rough scrub vegetation is present in the very east. There are also areas of landscaped grass along the southern boundary and outside the eastern entrance of the central building.

	A former livestock delivery ramp connects to the railway, which is located on the crest of the embankment (higher elevation). Japanese knotweed has also been identified within the vegetation along the northern boundary and localised on the western boundary. As of March 2025, demolition of the onsite structures in ongoing.

PREVIOUS REPORTS

The following previous reports have been completed for the site:

- 13-492-R1 – Phase I and Phase II Geoenvironmental Site Assessment- Riverpark Trading Estate, 13-429-R1-2, June 2022

This report will act as an update to the above Phase II report.

A desk study and initial conceptual site model was prepared by E3P under a separate title (17-246-R1 Phase I Geoenvironmental Site Assessment, Riverpark Trading Estate, March 2024). This should be read as a precursor to this document.

E3P GROUND INVESTIGATION

Ground Investigation Works	E3P has completed an intrusive ground investigation in 2019 comprising: - 11 x Mechanically excavated trial pits (TP101 – TP111), - 25 x Window sample boreholes (WS101 – WS125), - 5 x Cable percussive boreholes (CP101 – CP105), - 8 x Rotary open holes (RB101 – RB108), and - Construction of environmental monitoring installations. E3P completed an intrusive ground investigation in 2024 comprising: - 18 x Mechanically excavated trial pits (TP201 – TP218), - 11 x Window sample boreholes (WS201 – WS211), - 3 x BRE 365 Soakaways (SA201 – SA203), - 8 x Dynamic sampling boreholes (DBH201 – DBH208), - 3 x Cable percussive boreholes (CP201 – CP203), - 2 x Rotary open holes (RB201 – RB202), - 3 x Concrete wall cores, and - Construction of environmental monitoring installations.
Limitations of the Investigation	Due to the active nature of the site, site investigation works were limited by the presence of current structures, traffic routes and presence of active services across the site. Access was granted to undertake works within the central area of the former butchery building (west) and most easterly warehouse. Where remaining structures were present no access was granted during the 2019 or 2024 phases of investigation. Due to the presence of moving vehicles and the requirement for roadways to remain clear, several locations were impeded/moved to allow safe working. Due to the presence of a steep slope along the northern boundary and the presence of Japanese knotweed in this area investigation was unable to be undertaken in this area.

Ground Conditions	**Made Ground – 0.0m bgl to 5.45m bgl** Made Ground deposits were encountered within all exploratory hole locations to depths of between from ground level to an unproven depth of 5.45 m bgl (WS112) although, in general, Made Ground was encountered to a depth of less than 1.00 m bgl Generally, the Made Ground deposits on site comprised of asphalt across the majority of the site with concrete identified in the east within the warehouse and surrounding the building to a depth of 0.15m bgl. This was underlain by a black gravelly fine to medium sand with gravel of sandstone, mudstone and brick with fragments of concrete, clinker and ash inclusions. In eastern areas, a subbase MOT gravel was encountered underlying the asphalt and concrete which comprised of a yellowish grey sandy gravel of sandstone, mudstone and brick to a depth of 0.60m bgl. Below this, a brown reworked clay was encountered at a maximum unproven depth of 5.45 m bgl (WS112). More generally, this reworked clay is encountered to depths between 1.00 m and 2.00 m bgl. The reworked clay comprised a soft to firm, slightly gravelly sandy clay, with gravel of sandstone, mudstone, brick, timber fragments, and clinker. Deeper Made Ground deposits were encountered within the south west where the site is currently used as a lorry park. Made Ground within this area comprised of a reworked clay of soft to firm light grey mottled brown slightly sandy gravelly clay of sandstone, mudstone, coal and brick with fragments of timber and clinker, to a proven depth of 4.30m bgl within CP202 and unproven depth of 5.45 m bgl within WS112. Made Ground across the site was noted to contain ash and occasional clinker, which is indicative of incinerated waste backfill, which was common at the time of the early to mid-20th century.
	Drift – 0.20m bgl to 17.20m bgl Drift deposits were encountered within the majority of exploratory locations with the exception of locations where the full depth of Made Ground could not be proven. The drift deposits are generally uniform across the site, comprising a stiff to very stiff, high to very high strength, brown, slightly gravelly sandy CLAY with gravel of sandstone, mudstone and rare coal. During the 2019 investigation, localised sand bands were encountered within TP109, CP103 and CP105 as dense brown medium SAND, generally overlying the bedrock with occasional gravel of sandstone.
	Solid – Top of bedrock 5.50m bgl to 17.20m bgl Generally, the solid geology comprised a light / dark grey weathered MUDSTONE with SANDSTONE bands. Red brown SANDSTONE was also encountered at CP104 and CP105. Top of bedrock varied from 5.50 m bgl in the east of the site (CP105) to 17.20 m bgl in the north of the site (RB202). Generally top of bedrock was encountered between 9.00 m bgl and 13.00 m bgl across the majority of the site, with localised areas of deeper drift cover noted in the south west and central northern sectors. The varying depth to bedrock across the site is likely due to the Bradford Fault present across the centre of the site with a downthrow to the north east. A thin (discontinuous) band of coal was encountered as intact at RB102 between 12.70m and 13.00m bgl.

	Groundwater Groundwater strikes were varied across the site, encountered between 0.40 m bgl to 2.10 m bgl. A consistent groundwater table was not encountered during either phase of intrusive works. The glacial clay is stiff high strength with no effective permeability and is therefore not considered to be capable of representing a viable aquifer. The clay also inhibits vertical migration, resulting in localised perched groundwater. There is little infiltration of the site due to the extensive hardstanding.
Concrete Coring	Concrete coring was undertaken within the concrete floor of the eastern warehouse, with concrete thickness of 36cm to 45cm recorded. A 5mm rebar was noted in two layers on the concrete floor. Additionally, wall cores were conducted along the northern wall of the eastern warehouse to investigate the interface between the warehouse and the northern retaining feature. The cores from the wall were generally uniform across the wall with the following stratum; - Concrete (0.00-0.05m) - Brick (0.05-0.24m) - Void (0.24-0.37m) - Concrete reinforced with 10mm rebar (0.36-0.76m) - Made Ground: Gravel (Fill) (0.68-0.80m).

CONTAMINATED LAND ASSESSMENT

Initial Conceptual Site Model	**Human Health** Historic land use as a brick works, current commercial uses, butchery, former abattoir and lorry park and infilled features (ponds and clay pits) are sources of contamination that have been identified within searches completed to date. Made Ground is likely to be present across the site due to development across the site and may be present where ponds have been infilled with anthropogenic material and in those areas, heavy metals, PAH, TPH and asbestos may be present. Historic land use of an abattoir and meat wholesalers that operated within the central buildings may be a potential source of biological pathogens associated with the former slaughter of livestock and removal of animal wastes. Therefore, there is considered to be a low to moderate risk to human health at the site. **Controlled Waters** There has been no significant sources of industrial chemical use or storage on-site, furthermore the former clay pits have only be nominally backfilled with incinerated materials in the mid 20th century. The site CSM has not identified any significant source of pollution.

Initial Conceptual Site Model	There has been no significant sources of industrial chemical use or storage on-site, furthermore the former clay pits have only be nominally backfilled with incinerated materials in the mid 20th century. The site CSM has not identified any significant source of pollution. The site is underlain by circa 15m of likely low permeability clay that will afford protection to the underlying principal aquifer. Furthermore, the site is not located within a source protection zone and the closest abstraction point is located 555m from the site with a general construction use. Therefore, there is a low risk to controlled waters. **Ground Gas** Localised infilled ponds, ditches and Made Ground may contain putrescible materials. Additionally, an off-site historic landfill is recorded 168 m east. These may be a source of ground gas. Given the low permeability of the drift strata, these features are not considered likely to affect a wide area but will need local development assessment.
Human Health	The Tier 2 human health risk assessment has identified the presence of elevated concentrations of inorganic heavy metals (arsenic and lead), organic PAHs (dibenzo(a,h)anthracene, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene) and total petroleum hydrocarbons (TPH C12-C35) in comparison to screening criteria for a residential end use with plant uptake. Elevated PAH, heavy metals and long chain TPH (C16-C35) have primary exposure pathways related to dermal contact and ingestion of soils (PL1 and PL2). The risk to chronic human health can be mitigated through the installation of a suitable cover system in all proposed private gardens, landscaping and public open space to remove any potential for direct exposure to impacted soils. Where hardstand is proposed (roads, plots and driveways), this will sever the contamination pathway and remove the risk to human health. The specific design and installation process for the appropriate cover systems will be clearly defined within the site remediation and enabling works strategy. With regards to the short chain aromatic TPHs C12-16, these present a potential volatilisation to indoor air risk. These elevated concentrations were identified within the shallow made ground soils (<1 m bgl) in two locations during the investigation in 2019. TPH C12-C16 impact has been identified within WS109 (south west) and WS118 (central) and is linked to parking locations of heavy goods vehicles (HGVs). Following the removal of the on-site source (HGVs) volatile TPH impact within these areas should be subject to delineation and further validation to assess chemical suitability for retention on site in an area of no future sensitivity or removal from site. Asbestos in the form of loose amosite fibres has been identified in the granular Made Ground in TP205 at 0.50m bgl and in the previous site investigation in 2019 trace asbestos (loose chrysotile and amosite fibres) were identified within shallow Made Ground soils within WS101 and WS114 at 0.50m and 0.60m bgl. Quantification confirms asbestos to be present at trace amounts (<0.001%). Asbestos quantification should be undertaken to further assess where these soils may be placed. No visual signs of ACM were encountered during the ground investigation; it is therefore, likely that only trace fibres are present. However, due to the nature of the Made Ground and the age of the buildings on site having a likelihood of ACM within the building fabric, further sampling of soils will be required following the demolition of onsite buildings.

Human Health	The soil in TP115 was tested for PCBs due to the proximity to an electricity substation. No PCBs exceeding the GAC screening values were recorded. No significant concentrations of VOCs or SVOCs were identified in the soils submitted for chemical analysis. A sample of the asphalt hardstanding was submitted for coal tar and speciated PAH analysis. Chemical testing results did not identify coal tar within the sample submitted, however, elevated non-volatile PAH and volatile PAH (naphthalene) was recorded above human health screening values. Given the elevated PAH in particular 6.9 mg/kg of naphthalene, this material will not be suitable for use in the development platform. The former abattoir and meat wholesalers that operated within the central buildings is a potential source of biological pathogens associated with the former slaughter of livestock and removal of animal wastes. During the demolition of the former abattoir and meat wholesaler buildings, a watching brief should be implanted during the removal of any tanks, pits and pipework to identify any potentially blood or animal fat impacted soils. Chemical analysis of the natural clay drift deposits has identified these soils to be acceptable for use as subsoil within the proposed garden areas; however, further chemical validation samples will be required to meet regulatory sampling frequency. There are no suitable sources of topsoil available on the site.
Controlled Waters	The ICSM developed within the context of the site setting has only identified a single viable pollutant pathway, which would be the downward migration of potentially mobile phase-soluble contaminants towards the underlying principal aquifer in the east of the site. As such, a comparison of leachate and groundwater results against DWS exceedances has been made. Five groundwater samples and four leachate samples taken across both phases of investigation from varying depths within the Made Ground, were compared to the Tier 2 screening levels. The Tier 2 controlled water risk assessment identified marginally elevated concentrations of inorganic heavy metals (arsenic, total cyanide, and selenium) above drinking water standards (DWS) within the groundwater samples submitted for analysis. Lead and arsenic were identified above DWS in leachate samples. With the exception of lead, which was not identified within groundwater samples, all of the aforementioned heavy metals are considered to be associated with perched water confined within the Made Ground. The elevated concentrations of inorganic heavy metals are deemed to be associated with the historical site use as a brickworks and the limited infilling of clay pits with incinerated (ashy) Made Ground to create a development platform. The presence of >3.00 m (more widely >10.00 m) of low permeability clay cover will inhibit/impede the lateral and vertical migration of perched waters with potential dissolved phase impact, therefore offering protection to the underlying aquifer. Where granular deposits have been encountered (CP103 and CP105), granular high permeability deposits were encountered directly overlying the top of bedrock below sufficient clay cover.

	Given the lack of active groundwater abstraction recorded within 500m of the site, low permeability of the overlying drift limiting vertical migration and low solubilities and concentrations of heavy metals recorded, there is considered to be no unacceptable risk to controlled waters. Based on the above, there is considered to be no significant level of risk to the controlled water receptors.
Ground Gas	Gas monitoring from the 2019 investigation included the following conclusions; • Ground gas monitoring suggests that the majority of the site can be classified as CS1, and in these areas, it is considered that gas protection measures will not be required. • In the vicinity of WS101 carbon dioxide has been identified above the 0.07 l/h Qhg threshold, resulting in a CS2 classification. • E3P recommends the source of the gas be investigated further, targeted for removal, and re-monitored for the purpose of decreasing the overall site to CS1. Gas monitoring from the 2024 program undertaken to date suggests the site can be classified as CS1. However, given the offsite landfill and areas of deep made ground, an allowance should be made for precautionary CS2 measures pending the completion of the final monitoring program and development of the final ground gas risk assessment.
Potable Water Infrastructure	Based on the assessment of current site conditions, barrier pipe will likely be required at the proposed development. This echoes what was found in the 2019 investigation with exceedances of EC10-EC16 and EC16-EC40 Aliphatic and Aromatic Hydrocarbons at pipeline depth. This will need to be confirmed following the completion of a UKWIR risk assessment. Post-remediation and enabling works ground conditions may be different from those identified during this site investigation.

COAL MINING ASSESSMENT

Preliminary Assessment	A review of the Coal Mining Authority Report and mapping indicates that coal mining activity has occurred within the site boundary at depths in excess of 80 m bgl.
Coal Mining Ground Investigation	In due consideration of the potential presence of a sub crop of the Doctor Seam within the north western site boundary and an area of ''coal claim'' in the west, a series of rotary boreholes have been advanced in accordance with Coal Authority Permission ref: 18954 dated 31st October 2019 and Coal Authority Permission ref: 27844 dated 22nd January 2024 to assess the potential presence of shallow workings within this seam and the potential for ground instability to induce a future subsidence event within the proposed development.
Coal Mining Assessment	E3P has reviewed section 5 of the Phase 1 Desk Study (E3P report ref: 17-246-r1, March 2024), BGS geological mapping and CA information, in addition to completing ten 40 m rotary boreholes to investigate shallow mine workings. A summary of the findings is given below:

- The intrusive ground investigations comprising ten deep, rotary boreholes only identified one location where coal was found to be intact at a thickness of 0.30m, which suggests this was not worked.
- There was no other evidence of coal or historic mine workings at the base of the other boreholes.
- No areas of potential shallow mine workings have been identified in the conjectured seam outcrop underlying the northwestern sector of the site or within the coal claim area. The investigation did not identify any potential historical shallow workings.

Given the above, there is not deemed to be an unacceptable risk of subsidence associated with the collapse of unrecorded historic coal mining beneath the site.

GEOTECHNICAL ASSESSMENT

Underground Obstructions & Subterranean hazards	In the centre of the site an obstruction was encountered, which is likely to be associated with the footing of the historic footbridge. No further obstructions were noted during the 2024 site investigation. Brick cobbles and shallow obstructions were encountered throughout the initial investigation in 2019. Significant underground obstructions are also anticipated beneath the footprint of the existing extensive commercial buildings. Large relict structures should be anticipated in the area of the former brickworks and chimney bases. Organic putrescible materials are likely to be present at the west boundary associated with infilled watercourses and ponds. As part of the process of creating a suitable platform for development, all subterranean obstructions will need to be excavated and removed beneath new structures and infrastructure. This will facilitate the construction of the proposed plots as intended. The northern boundary to the railway embankment is supported by extensive retaining structures, it is probable that these structures are founded beneath the existing buildings.
Allowable Bearing Capacity	The underlying natural cohesive drift deposits have been evaluated and found to be stiff to very stiff, with a net Allowable Bearing Capacity (ABC) of approximately >130 kN/m^2 at an approximate depth of 1 meter below ground level (bgl). However, the ABC and depth of competent natural soils have been found to be varied across the site.
Foundation Options	Based on confirmed soil mechanics, cost, and construction feasibility, several foundation options should be considered for low-rise housing. At this time, it is not possible to accurately define the foundation types due to the absence of a detailed tree survey and final development levels/loadings.

Foundation Options	It is highly probable demolition, remediation and enabling works will mean that the natural stratum is a minimum of 1.50m below proposed ground level, this will preclude the use of economic shallow foundations for much of the site. Based on our extensive experience with similar sites, we would anticipate that the final foundation solution would be a combination of the following: • Controlled and validated remediation and ground engineering works to prepare the site for Ground Improvement by Vibro Stone Column to support a doubly reinforced strip foundation. , • Where apartment buildings, tree influence or plots within influencing distance of retaining structures it may be necessary to use a driven pile foundation to ensure the transferal of structural loads to competent stratum and mitigate near surface adverse influences.
Foundations Near Trees	Trees and vegetation have been noted in the embankment along the north and on the western boundary. Foundation depths within the conjectured influence of former, existing or proposed trees will need to be deepened to ensure that structural loading bears within the underlying target founding stratum, which cannot be subject to volumetric instability associated with fluctuation in moisture content.
Heave Precautions Near Trees	Where structures are to be constructed in cohesive soils within the conjectured zone of tree influence, heave precautions should be designed appropriately.
Building Floor Slabs	Ground-bearing floor slabs are not considered viable given the anticipated depths of Made Ground > 600 mm and shallow cohesive soils. Suspended floor slabs should be utilised site wide.
Soakaway Drainage	Three BRE 365 soakaways were conducted across the site. During the tests the water level did not fall below the 75% effective storage depth over a period of 48 hours, as such the test was deemed to have failed. The site is underlain by stiff CLAY to a depth of 17.20 m bgl. Due to the presence of underlying cohesive soils and given that the water level did not drop to the required effective depths during BRE permeability testing (indicating poor drainage conditions), it is considered that soakaway drainage will not be feasible at the subject site.
Sulphate Assessment	Concrete classification for the majority of the site will be DS1 AC1s. Elevated sulphates have been identified within WS202 and WS208 within deeper deposits with a classification of DS-3, AC-2s and DS-2, AC-1s, respectively.
Highway & Infrastructure Construction	A programme of remediation and enabling works will be required to remediate the proposed road subgrade in accordance with the requirements of the Manual of Contract Documents for Highway Works Volume 1 Specification For Highway Works (Series 600-Earthworks) for a method compaction. Bulk earthworks to construct highways to the underside of capping. Enabling works contractor will need to do CBRs to determine the capping layer etc. An underpass/cutting is present on the eastern side of the butchers building. Dependant on final development levels there is potential for a large voided area that will require upfill to a suitable geotechnical design.

CBR Design %	Natural clay soils will provide a CBR in the order of 3–5% during drier climatic periods. However, if water is allowed to shed onto the formation, the CBR will reduce to < 2%, which will require specialist engineering of the subgrade.
Enabling Earthworks	Development levels are unknown at this time; however, significant cut-and-fill works are likely to be required to prepare the development platform. As part of the earthworks design, materials should be assessed and characterised prior to re-use in the construction of upfill to a geotechnical design. All future earthworks should be completed in accordance with a Geotechnical Design Report (GDR) that will consider the ground model within the context of the potential for settlement induced by surcharge from earthworks, dynamic and permanent loading of the development and all known hazards.
Civil Engineering Excavations	In the west trial pits were generally stable in both granular Made Ground and natural strata; as such, it is considered that near-surface excavations will be feasible. In the centre and east of the site excavations were less stable particularly in areas of obstructions and fast water ingress. Site observations indicated that excavations should be feasible in the near surface with normal plant; however, obstructions were identified in the near surface, including potential former footings and floor slabs. It is anticipated that any obstructions will be grubbed out during the reduced-level dig for the substructure works. Excavations through the natural strata were slow given the high strength of the soils. Excavation with normal plant is achievable, however, works are likely to progress at a slower rate with smaller machinery. Due to the depth and variability of the Made Ground and likelihood of trench collapse, it is considered that all excavations are supported or battered back in accordance with guidance contained in CIRIA R97.
Settlement	In-situ geotechnical sampling classified the underlying natural cohesive soils as firm to very stiff, no areas of soft clays have been identified within investigations undertaken to date. Additionally, consolidation testing has not recorded highly compressible soils. Given the above there is deemed to be a very low risk associated with settlement of the underlying natural cohesive strata. The presence of variable historical Made Ground deposits represent a risk associated with the consolidation of materials that could induce unacceptable settlement to structures and infrastructure. Made Ground should be turned over to the top of natural and engineered in line with a suitable geotechnical design. Should ground levels change by over 2.5 m as part of the proposed development, further settlement analysis and zone load testing may be required.
Waste Characterisation	Any material that is to be disposed off-site should undergo assessment using Technical Guidance WM3: *Waste Classification – Guidance on the classification and assessment of waste*. This can be done upon request and in line with the Environment Agency sampling frequencies.
Temporary Works	All temporary works platforms for tracked piling machines, cranes and other mobile plant should be designed and validated by a suitably qualified engineer.

RECOMMENDATIONS

Based on the findings of the Geoenvironmental site assessment and the various conclusions drawn, the following additional works are recommended to be completed in due course:

Recommendations for Planning:

- Remediation Design and Validation Strategy.
- Remediation Validation Completion Report.
- Build Phase Remediation Validation.
- Ground Gas Protection Desing Report

Recommendations for Future Development Design:

- Plot-specific foundation schedule (upon receipt of the final development levels).
- Geotechnical Design Report – Earthworks.
- Geotechnical Temporary Works Design.
- Remediation Phase Waste Management (CL: AIRE DoW CoP MMP).

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15-974-R1-018 - Contamination Issues Plan
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Kellen Homes Drawing KH012-Q

1. INTRODUCTION

1.1. BACKGROUND

E3P has been commissioned by Kellen Homes (the client) to undertake a Phase II Geoenvironmental Site Assessment at Riverpark Road, Manchester.

This report is required to determine potential contaminated land liabilities, remediation requirements, and geotechnical engineering works that will be required as part of the proposed development of a low-rise residential development.

E3P previously completed an initial phase of ground investigation in 2019. The ground conditions and chemical and geotechnical data from the 2019 E3P site investigation are included throughout this report.

A desk study and initial conceptual site model was prepared by E3P under a separate title (17-246-R1 Phase I Geoenvironmental Site Assessment, Riverpark Trading Estate, March 2024). This should be read as a precursor to this document.

1.2. PROPOSED DEVELOPMENT

Kellen Homes intends to create a new community on a sustainably located site in East Manchester, delivering new family housing and affordable homes. The proposed residential development will comprise a total of 221 low rise residential dwellings and 277 apartments across five buildings ranging from 4 to 6 storeys in height with associated gardens, estate roads and infrastructure.

Kellen Homes Drawing KH012-Q (APPENDIX IV) identifies the proposed development layout.

A snapshot of the proposed development layout is indicated in Figure 1.

Figure 1 Snapshot of Proposed Development



1.3. OBJECTIVES AND SCOPE

The objectives of the geoenvironmental investigation are as follows:

- Review historical plans, geology, hydrogeology, site sensitivity, floodplain issues, mining records and any local authority information available to complete a desk study in line with Environment Agency (EA) document Land Contamination: Risk Management (LCRM) (updated June 2023).
- Undertake a phase of sampling and analysis to provide an overview of the environmental issues identified.
- Assess the implications of any potential environmental risks, liabilities, and development constraints associated with the site concerning its future use and off-site receptors.
- Assess the geotechnical information and provide recommendations concerning foundations, pavement construction and floor slabs.
- Assess the coal mining-related information and provide recommendations regarding any future treatment; and,
- Provide recommendations regarding future works required.

1.4. SOURCES OF INFORMATION

Background information was sought from the following sources:

- Groundsure Enviro+Geo Insight Search Reference GS-C3Q-6HI-L76-DJJ;
- Historical mapping dated 1848 to 2024. A selection of historical maps is reproduced in APPENDIX VI;
- Online planning records held by Manchester City Council;
- Consultations with representatives of Manchester City Council;
- Consultations with representatives of the Coal Authority;
- Magic Map Groundwater Vulnerability Map;
- Radon: Guidance on protective measures for new buildings (BRE Document BR 211, 2007);
- British Geological Survey Map;
- Groundsure IO database;
- https://zeticauxo.com/downloads-and-resources/risk-maps/;
- https://flood-map-for-planning.service.gov.uk
- Search results | Catchment Data Explorer | Catchment Data Explorer.
- E3P Reports: 17-246-R1 Phase I Geoenvironmental Site Assessment, Riverpark Trading Estate, March 2024 and 13-492-R1 – Phase I and Phase II Geoenvironmental Site Assessment-Riverpark Trading Estate, 13-429-R1-2, June 2022.

1.5. SCOPE OF WORKS

The scope of work includes the elements included in Table 1.

Table 1 Scope of Works

GROUND INVESTIGATION
Design of suitable ground investigation
Window sample probeholes with the construction of environmental monitoring installations
Deep cable percussive boreholes with the construction of groundwater monitoring installations
Deep rotary boreholes
Dynamic boreholes with the construction of environmental monitoring installations
Mechanically excavated trial pits
Permeability testing (BRE 365 Soakaway tests)
Concrete coring
Soil and groundwater sampling
TESTING AND MONITORING
In-situ geotechnical testing
Chemical and geotechnical analysis
In-situ permeability testing
Groundwater monitoring
Ground gas monitoring
ASSESSMENT AND REPORTING
Factual and interpretative reporting
Contamination risk assessment and conceptual site model
Geotechnical assessment and interpretation

1.6. LIMITATIONS

The limitations of this report are presented in APPENDIX I.

1.7. RISK CLASSIFICATION

The description of risk classification and the likely action required as set out in CIRIA C552 are included in APPENDIX III.

1.8. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed or with whom an assignment has been agreed. Should any third party wish to use or rely upon the report's contents, written approval must be sought from E3P; a charge may be levied against such consent.

2. E3P GROUND INVESTIGATION

2.1. GENERAL OVERVIEW

A ground investigation has been designed based on the findings of the desk study and previous E3P site investigation conducted in 2019, with exploratory holes advanced to target specific potential contaminant sources. The investigation has also been used to collect geotechnical information to assist in the design and construction of the proposed development.

An initial intrusive investigation was completed between 5th November 2019 and 22nd November 2019.

Supplementary exploratory fieldwork was completed between 15th January 2024 and 19th January 2024.

The works are summarised in Table 2.

2.2. PREVIOUS REPORTS

The following previous reports have been completed for the site:

- Phase I and Phase II Geoenvironmental Site Assessment- Riverpark Trading Estate, 13-429-R1-2, June 2022; and
- Phase I Geoenvironmental Site Assessment, Riverpark Trading Estate, 17-246-R1 March 2024.

The E3P Phase I Report (17-246-R1, March 2024) should be read as a precursor to this document.

The findings, inclusive of ground conditions, chemical data and geotechnical results from the previous E3P report (13-429-R1-2, June 2022) have been included in the assessment(s) undertaken within this report.

This report will act as an update to the above report.

2.3. LIMITATIONS OF THE INVESTIGATION

Due to the active nature of the site, site investigation works were limited by the presence of current structures, traffic routes and presence of active services across the site.

Access was granted to undertake works within the central area of the former butchery building (west) and most easterly warehouse. Where remaining structures were present no access was granted during the 2019 or 2024 phases of investigation.

Due to the presence of moving vehicles and the requirement for roadways to remain clear, several locations were impeded/moved to allow safe working.

Due to the presence of a steep slope along the northern boundary and the presence of Japanese knotweed in this area investigation was unable to be undertaken in this area.

2.4. SCOPE OF GROUND INVESTIGATION

A summary of the fieldwork completed is included in Table 2. The 100 series locations (e.g. WS101) were undertaken as part of the 2019 investigation, the 200 series (e.g WS201) were undertaken as part of the 2024 investigation. WS123, WS125 and CP104 from the 2019 investigation fall outside the revised redline boundary and have not been included.

Table 2 Summary of Fieldwork

POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (M BGL)	MONITORING WELLS RESPONSE ZONE (M BGL)
Ground conditions Including the Presence/Nature of Obstructions in Area of Former Brickworks (West)	TP101	Mechanically Excavated Trial Pit	2.20	-
	TP102		2.00	-
	TP208		1.80	-
	TP213		1.10	-
	WS110	Window Sample Probehole	0.30	-
	WS113		0.50	-
	WS114		3.45	0.50-3.00
Ground conditions in Area of Level Change (West)	TP104	Mechanically Excavated Trial Pit	0.80	-
	TP216		3.20	-
Electrical Substation (West)	TP215		2.65	-
	WS112	Window Sample Probehole	5.45	0.50-4.00
Ground conditions in Area of Level Change (North)	WS104		0.50	-
	TP108	Mechanically Excavated Trial Pit	2.20	-
	TP207		1.60	-
Historic Pond (West)	TP217		1.80	-
	WS111	Window Sample Probehole	4.45	1.00-3.00
Ground conditions Including the Presence/Nature of Obstructions in Former Clay Pit(s)	WS101		5.45	0.50-3.00
	WS102		5.45	0.50-4.00
	WS103		4.45	-
	WS105		2.45	-
	WS106		3.45	0.50-3.00
	WS108		3.80	0.50-1.00
	WS115		0.60	-
	WS117		3.45	0.50-3.00
	WS118		3.45	0.50-3.50
	WS119		2.45	0.50-1.00
	WS122		2.45	0.50-1.50
	WS204		5.45	-
	WS205		5.45	1.00-2.00
	TP203	Mechanically Excavated Trial Pit	0.90	-
	TP204		1.60	-
	TP205		1.50	-
	TP209		1.50	-
	TP218		2.10	-
	TP109		2.20	-

POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (M BGL)	MONITORING WELLS RESPONSE ZONE (M BGL)
Ground conditions Including the Presence/Nature of Obstructions in Former Clay Pit(s)	TP110	Mechanically Excavated Trial Pit	1.80	-
	TP111		2.00	-
Former Tramway	TP206		1.90	-
	WS206	Window Sample Probehole	1.96	-
General Ground Conditions Including the Presence/ Nature of Obstructions	WS107		2.45	0.50-1.00
	WS109		5.45	0.50-2.00
	WS116		0.60	-
	WS121		2.45	0.50-1.50
	WS124		1.45	-
	TP103	Mechanically Excavated Trial Pit	2.00	-
	TP105		2.00	-
	TP106		1.90	-
	TP107		1.90	-
	TP201		1.50	-
	TP202		1.85	-
	TP210		1.70	-
	TP211		1.95	-
	TP212		2.10	-
	TP214		1.70	-
Former Tank (Identified in 2019 as a storm water overflow)	WS120	Window Sample Probehole	0.60	-
Ground conditions Including the Presence/Nature of Obstructions Beneath Current Structures	WS201		4.43	1.00–2.00
	WS202		3.43	1.00–3.00
	WS203		3.43	0.50–1.50
	WS207		3.93	0.50–3.00
	WS208		5.45	N/A
	WS209		5.45	1.00–4.00
	WS210		5.45	0.50–1.00
	WS211		5.13	1.00–4.50
Investigation of Deeper Soil Horizons Across the Site to Aid Foundation Design	CP101	Cable Percussive Borehole	16.50	-
	CP102		12.00	-
	CP103		12.00	-
	CP105		7.00	-
	CP202		11.40	3.30–4.30
	CP203		11.40	-
Investigation of Mine Workings Across the Site	RB101 – RB108	Rotary open hole	40.0	-
	CP/RB201 - RB202		40.0	-
Retaining Wall Investigation	Wall 201	Concrete Coring	0.80	-
	Wall 202		0.80	-
	Wall 203		0.80	-
Areas where depth of Made Ground was not proven within 2019 investigation	DBH201	Dynamic Sampling and Probing	8.00	0.50-1.00
	DBH202		5.00	-
	DBH203		7.00	0.50-1.00
	DBH204		8.00	-

POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (M BGL)	MONITORING WELLS RESPONSE ZONE (M BGL)
Areas where depth of Made Ground was not proven within 2019 investigation	DBH205	Dynamic Sampling and Probing	8.00	0.50-1.00
	DBH206		10.00	-
	DBH207		12.00	1.00-2.50
	DBH208		7.00	-

Mechanically excavated trial pits were advanced to investigate ground conditions and to retrieve environmental samples, spatially distributed to offer the maximum site coverage whilst also being advanced to target specific contaminant sources.

Window sample probeholes were advanced to undertake in-situ detailed geotechnical testing, obtain environmental samples and install groundwater and ground gas monitoring wells.

Rotary boreholes were advanced to investigate the potential presence of shallow mine workings. These boreholes were drilled in accordance with the CA permissions process (2019 permit number: 18954, 2024 permit number: 27844) and industry best practices.

Dynamic boreholes were completed to assess ground conditions across the site in areas where the depth of Made Ground could not be proven within the initial 2019 site investigation and to install groundwater and ground gas monitoring wells.

Cable percussive boreholes were advanced to undertake in-situ detailed geotechnical testing of deeper soil horizons.

Three concrete cores were taken from the northern wall of the eastern warehouse, to investigate the interaction between the warehouse structure and retaining feature.

The sampling locations are illustrated in Drawing 17-246-005 (APPENDIX IV). The ground conditions encountered are indicated on the logs, which are provided in APPENDIX VII.

Return visits were made to monitor installations for groundwater level and gas concentrations. In addition, selected wells were purged and samples of groundwater recovered for chemical analysis.

2.5. IN-SITU STANDARD PENETRATION TESTING (SPT)

In-situ geotechnical testing was conducted using the standard penetration test (SPT) and, where the ground is granular, a 60° cone (SPT(C)) was used instead of the sampling tube. The results are shown in the probehole logs in APPENDIX VI, presented in and discussed in Section 6.

2.6. PERMEABILITY TESTS

Three BRE 365 Soakaway tests were undertaken in order to assess the likely permeability of the underlying strata to determine the potential suitability for soakaway drainage within the proposed development. The results are presented in Table 30, and the test certificates are included in APPENDIX IX.

2.7. LABORATORY ANALYSIS

Selected soil samples were submitted for a range of chemical and geotechnical analysis, summarised in Table 3.

Table 3 Summary of Laboratory Analysis

CHEMICAL ANALYSIS
Metals
pH, total sulphate, water-soluble sulphate (2:1 extract)
Sulphide
Cyanide
Phenols
Total and speciated polycyclic aromatic hydrocarbons (PAHs)
Semi-Volatile Organic Compounds (SVOCs)
Volatile Organic Compounds (VOCs)
Asbestos identification and quantification
Speciated and banded total petroleum hydrocarbons (TPHs)
GEOTECHNICAL ANALYSIS
Atterberg limits determinations
Moisture content
Single-stage triaxial tests
Oedometer tests
Particle size distribution
Optimum moisture content with a 4.5kg rammer

2.8. STORAGE, PRESERVATION AND TRANSPORT OF SAMPLES

Measures taken to ensure the quality and integrity of the collected samples, from collection to receipt of the samples by the laboratory, are summarised in Table 4.

Table 4 Sample Integrity Information

SUBJECT	CHEMICAL SAMPLING	
Storage	**Soil**	**Groundwater**
	Glass jars supplied by the laboratory were used for the collection of soil samples to be analysed for VOCs. Plastic tubs were used to collect soil samples for metals analysis and asbestos screening.	Glass vials supplied by the laboratory were used for the collection of samples to be analysed for VOCs. Samples to be analysed for lower volatility compounds were stored in laboratory-prepared glass jars.
Preservation	Soil and groundwater sample containers were filled to minimise headspace prior to sealing and stored at a low temperature within cool boxes with cooling aids to minimise the loss of volatile contaminants and reduce microbial activity during the collection of samples.	
Sample Integrity	Dedicated disposable nitrile gloves were worn and changed between sample collections to prevent cross-contamination.	Groundwater samples were collected using dedicated plastic tubing, which was changed between monitoring well locations to prevent cross-contamination.
Transport	Samples were stored and shipped in dedicated sample boxes provided by the laboratory. Sample details were recorded on the laboratory chain of custody form enclosed with the samples prior to dispatch. Scheduling information for the samples was confirmed with the laboratory via email.	

Chemical analysis has been undertaken by an accredited laboratory with the testing results summarised and discussed in Section 4 and the testing certificates included in APPENDIX VIII.

Geotechnical samples were collected as required per location immediately after excavation, labelled and sealed to minimise moisture loss. The geotechnical samples were collected and couriered by a dedicated courier to an accredited geotechnical testing laboratory. The testing results are summarised and discussed in Section 6 and the testing certificates included in APPENDIX IX.

3. GROUND AND GROUNDWATER CONDITIONS

3.1. SUMMARY OF GROUND CONDITIONS

The ground investigation generally confirms the published geology and identifies the strata set out in Table 5 and Table 6

Table 5 Summary of Strata 2019 Investigation

HOLE	DEPTH TO STRATUM (M BGL)				
	MADE GROUND	STIFF CLAY	SAND	COAL	BEDROCK
TP101	0.00-0.80	0.80-2.20	-	-	-
TP102	0.00-0.70	0.70-2.00	-	-	-
TP103	0.00-0.60	0.60-2.00	-	-	-
TP104	0.00->0.80	-	-	-	-
TP105	0.00-0.60	0.60-2.00	-	-	-
TP106	0.00-0.50	0.50-1.90	-	-	-
TP107	0.00-0.80	0.80-1.90	-	-	-
TP108	0.00-0.80	0.80-2.20	-	-	-
TP109	0.00-0.30	0.30-2.00	2.00-2.20	-	-
TP110	0.00-0.60	0.60-1.80	-	-	-
TP111	0.00->2.00	-	-	-	-
WS101	0.00-0.50	0.50-5.45	-	-	-
WS102	0.00-0.50	0.50-5.45	-	-	-
WS103	0.00-0.60	0.60-4.45	-	-	-
WS104	0.00->0.50	-	-	-	-
WS105	0.00->2.45	-	-	-	-
WS106	0.00-0.20	0.20-3.45	-	-	-
WS107	0.00->2.45	-	-	-	-
WS108	0.00-1.20	1.20-3.80	-	-	-
WS109	0.00-1.10	1.10-5.45	-	-	-
WS110	0.00->0.30	-	-	-	-
WS111	0.00-0.80	0.80-3.45	-	-	-
WS112	0.00->5.45	-	-	-	-
WS113	0.00->0.50	-	-	-	-
WS114	0.00-0.60	0.60-3.45	-	-	-
WS115	0.00->0.60	-	-	-	-
WS116	0.00->0.60	-	-	-	-
WS117	0.00-2.90	2.90-3.45	-	-	-
WS118	0.00-0.80	0.80-3.45	-	-	-
WS119	0.00-1.10	1.10-2.45	-	-	-
WS120	0.00->0.60	-	-	-	-
WS121	0.00-0.40	0.40-2.45	-	-	-
WS122	0.00-0.80	0.80-2.45	-	-	-
WS124	0.00-0.70	0.70-1.45	-	-	-
CP101	0.00-10.50	10.50-15.00	-	-	15.00-16.50
CP102	0.00-0.80	0.80-9.10	-	-	9.10-12.00
CP103	0.00-0.60	0.60-7.60	7.60-9.00	-	-
CP105	0.00-1.00	1.00-4.20	4.20-5.50	-	5.50-7.00
RB101	0.00-0.60	0.60-14.00	-	-	14.00-40.00
RB102	0.00-0.50	0.50-12.70	-	12.70-13.00	13.00-40.00
RB103	0.00-0.80	0.80-9.10	-	-	9.10-40.00
RB104	0.00-0.60	0.60-7.60	7.60-9.00	-	9.00-40.00
RB105	0.00-0.40	0.40-10.50	-	-	10.50-40.00

HOLE	DEPTH TO STRATUM (M BGL)				
	MADE GROUND	STIFF CLAY	SAND	COAL	BEDROCK
RB106	0.00-0.30	0.30-11.70	-	-	11.70-40.00
RB107	0.00-0.80	0.80-12.10	-	-	12.10-40.00
RB108	0.00-0.50	0.50-8.90	-	-	8.90-40.00

Table 6 Summary of Strata 2024 Investigation

HOLE	DEPTH TO STRATUM (M BGL)		
	MADE GROUND	STIFF CLAY	BEDROCK
TP201	0.00–0.40	0.40–1.50	–
TP202	0.00–0.60	0.60–1.85	–
TP203	0.00–0.90	–	–
TP204	0.00–1.60	–	–
TP205	0.00–1.50	–	–
TP206	0.00–1.90	–	–
TP207	0.00–0.50	0.50–1.60	–
TP208	0.00–0.70	0.70–1.80	–
TP209	0.00–0.40	0.40–1.50	–
TP210	0.00–0.70	0.70–1.70	–
TP211	0.00–0.70	0.70–1.95	–
TP212	0.00–1.00	1.00–2.10	–
TP213	0.00–0.60	0.60–1.10	–
TP214	0.00–0.40	0.40–1.70	–
TP215	0.00–1.90	1.90–2.65	–
TP216	0.00–3.20	–	–
TP217	0.00–0.70	0.70–1.80	–
TP218	0.00–0.60	0.60–2.10	–
WS201	0.00–2.30	2.30–4.43	–
WS202	0.00–0.90	0.90–3.43	–
WS203	0.00–2.00	2.00–3.43	–
WS204	0.00–2.20	2.20–3.98	–
WS205	0.00–2.30	2.30–5.43	–
WS206	0.00–1.80	–	–
WS207	0.00–0.50	0.50–3.93	–
WS208	0.00–1.10	1.10–5.45	–
WS209	0.00–0.60	0.60–5.45	–
WS210	0.00–0.80	0.80–5.45	–
WS211	0.00–0.70	0.70–5.13	–
DBH201	0.00–1.50	1.50–15.00	–
DBH202	0.00–1.30	1.30–5.00	–
DBH203	0.00–2.00	2.00–15.00	–
DBH204	0.00–2.40	2.40–8.00	–
DBH205	0.00–1.10	1.10–8.00(15)	–
DBH206	0.00–1.80	1.80–10(15)	–
DBH207	0.00–2.80	2.80–12.00(15)	–
DBH208	0.00–1.50	1.50–7.00(15)	–
CP/RB201	0.00–0.80	0.80–16.60	16.60–40.00
CP202	0.00–4.30	4.30–11.40	–
CP203	0.00–0.60	0.60–11.40	–
RB202	0.00–0.70	0.70–17.20	17.20–40.00

3.2. MADE GROUND

Made Ground deposits were encountered within all exploratory hole locations to depths of between from ground level to an unproven depth of 5.45 m bgl (WS112), although, in general, Made Ground was encountered to a depth of less than 1.00 m bgl.

During the 2019 investigation, the full depth of Made Ground could not be proven within eleven locations across the site (TP104, TP111, WS104-WS105, WS107, WS110, WS112-WS113, WS115-WS116 and WS120), the majority of these within the window sample probeholes due to the presence of obstructions of brick cobbles loose Made Ground falling in underneath the borehole casing.

During the 2024 investigation, the full depth of Made Ground was not proven within TP203, TP204 and TP206 located in the east and centre of the site respectively due to terminated pits due to water ingress. TP205 was terminated in Made Ground due to the presence of a potential underground service with pea gravel noted, however, WS105 adjacent to this location identified natural strata from 2.30m bgl. Furthermore, Made Ground could not be proven within TP216 located in the west of the site due to the limit of the excavator and in the centre of the site WS206 was terminated due to an obstruction, likely associated with the former footbridge stanchion.

Generally, the Made Ground deposits on site comprised asphalt across the majority of the site, with concrete identified in the east within the warehouse and surrounding the building to a depth of 0.15m bgl. This was underlain by a black gravelly fine to medium sand with gravel of sandstone, mudstone and brick with fragments of concrete, clinker and ash inclusions. In eastern areas, a subbase MOT gravel was encountered underlying the asphalt and concrete which comprised of a yellowish grey sandy gravel of sandstone, mudstone and brick to a depth of 0.60m bgl.

Below this a brown reworked clay was encountered to a maximum unproven depth of 5.45 m bgl (WS112) was encountered, more generally, this reworked clay is encountered to depths between 1.00 m and 2.00 m bgl. The reworked clay comprised of a soft to firm slightly gravelly sandy clay, with gravel of sandstone, mudstone, brick and fragments of timber and clinker.

Deeper made ground deposits were encountered within the southwest of the site, which is currently used as a lorry park. Made Ground within this area comprised of a reworked clay of soft to firm light grey mottled brown slightly sandy gravelly clay of sandstone, mudstone, coal and brick with fragments of timber and clinker, to a proven depth of 4.30m bgl within CP202 and unproven depth of 5.45 m bgl within WS112. This correlates with the information from the Phase 1 Desk Study, which identified former ponds and deeper areas of clay extraction to the west of the brickworks.

Within TP215 Made Ground, it is comprised of a black gravelly clayey fine to medium sand with gravel of sandstone and brick, with frequent fragments of plastic and calcareous shells.

Made Ground across the site was noted to contain ash and occasional clinker, which is indicative of incinerated waste backfill, which was a common source of material used to raise levels in the mid 20th century when the site was levelled for the abattoir.

A Depth of Made Ground Plan is presented as Drawing 17-246-003 in APPENDIX IV.

3.3. DRIFT DEPOSITS

Drift deposits were encountered within the majority of exploratory locations with the exception of locations where the full depth of Made Ground could not be proven. The drift deposits are generally uniform across the site, comprising a stiff to very stiff, high to very high strength, brown, slightly gravelly sandy CLAY with gravel of sandstone, mudstone and rare coal.

During the 2019 investigation, rare sand bands were encountered within TP109, CP103, and CP105, as dense brown medium SAND with occasional gravel of sandstone, which was 0.20 – 1.40 m thick.

3.4. SOLID GEOLOGY

The solid bedrock geology was encountered between 5.50m and 40.00m bgl.

Generally, the solid geology comprised a light / dark grey weathered MUDSTONE with SANDSTONE bands. Red brown SANDSTONE was also encountered at CP104 and CP105.

Top of bedrock varied from 5.50 m bgl in the east of the site (CP105) to 17.20 m bgl in the north of the site (RB202). Generally top of bedrock was encountered between 9.00 m bgl and 13.00 m bgl across the majority of the site, with localised areas of deeper drift cover noted in the south west and central northern sectors.

The varying depth to bedrock across the site is likely due to the Bradford Fault present across the centre of the site with a downthrow to the north east.

Coal was encountered as intact at RB102 between 12.70m and 13.00m bgl.

A depth to bedrock plan is provided as Drawing 17-246-012 in APPENDIX IV. Review of this plan shows that the top of bedrock falls gently northeast to southwest, with a fall of circa 10 m across the site (circa 550 m). This is a slope of circa 1:55. No highwall associated with the Bradford Fault has been encountered.

3.5. GROUNDWATER

Groundwater strikes were varied across the site, encountered between 0.40 m bgl to 4.30 m bgl. A consistent groundwater table was not encountered during either phase of intrusive works.

The depth of the seepages are shown on the exploratory hole records in APPENDIX VII and are summarised in Table 7.

Table 7 Summary of Groundwater Strikes

LOCATION	DEPTH TO STRIKE (M)	NOTES
TP101	0.70	Perched - slow ingress
TP103	0.50	Perched - slow ingress
TP104	0.40	Slow ingress
TP105	0.60	Perched - slow ingress
TP106	0.40	Perched - slow ingress
TP107	0.70	Perched - slow ingress
WS112	2.10	Slow ingress
WS122	1.00	Perched - slow ingress
WS124	0.70	Perched - slow ingress
CP/RB201	0.70	Perched in Made Ground
CP/RB201	4.30	Groundwater strike
CP202	0.60	Perched in Made Ground
TP203	0.60	Fast ingress
TP204	1.30	Moderate ingress
TP205	1.40	Seepage
TP206	1.00	Perched in Made Ground
TP206	1.70	Fast ingress
TP215	2.00	Peached in Made Ground
TP216	1.20	Perched in Made Ground
WS203	1.60	Perched in Made Ground

Monitoring was undertaken using an electronic dip meter to record the depth of groundwater. These results are summarised in Section 4.5.

No true groundwater body was identified, and we all logged the groundwater strikes as perched and discontinuous.

3.6. CONCRETE CORING

Concrete coring was undertaken within the concrete floor of the eastern warehouse, with concrete thickness of 36cm to 45cm recorded. A 5mm rebar was noted in two layers on the concrete floor.

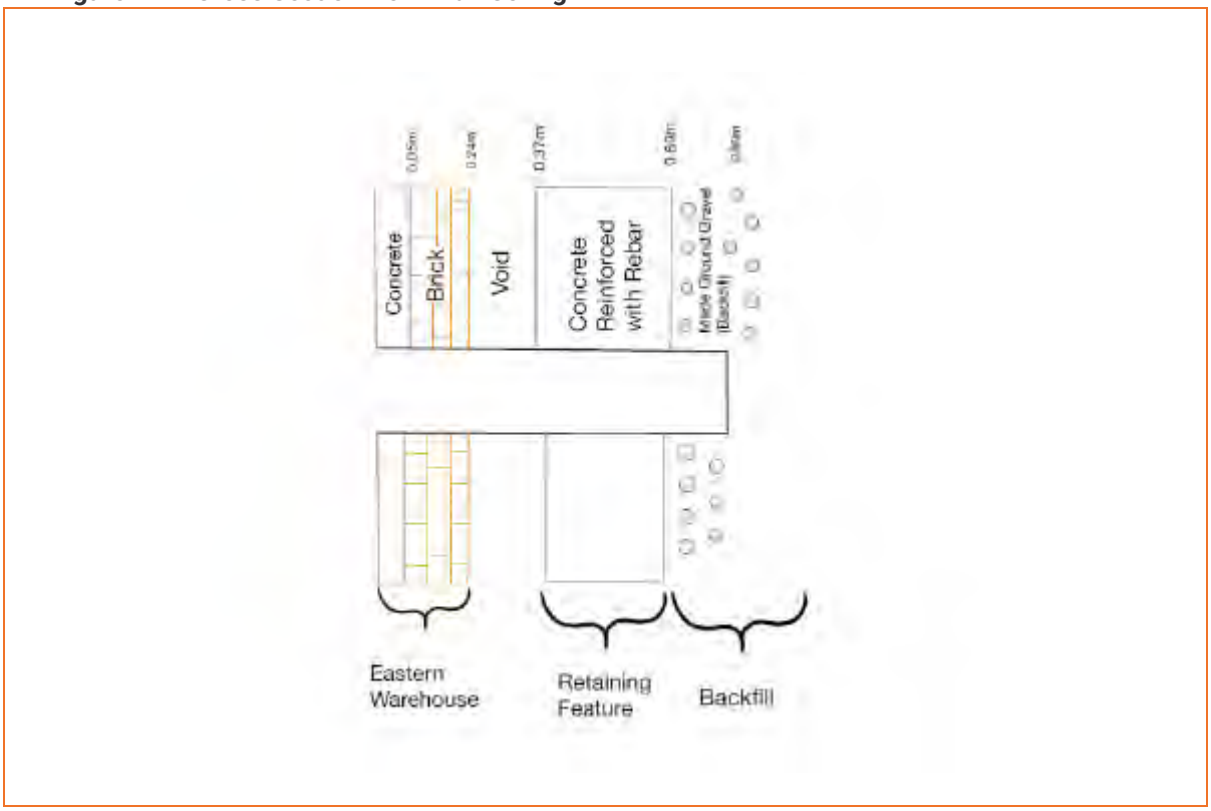
Additionally, three internal wall cores were conducted along the northern wall of the eastern warehouse to investigate the interface between the warehouse and the northern retaining feature.

The cores from the wall were generally uniform across the wall with the following stratum.

Concrete (0.00-0.05m), Brick (0.05-0.24m) Void (0.24-0.37m) Concrete reinforced with 10mm rebar (0.36-0.76m) Made Ground: Gravel (Fill) (0.68-0.80m).

Figure 2 shows a snapshot of a cross section through the wall and retaining feature, presented as Drawing 17-246-016 in APPENDIX IV.

Figure 2 Cross Section from Wall Coring



The void identified within the wall cores suggests that the eastern warehouse is separate from the retaining structure along the northern boundary. However, this should be confirmed by a demolition contractor prior to demolition works.

3.7. GEOLOGICAL CROSS-SECTION

A geological cross-section is included in APPENDIX IV as Section Line 2 (South-North) and Section Line 1 (East-West), and a snapshot is shown in Figure 3 and 4.

Figure 3 Geological Cross Section (South-North)

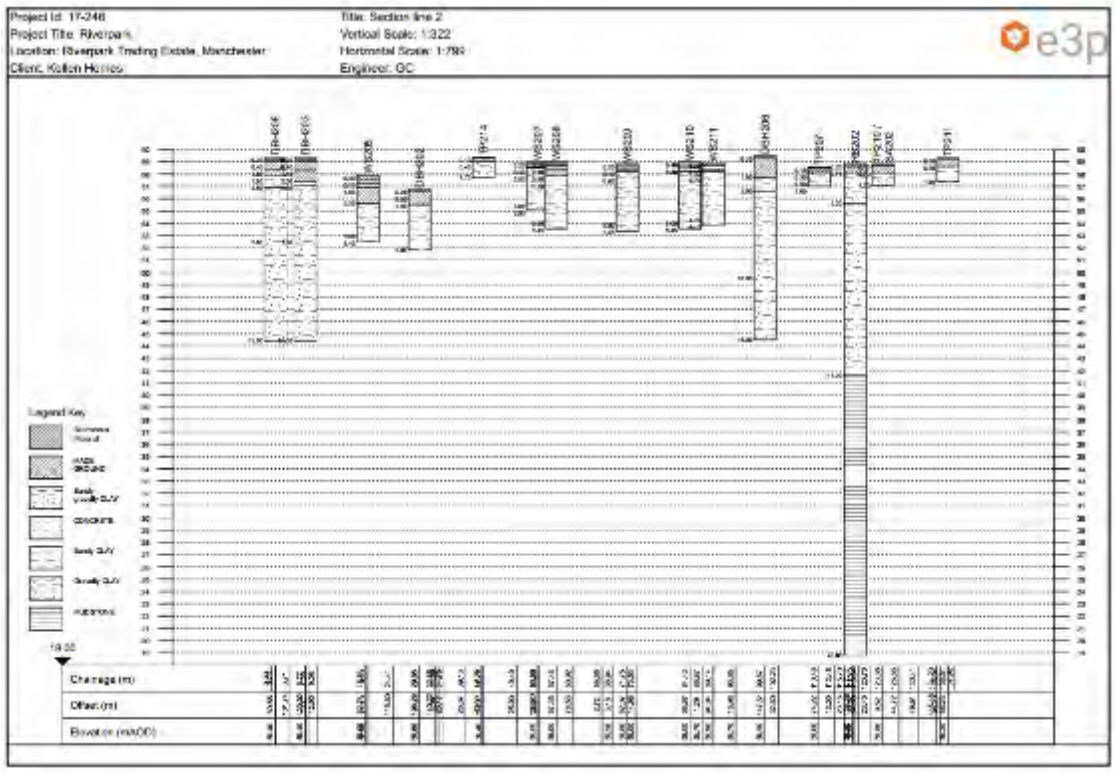
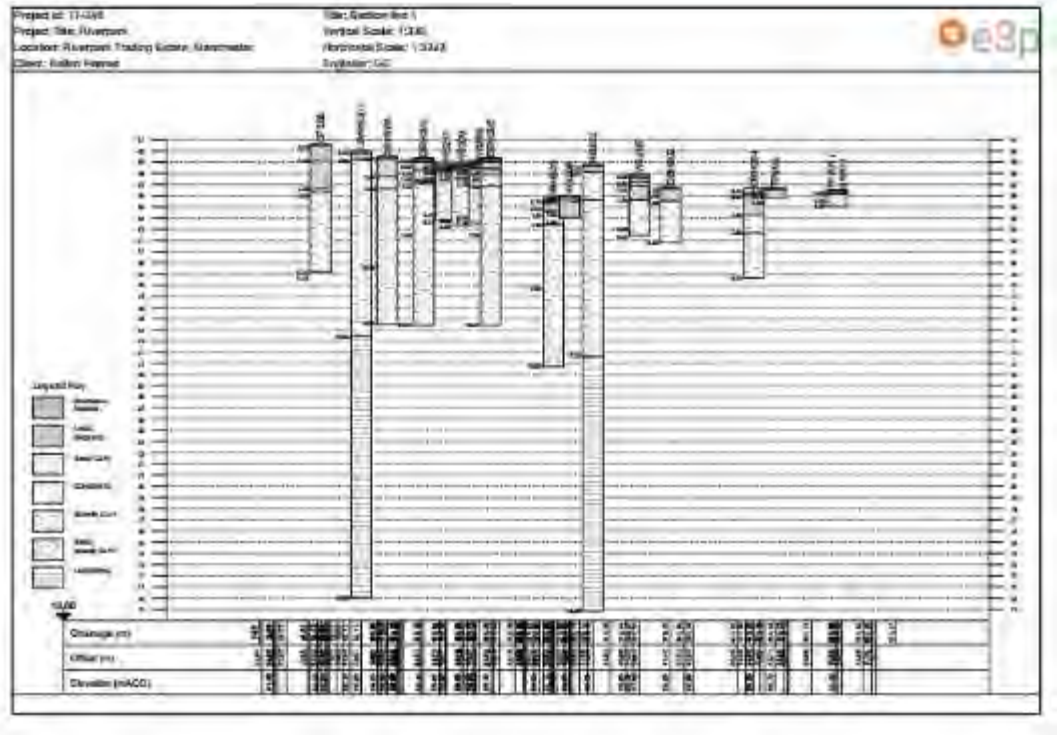


Figure 4 Geological Cross Section (East-West)



3.8. VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

Visual and olfactory evidence of potential contamination has been identified during both phases of the ground investigation, and these are summarised in Table 8.

Table 8 Summary of Visual and Olfactory Evidence of Contamination

LOCATION	DEPTH (M)	STRATUM	NOTES
TP101	0.30-0.80	Made Ground	Ash
TP102	0.30-0.70	Made Ground	Ash
TP103	0.30-0.60	Made Ground	Ash
TP104	0.30-0.80	Made Ground	Ash
TP105	0.10-0.60	Made Ground	Ash
TP106	0.10-0.50	Made Ground	Ash
TP107	0.30-0.80	Made Ground	Ash
TP108	0.25-0.80	Made Ground	Ash
TP109	0.10-0.30	Made Ground	Ash
TP110	0.20-0.60	Made Ground	Ash
WS101	0.10-0.30	Made Ground	Ash
WS102	0.30-0.50	Made Ground	Ash
WS103	0.10-0.60	Made Ground	Ash
WS107	0.30-2.45	Made Ground	Ash
WS108	0.10-1.20	Made Ground	Ash
WS110	0.10-0.30	Made Ground	Ash
WS112	0.50-1.00	Made Ground	Ash
WS114	0.30-0.60	Made Ground	Ash
WS115	0.30-0.60	Made Ground	Ash
WS116	0.30-0.60	Made Ground	Ash
WS117	0.40-2.90	Made Ground	Ash

LOCATION	DEPTH (M)	STRATUM	NOTES
WS118	0.30-0.80	Made Ground	Ash
WS119	0.10-1.10	Made Ground	Ash
WS120	0.30-0.60	Made Ground	Ash
WS121	0.20-0.40	Made Ground	Ash
WS122	0.50-0.80	Made Ground	Ash
WS124	0.30-0.70	Made Ground	Ash
CP101	0.90-10.50	Made Ground	Ash
CP102	0.70-0.80	Made Ground	Ash and hydrocarbon sheen and odour
TP204	0.80-1.60	Made Ground	Clinker
TP205	0.25-0.80	Made Ground	Ash
TP206	0.15-0.80	Made Ground	Ash
TP207	0.10-0.30	Made Ground	Ash
TP208/SA201	0.25-0.50	Made Ground	Ash and Clinker
TP210/SA202	0.10-0.70	Made Ground	Ash and Clinker
TP212	0.10-0.60	Made Ground	Ash
TP215	0.00-0.75	Made Ground	Ash
TP216	0.20-0.60	Made Ground	Ash and Clinker
TP217	0.15-0.70	Made Ground	Ash

3.9. OBSTRUCTIONS

The presence of obstructions in the form of brick cobbles and dense and stiff Made Ground were identified in 18 locations across the site limited the full depth achieved within the window sample probeholes during the initial phase of investigation with the positions summarised in Table 9 and marked on the depth of Made Ground drawing 17-246-006 (APPENDIX IV).

Significant underground obstructions are also anticipated beneath the footprint of the commercial buildings.

Obstructions were identified in the centre of the site during the second phase of investigation (WS206), with the positions summarised in Drawing 17-246-015 (APPENDIX IV). This obstruction is likely related to the former footbridge stanchion. A concrete obstruction was encountered in the south east (TP203), associated with the eastern warehouse substructure.

Table 9 Summary of Obstructions (2024 investigation)

LOCATION	DEPTH (M)	STRATUM	NOTES
TP203	0.90	Made Ground	Concrete Obstruction
WS206	1.96	Made Ground	Likely footbridge stanchion

3.10. SIDE STABILITY AND EASE OF EXCAVATION

The sides of the exploratory trial pit excavations appeared to be generally stable during excavation.

The presence of brick and concrete and the compacted nature of the Made Ground deposits meant that in certain places, excavation was slow through in some places. The natural strata was also excavated with some difficulty due to the very stiff and high strength of the CLAY.

4. TIER 2 QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT

E3P has undertaken a Tier 2 qualitative land risk assessment with respect to human health, controlled waters and ground gas to determine if any potential contaminants within the underlying soils and groundwater pose an unacceptable level of risk to the identified receptors.

4.1. DEVIATING SAMPLES

Best practice sampling procedures including the use of appropriate sampling containers and adhering to the laboratory holding times for each contaminant analysis, were undertaken in order to avoid samples being deviating.

4.2. SAMPLE ANALYSIS POPULATION

Table 10 summarises the chemical analysis testing scheduled from across the 2019 and 2024 investigation.

Table 10 Summary of Testing Schedule

TYPE OF SAMPLE	NO. OF SAMPLES	DETERMINANDS
Made Ground: Ash and Clinker	22	Speciated PAH
	24	pH, total metals, asbestos ID, TOC
	24	Speciated TPH
	9	Leachable metals
	2	SVOCs
	2	VOCS
	1	PCBS
Natural CLAY	16	Speciated PAH, total metals, banded TPH
	1	Leachable metals

4.3. HUMAN HEALTH RISK ASSESSMENT

At Tier 2 stage, the long term (chronic) human health toxicity of the soil has been assessed by comparing the on-site concentrations of organic and inorganic compounds with reference values published in LQM/CIEH S4UL (S4UL3267).

The Tier 2 screening values for residential with plant uptake have been utilised for this assessment due to the proposed development being a residential end use. To remain conservative at an early stage, the screening values based on a 1% SOM have been utilised for this assessment.

The results of the comparison have been summarised in Table 11.

Table 11 Summary of Inorganic and Hydrocarbon Toxicity Assessment for a Residential End Use (with plant uptake)

DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PL	ASSESSMENT
Arsenic	mg/kg	37	40	110 57 45 37	WS109 0.50m TP105 0.30m WS122 0.70m WS208 0.80m	1	Further Action
Cadmium	mg/kg	11	40	1.0	N/A	1	No Further Action
Chromium (VI)	mg/kg	6.0	40	<4.0 < 1.8	N/A	1	No Further Action
Lead	mg/kg	200	40	450 310	WS102 0.40m WS109 0.50m	1	Further Action
Mercury	mg/kg	1.2	40	0.40	N/A	4	No Further Action
Nickel	mg/kg	130	40	85	N/A	1	No Further Action

DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PL	ASSESSMENT
Selenium	mg/kg	250	40	4.5	N/A	1	No Further Action
Copper	mg/kg	2400	40	170	N/A	1	No Further Action
Zinc	mg/kg	3700	40	340	N/A	1	No Further Action
Cyanide – Total	mg/kg	791	40	< 1.0	N/A	1	No Further Action
Phenols – Total	mg/kg	120	35	< 1.0	N/A	1	No Further Action
Asbestos	Fibres	NFD	24	Amosite Chrysotile	WS101 0.20m (<0.001%) WS114 0.50m (<0.001%) TP205 0.50 m (<0.001%)	3	Further Action
Naphthalene	mg/kg	2.3	40	0.92	N/A	4	No Further Action
Acenaphthylene	mg/kg	170	40	0.45	N/A	2	No Further Action
Acenaphthene	mg/kg	210	40	2.1	N/A	1	No Further Action
Fluorene	mg/kg	170	40	2.2	N/A	1	No Further Action
Phenanthrene	mg/kg	95	40	14	N/A	2	No Further Action
Anthracene	mg/kg	2400	40	2.9	N/A	2	No Further Action
Fluoranthene	mg/kg	280	40	16	N/A	2	No Further Action
Pyrene	mg/kg	620	40	16	N/A	2	No Further Action
Benzo(a)Anthracene	mg/kg	7.2	40	9.8	WS112 2.10m	2	Further Action
Chrysene	mg/kg	15	40	6.4	N/A	2	No Further Action
Benzo(b)Fluoranthene	mg/kg	2.6	40	8.3	WS112 2.10m	2	Further Action
Benzo(k)Fluoranthene	mg/kg	77	40	2.9	N/A	2	No Further Action
Benzo(a)Pyrene	mg/kg	2.2	40	6.9 3.4	WS112 2.10m WS117 0.80m	2	Further Action
Indeno(123-cd)Pyrene	mg/kg	27	40	2.9	N/A	2	No Further Action
Dibenzo(a,h)Anthracene	mg/kg	0.24	40	1.1 0.45 0.31	WS112 2.10m WS117 0.80m TP216 2.00 m	2	Further Action
Benzo(ghi)Perylene	mg/kg	320	40	3.4	N/A	2	No Further Action
TPH C5-C6 (aliphatic)*	mg/kg	42	40	< 0.1	N/A	4	No Further Action
TPH C6-C8 (aliphatic)*	mg/kg	100	40	< 1.0	N/A	4	No Further Action
TPH C8-C10 (aliphatic)*	mg/kg	27	40	< 1.0	N/A	4	No Further Action
TPH C10-C12 (aromatic)*	mg/kg	74	40	36	N/A	4	No Further Action
TPH C12-C16 (aromatic)*	mg/kg	140	40	590 230	WS109 0.50m WS118 0.90m	4	Further Action
TPH C16-C21 (aromatic)*	mg/kg	260	40	760 340 300	WS109 0.50m WS118 0.90m WS122 0.70m	1	Further Action
TPH C21-C35 (aromatic)*	mg/kg	1100	40	1300	TP209 0.20m	1	Further Action

Notes
PL1 = soil ingestion, PL2 = dermal contact and ingestion, PL3 = dust inhalation; PL4 = Vapour/Gas Inhalation

Abbreviations: GAC = general assessment criteria, N = number of samples, MC = maximum concentration; Loc of Ex = location of exceedance; PL = Contaminant Pathway; NFD = no fibres detected.

The pathway noted in the table is the primary pathway, however it may not be the only pathway of that contaminant
* The Tier 2 GAC for the hydrocarbon fraction is derived from the CIEH assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. E3P has utilised the Tier 2 values for aliphatic compounds for the volatile and semi volatile fractions (C5-C12) and the Tier 2 values for aromatic compound for the non-volatile fractions (C12-C35). The comparison of a total (aliphatic/aromatic) compounds to an individual fraction is considered to be a conservative approach and satisfactory for the protection of human health.

Referring to Table 11, the results of this direct comparison indicate that the data exceeds the screening criteria for a residential end use for the following contaminants:

Inorganics

- Arsenic (Soil ingestion)
- Lead (Soil ingestion)
- Asbestos (Dust inhalation)

Organics

- Benzo(a)Anthracene (Dermal contact and ingestion)
- Benzo(b)Fluoranthene (Dermal contact and ingestion)
- Benzo(a)Pyrene (Dermal contact and ingestion)
- Dibenzo(a,h)Anthracene. (Dermal contact and ingestion)
- TPH C12-C16 (Vapour/Gas Inhalation)

- TPH C16-C21 (Dermal contact and ingestion)
- TPH C21-C35 (Dermal contact and ingestion)

The soil in TP115 was tested for PCBs due to the proximity to an electricity substation. No PCBs exceeding the GAC screening values were recorded.

No significant concentrations of VOCs or SVOCs were identified in the soils submitted for chemical analysis.

4.3.1. EXPOSURE PATHWAYS

The main exposure pathways based on the Tier 2 exceedances are:

- Soil ingestion (PL1);
- Consumption of homegrown vegetables (PL1);
- Dermal contact and ingestion (PL2);
- Fibre/dust inhalation (PL3); and
- Vapour inhalation (indoor) (PL4);

4.3.2. HUMAN HEALTH RISK ASSESSMENT AND MITIGATION

Heavy Metals, PAHs and Long Chain Hydrocarbons

Identified elevated concentrations of inorganic heavy metals (arsenic and lead), organic PAHs (dibenzo(a,h)anthracene, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene) and long chain hydrocarbons (TPH C16-C35) have primary exposure pathways related to dermal contact and

ingestion of soils (PL1 and PL2). The risk to chronic human health associated with the elevated concentrations on inorganic heavy metals, non-volatile PAH compounds and long chain hydrocarbons can be mitigated through the installation of a suitable cover system in all proposed private gardens, landscaping and public open space to remove any potential for direct exposure to impacted soils. Where hardstand is proposed (roads, plots and driveways) this will cut the contamination pathway and remove the risk to human health.

The specific design and installation process for the appropriate cover systems will be clearly defined within the site remediation and enabling works strategy.

Short Chain Hydrocarbons

With regards to the short chain aromatic TPHs C12-16, these present a potential volatilisation to indoor air risk. These elevated concentrations were encountered as isolated occurances within the shallow made ground soils (<1 m bgl) in two locations during the investigation in 2019. TPH C12-C16 impact has been identified within WS109 (south west) and WS118 (central) and is linked to parking locations of heavy goods vehicles (HGVs). Following the removal of the on-site source (HGVs) volatile TPH impact within these areas should be subject to delineation and further validation to assess chemical suitability for retention on site in an area of no future sensitivity or removal from site.

There is potential for on-site treatment of these soils under a suitable treatment permit, this would allow for a more sustainable cost-effective approach when compared to removal of soils to landfill. The suitability of treatment should be confirmed following further chemical validation at remediation and enabling works stage.

Asbestos

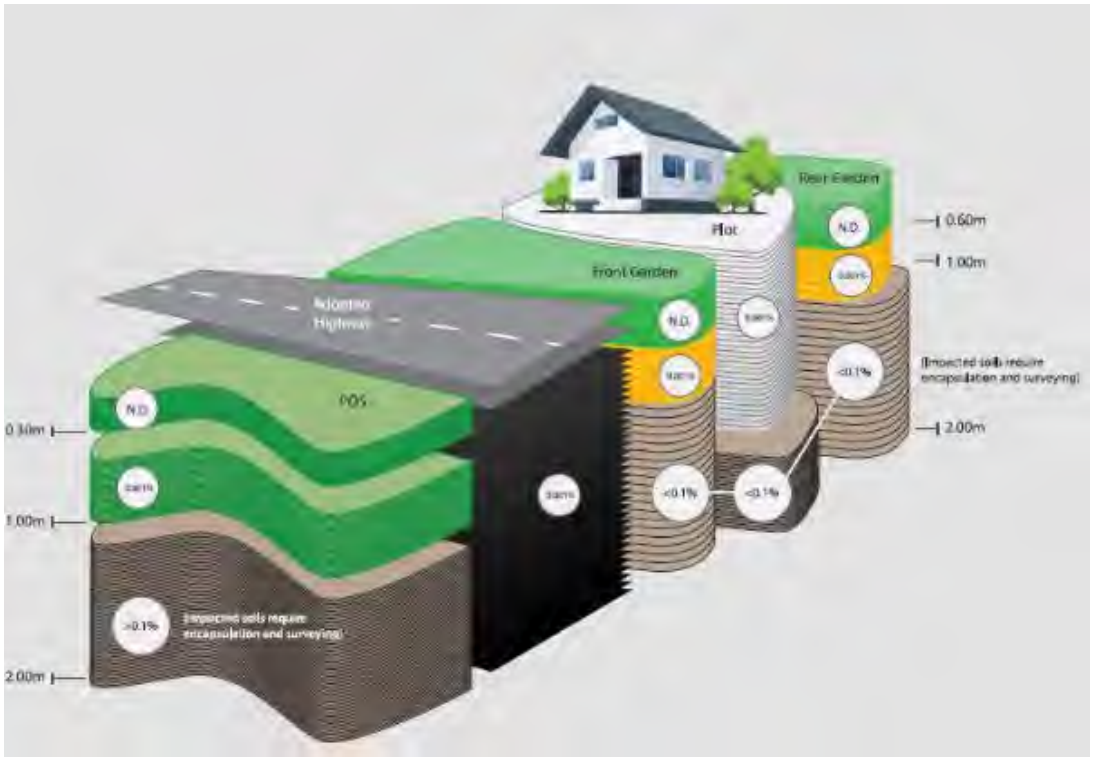
Asbestos in the form of loose amosite fibres has been identified in the granular Made Ground in TP205 at 0.50m bgl and in the previous site investigation in 2019 trace asbestos (loose chrysotile and amosite fibres) were identified within shallow Made Ground soils within WS101 and WS114 at 0.50m and 0.60m bgl. Quantification confirms asbestos to be present at trace amounts (<0.001%) in all locations.

Asbestos in the form of amosite has been identified within localised areas in shallow Made Ground deposits. Asbestos quantification should be undertaken to further assess where these soils can be placed.

No visual signs of ACM were encountered during the ground investigation; it is therefore likely that only trace fibres are present. However, due to the nature of the Made Ground and the age of the buildings on site having a likelihood of ACM within the building fabric, further sampling of soils will be required following the demolition of onsite buildings.

Impacted soils should be managed according to the asbestos risk mitigation conceptual site model shown in Figure 5.

Figure 5 Asbestos Risk Mitigation Conceptual Site Model



Notes
ND None Detect
0.001% Soils may contain ≤ 0.001% asbestos using composite testing to ensure there is no potential risk to human health. This value is present within areas where there may be a short term low level exposure of soils containing trace asbestos fibres by construction workers where an appropriate level of asbestos management is employed (dust suppression)
0.1% Soils at a depth of >1.00m bgl may contain <0.1% asbestos using composite testing where they will not be likely to be disturbed in the future and will therefore be in an area of low sensitivity. Risk assessment completed in accordance with Asbestos JIWG risk assessment tools.
Undefined- this will be dependent upon soils encountered during earthworks, which may be placed at these depths to ensure no potential risk to human health.

Chemical analysis of the natural clay drift deposits has identified these soils to be acceptable for use as subsoil within the proposed garden areas; however, further chemical validation samples will be required to meet regulatory sampling frequency.

There are no suitable sources of topsoil available on the site.

Asphalt

A sample of the asphalt hardstanding was submitted for coal tar and speciated PAH analysis. Chemical testing results did not identify coal tar within the sample submitted, however, elevated non-volatile PAH and volatile PAH (naphthalene) was recorded above human health screening values.

Given the absence of coal tar the material is suitable for use in aggregates in line with WRAP protocols. The specification of 6F2 material within method compaction highways 600 permits up to 20% asphalt, however, E3P recommends a maximum of 5% asphalt be utilised within crushed aggregates. Prior to placement of any site won crushed aggregates chemical validation should be undertaken to determine suitability for use. Given the elevated PAHs recorded, where site won asphalt is utilised with crushed aggregates, this material should be utilised beneath roads and driveways.

Should this material be removed from site, WM3 analysis should be undertaken to determine waste classification prior to removal.

Biological Pathogens

The former abattoir and meat wholesalers that operated within the central buildings may be a potential source of biological pathogens associated with the former slaughter of livestock and removal of animal wastes.

Liquid blood and fat waste that was not fully removed from the site or did not fully drain from the site, where present this is a potential source of harmful microorganisms if encountered by ground workers. There is a low likelihood that wastes leaked from tanks, pipework, and storage chambers through construction joints in floor slabs or through permeable surfaces, however, this cannot be discounted.

The risk of encountering pathogens associated with the former animal processing land use will lessen over time, therefore given the elapsed time period since the cessation of abattoir operations the risk is considered significantly reduced.

During the demolition of the former abattoir and meat wholesaler buildings, a watching brief should be implanted during the removal of any tanks, pits and pipework to identify any potentially blood or animal fat impacted soils.

4.4. CONTROLLED WATERS RISK ASSESSMENT

E3P has undertaken a controlled waters risk assessment for the site based on the consideration of the conceptual site model and the sensitive receptors which are summarised in Table 12.

Table 12 Controlled Waters Conceptual Model and Sensitivity Profile

DISCUSSION	SENSITIVITY RATING
Contaminant Source	
Made Ground (Infilled features) Made Ground across the site was noted to contain ash and occasional clinker, this is indicative of incinerated waste backfill, as was common at the time of the early to mid-20th century. The intrusive investigation has shown Made Ground to consist of both cohesive and granular deposits and so there are mixed levels of permeability within the strata. Soil analysis has identified elevated concentrations heavy metals (arsenic and lead), PAH (dibenzo(a,h)anthracene, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene) and long chain hydrocarbons (TPH C16-C35) in locations of previous level changes/infilled features.	**Low**
HGV Park The intrusive investigation has recorded TPH C12-C16 impact within WS109 (south west) and WS118 (central) in parking locations of heavy goods vehicles (HGVs). Additionally, elevated PAHs (dibenzo(a,h)anthracene, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene) have been recorded within parking areas of the HGVs.	**Low**
Brickworks The former brickworks is potential source of mobile contamination (heavy metals, PAH and TPH) within Made Ground in the west of the site. Soil analysis has not identified elevated concentrations of determinants tested.	**Low**
Tramway The historic tramway is potential source of mobile contamination (heavy metals, PAH and TPH). However, analysis of the soils in the area of the former tramway have not recorded elevated concentrations of determinants tested.	**Low**

DISCUSSION		SENSITIVITY RATING
Pathway		
Vertical Migration Due to the majority of the site being underlain by cohesive deposits in excess of 10m, vertical migration of contaminants is unlikely to occur as a result of the impermeability of the drift deposits. However, in the east of the site top of rockhead is encountered 5 m bgl with a principal bedrock aquifer recorded. Within this eastern portion of the site >3m of competent low permeability drift has been encountered that will limit the vertical migration towards this bedrock aquifer. The presence of this low permeability drift will offer protection to the underlying aquifer. Additionally, the risk of vertical migration is reduced given the absence of a consistent groundwater table and presence of hardstand across the site reducing rainwater ingress.		**Low/Moderate**
Lateral migration Lateral migration of contaminants is considered unlikely due to the presence of cohesive deposits across the site. However, given the presence of granular Made Ground across the site there is potential for lateral migration through this strata. The risk of this is reduced given the absence of a consistent groundwater table and presence of hardstand across the site reducing rainwater ingress.		**Low**
Receptor		
Aquifer Classification in Superficial Drift Deposits	Secondary (undifferentiated)	**Low/Medium**
Aquifer Classification in Bedrock	Principal aquifer (east) and Secondary A (west)	**High**
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is not located within a groundwater source protection zone or a drinking water safeguard zone.	**Low**
Distance to the Closest Groundwater Abstraction Point	There are no groundwater abstraction points within 500m of the site boundary. The nearest groundwater abstraction point is located 555m W, used for construction by Hanson Quarry Products Europe Limited.	**Low**
Is the Site Located Within 50 m of a Surface Watercourse?	The site is not located within 50 m of a surface watercourse. The closest surface water feature is the river Medlock located 56m south east of the site with a cemetery located between the site boundary and the watercourse.	**Low**

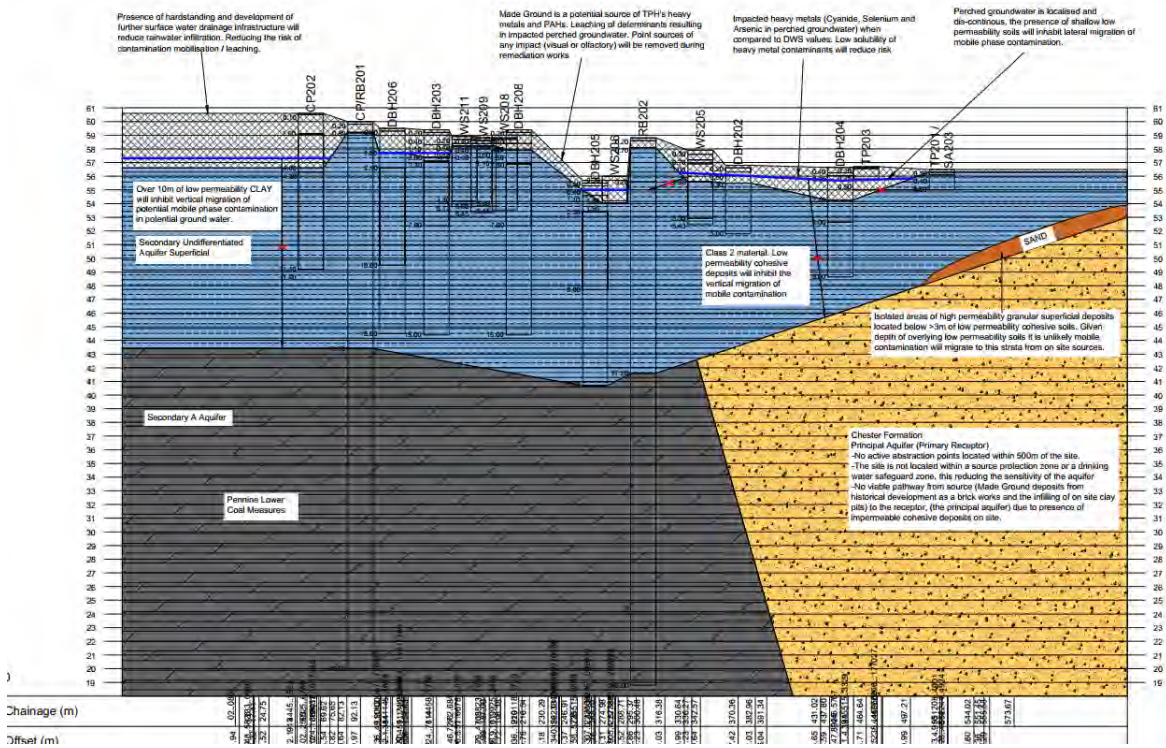
The ICSM developed within the context of the site setting has only identified a single viable pollutant pathway, which would be the downward migration of potentially mobile phase-soluble contaminants towards the underlying principal aquifer in the east of the site. However, the overall sensitivity of this receptor is reduced given the presence of low permeability deposits, lack of consistent groundwater table, presence of hardstand/surface water drainage infrastructure and absence of any groundwater abstraction thus the potential for the creation of a complete pollutant linkage.

Additionally, the underlying aquifer is considered to be of reduced sensitivity due to the proven depths of cohesive drift beneath the potentially mobile contamination in the Made Ground, the site not being within an SPZ and there being no recorded potable water abstraction points within 500 m of the site.

During the 2024 investigation, E3P installed deep groundwater monitoring wells, with response zones set at the base of Made Ground soils to target perched groundwater within the Made Ground.

In addition to above, E3P has developed a diagrammatic conceptual model which considers the factors in Table 1212. This is available as Drawing 17-246-010 and a snapshot is included in Figure 2.

Figure 2 Diagrammatic Conceptual Site Model (Controlled Waters)



The Tier 2 assessment, in line with LCRM (2023) has included a comparison of leachate analysis from samples of the Made Ground and groundwater samples to drinking water standards (DWS) and environmental quality standards (EQS). Table 13 includes site investigation data from 2019 and 2024 investigations.

Water samples were obtained utilising a bailer.

Table 13 Comparison of Groundwater and Leachate Analysis with Tier 2 Screening Levels

DETERMINANT	UNIT	EQS [1, 2] AA	DWS [3,4]	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
Arsenic	µg/l	50	10	5	19.9 11.6	WS101 DBH207	4	15 11	WS204 0.60m TP217 0.30m	**Further Action**
Cadmium	µg/l	0.08-0.25	5	5	0.06	N/A	4	<0.08	N/A	No Further Action
Chromium (VI)	µg/l	3.4	–	5	<5.0	N/A	4	19	WS104 0.60m	**Further Action**
Chromium (III)	µg/l	4.7	50	5	4.3	N/A	4	30	N/A	No Further Action
Copper	µg/l	1	2000	5	19 18 6.9 5.4 1.1	WS202 DBH209 CP202 WS209 DBH207	4	69	N/A	No Further Action
Total Cyanide	µg/l	1	50	5	150 29 4.8	WS209 DBH207 DBH209	4	1.6 1.2	WS208 WS204	**Further Action**
Lead	µg/l	1.2	10	5	2.8	DBH209	4	57	TP109 0.20m	**Further Action**
Mercury	µg/l	–	1.0	5	0.18	N/A	4	<0.5	N/A	No Further Action
Nickel	µg/l	4	20	5	12 8.6 4.1	DBH209 WS202 WS209	4	5.1	N/A	**Further Action**
Selenium	µg/l	–	10	5	59 54	WS209 DBH207	4	<4.0	N/A	**Further Action**
Zinc	µg/l	10.9	–	5	14	WS202	4	16	WS208 0.80m	**Further Action**
pH	6–9			5	12	DBH209	4	10.5-11.4	TP204 0.60m TP203 0.30m	**Further Action**

DETERMINANT	UNIT	EQS [1, 2] AA	DWS [3,4]	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
Polycyclic Aromatic Hydrocarbons										
Naphthalene	µg/l	2	10*	5	0.33	N/A	4	0.66	N/A	No Further Action
Anthracene	µg/l	0.1	10*	5	0.31 0.15	DBH209 DBH207	4	<0.01	N/A	**Further Action**
Benzo[b]fluoranthene	µg/l	0.00017 *	10*	5	0.82 0.68	DBH209 DBH207	4	<0.01	N/A	**Further Action**
Benzo[k]fluoranthene	µg/l	0.00017 *	10*	5	0.34 0.19	DBH209 DBH207	4	<0.01	N/A	**Further Action**
Benzo(a)pyrene	µg/l	0.00017 *	10*	5	0.74 0.56	DBH209 DBH207	4	<0.01	N/A	**Further Action**
Indeno(123-cd)pyrene	µg/l	0.00017 *	10*	5	0.4 0.27	DBH209 DBH207	4	<0.01	N/A	**Further Action**
Fluoranthene	µg/l	0.0063	10*	5	1.8 1.1	DBH209 DBH207	4	<0.01	N/A	**Further Action**
Benzo(ghi)perylene	µg/l	1.7–4	10*	5	0.49	N/A	4	<0.01	N/A	No Further Action
Aromatic Hydrocarbon										
TPH C5-C7 (benzene)	µg/l	10	1	5	<1.0	N/A	4	<3.0	N/A	No Further Action
TPH C7-C8 (toluene)	µg/l	74	700	5	<1.0	N/A	4	<3.0	N/A	No Further Action
TPH C8-C10 (xylene)	µg/l	30	300	5	<1.0	N/A	4	<3.0	N/A	No Further Action
TPH C10-C12 (naphthalene)	µg/l	2	90	5	<10	N/A	4	<10	N/A	No Further Action
TPH C12-C16	µg/l	–	90	5	16	N/A	4	<10	N/A	No Further Action
TPH C16-C35	µg/l	–	90	5	75	N/A	4	<10	N/A	No Further Action
Aliphatic Hydrocarbon										
TPH C5-C6	µg/l	–	1000[5]	5	<1.0	N/A	4	<1.0	N/A	No Further Action

DETERMINANT	UNIT	EQS [1, 2] AA	DWS [3,4]	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
TPH C6-C8	µg/l	–	1000[5]	5	<1.0	N/A	4	<1.0	N/A	No Further Action
TPH C8-C10	µg/l	–	300	5	<1.0	N/A	4	<1.0	N/A	No Further Action
TPH C10-C12	µg/l	–	300	5	<10	N/A	4	<10	N/A	No Further Action
TPH C12-C16	µg/l	–	300	5	<10	N/A	4	<10	N/A	No Further Action
TPH C16-C21	µg/l	–	300**	5	<10	N/A	4	<10	N/A	No Further Action
TPH C21-C35	µg/l	–	300**	5	<10	N/A	4	<10	N/A	No Further Action
Volatile Organic Compounds										
Tetrachloroethylene	µg/l	0.4	10	5	<3.0	N/A	-	-	N/A	No Further Action
Trichloroethylene	µg/l	10	10	5		N/A	-	-	N/A	No Further Action
Trichlorobenzene	µg/l	0.4	–	5		N/A	-	-	N/A	No Further Action
Trichloromethane	µg/l	2.5	–	5		N/A	-	-	N/A	No Further Action
Dichloromethane	µg/l	20	200	5		N/A	-	-	N/A	No Further Action
Carbon Tetrachloride	µg/l	12	3	5		N/A	-	-	N/A	No Further Action
Vinyl Chloride	µg/l	–	0.3	5		N/A	-	-	N/A	No Further Action

NOTES
SOLUBILITY <0.01µG/L
AA – ANNUAL AVERAGE
** POLYAROMATIC HYDROCARBONS (PAH) - BENZO(A)PYRENE (BAP), BENZO(B)FLUORANTHENE, BENZO(K)FLUORANTHENE, BENZO(G,H,I)-PERYLENE AND INDENO(1,2,3-CD)-PYRENE. BENZO(A)PYRENE CAN BE CONSIDERED AS A MARKER FOR THE OTHER PAHS, HENCE ONLY BENZO(A)PYRENE NEEDS TO BE MONITORED FOR COMPARISON WITH THE BIOTA EQS OR THE CORRESPONDING AA-EQS IN WATER*
*** THERE ARE NO WHO GUIDELINE VALUES FOR ALIPHATIC FRACTIONS C16-C21 AND C21-C35, THEREFORE THE GUIDELINE VALUE FOR ALIPHATIC FRACTIONS INCLUSIVE OF C8-C16 (300µG/L) HAS BEEN APPLIED.*

1. THE WATER FRAMEWORK DIRECTIVE (STANDARDS AND CLASSIFICATION) DIRECTIONS (ENGLAND AND WALES) 2015 (LEGISLATION.GOV.UK)
2. THE WATER SUPPLY (WATER QUALITY) REGULATIONS 2018 (LEGISLATION.GOV.UK)
3. GUIDELINES FOR DRINKING-WATER QUALITY, 4TH EDITION, INCORPORATING THE 1ST ADDENDUM (WHO.INT)
4. CL:AIRE PUBLISHES PETROLEUM HYDROCARBONS IN GROUNDWATER GUIDANCE (CLAIRE.CO.UK)
5. *A TOTAL TPH CRITERIA OF 1000 MG/KG WILL ACT AS A SURROGATE CRITERION FOR REMAINING ALIPHATIC AND AROMATIC TPH FRACTIONS.*

4.4.1. CONTROLLED WATER RISK ASSESSMENT AND MITIGATION

This comparison indicates that the data exceeds the EQS and DWS values for the following inorganic compounds:

Table 14 Summary of Controlled Waters Risk Assessment

EXCEEDANCE OF EQS	EXCEEDANCE OF DWS
Chromium VI (L)	Arsenic (L, GW)
Copper (L, GW)	Total Cyanide (GW)
Total Cyanide (L, GW)	Lead (L)
Lead (GW, L)	Selenium (GW)
Nickel (GW)	
Zinc (GW)	
Anthracene (GW)	
Benzo[b]fluoranthene (GW)	
Benzo[k]fluoranthene (GW)	
Benzo(a)pyrene (GW)	
Indeno(123-cd)pyrene (GW)	
Fluoranthene (GW)	

Notes: GW = Groundwater, L = Leachate

SVOC analysis from the groundwater samples also identified aniline, 2-Methylnaphthalene, Dibenzofuran, Carbazole and Anthraquinone above the laboratory LOD, within DBH209 located on the southern boundary of the site, however, no significant quantities of SVOC were identified (maximum 1.9 ug/l aniline).

The Tier 2 assessment shows there is a leachable potential within the shallow Made Ground soils at the site for a range of contaminants including heavy metals and PAHs. This is indicated by leachate sampling and several rounds of groundwater monitoring at the site with samples from wells installed within the Made Ground.

It should be noted that leaching tests were undertaken alongside groundwater testing. The leachate test is aggressive (de-ionised water) and is not in aqueous equilibrium (steady state) within the solid sample. This can cause rapid dissolution and overestimation of the aqueous phase concentrations compared to groundwater in contact with contaminated soils. Although dissolution can be reduced for highly hydrophobic contaminants, such as B(a)P it is likely that the initial leaching will remove the most readily available hydrocarbons and subsequent flushing would reduce the leachable concentrations.

The ICSM developed within the context of the site setting has only identified a single viable pollutant pathway, which would be the downward migration of potentially mobile phase-soluble contaminants towards the underlying principal aquifer in the east of the site. As such, a comparison of leachate and groundwater results against DWS exceedances has been made.

Contaminants have the theoretical potential to migrate vertically through the granular Made Ground if mobilised by perched groundwater. Marginally elevated heavy metals (arsenic, cyanide and selenium) have been identified in the perched groundwater at the site as shown by Table 12 and 13. All of the aforementioned heavy metals are considered to be associated with perched water confined within the Made Ground. Additionally, elevated lead concentrations in comparison to DWS were noted within leachate samples but not present within perched groundwater samples. The elevated concentrations of inorganic heavy metals is deemed to be associated with the historical site use as a brick works and the infilling of clay pits with incinerated (ashy) Made Ground to create a development platform.

4.4.2. DISCUSSION OF CONTROLLED WATERS RISK ASSESSMENT

Historically, the site has been subjected to extensive groundworks from the clay pit and several of industrial uses including a brick works, tramway and abattoir. Chemical by-products of manufacturing processes and compounds within the Made Ground is likely to have subsequently leached down into underlying ground and contaminated groundwater both within Made Ground and natural drift deposits.

During both phases of investigation no consistent groundwater table was encountered, however, high groundwater levels were encountered during the monitoring period, likely associated with pooling of surface water/perched groundwater within monitoring wells.

Heavy metal impact (cyanide, selenium and arsenic) above DWS has been recorded within the perched groundwater across the site, typically encountered at the base of Made Ground. Inorganic determinants identified above DWS are of a general low solubility and therefore low mobility, suggesting that the potential for migration towards a controlled water receptor is reduced.

The ground investigation has proven in excess of 10.00 m of firm medium strength to very stiff, very high-strength, low-permeability/impermeable CLAY soils underlying the Made Ground across the majority of the site where the impacted perched groundwater has been identified. However, in the east of the site top of bedrock is encountered from 5.50 m bgl with circa 3.00 m of low permeability clay cover present. The presence of >3.00 m (more widely >10.00 m) of low permeability clay cover will inhibit/impede the lateral and vertical migration of perched waters with potential dissolved phase impact, therefore offering protection to the underlying aquifer. Where granular deposits have been encountered (CP103 and CP105), granular high permeability deposits were encountered directly overlying the top of bedrock below sufficient clay cover.

Furthermore, the presence of hardstanding cover and surface drainage infrastructure across the site will reduce the amount of rainwater infiltration. This will result in fewer contaminants being mobilised and reduce the risk further to the underlying aquifer.

Given the lack of active groundwater abstraction recorded within 500m of the site, low permeability of the overlying drift limiting vertical migration and low solubilities and concentrations of heavy metals recorded, there is considered to be no unacceptable risk to controlled waters.

Based on the above, there is considered to be no significant level of risk to the controlled water receptors. However, due to the presence of heavy metals in the perched Made Ground, careful consideration as to the risks to site operatives and the possible requirement to pre-treat the water will be required.

4.5. GROUND GAS RISK ASSESSMENT

4.5.1. RATIONALE

Hazardous ground gas qualitative risk assessment is based on a conceptual site model (CSM) similar to that used for soil and groundwater contamination sources (i.e., source pathway receptor pollutant linkages).

The risk can be assessed based on knowledge of the ground conditions and CSM and a measure of hazardous gas concentrations and gas flow at the site within monitoring standpipes.

4.5.2. SOURCES AND PATHWAYS OF GROUND GAS

Table 15 summarises the potential sources and pathways of ground gas within the context of the recorded site setting and proposed development.

Table 15 Identified Potential Sources of Ground Gas

SOURCE
Made Ground Made Ground was encountered within all exploratory hole locations to a maximum unproven depth of 5.45 m bgl (WS112), however, typically Made Ground deposits were encountered at depths less than 1.00 m bgl. Generally, the Made Ground deposits on site comprised of asphalt across the majority of the site with concrete identified in the east within the warehouse and surrounding the building to a depth of 0.15m bgl. This was underlain by a black gravelly fine to medium sand with gravel of sandstone, mudstone and brick with fragments of concrete, clinker and ash inclusions. Deeper Made Ground deposits were encountered within the south west of the site, where the site is currently used as a lorry park. Made Ground within this area comprised of a reworked clay of soft to firm light grey mottled brown slightly sandy gravelly clay of sandstone, mudstone, coal and brick with fragments of timber and clinker, to a proven depth of 4.30m bgl within CP202. Within the west of the site former ponds/ditches are recorded. Putrescible pond bases are a low level gas source. Former pond bases should be removed as part of enabling works. Where putrescible material is present within Made Ground this is a source of hazardous ground gas. Made Ground encountered is largely ash, incinerated material with reduced potential to be a gas source. Additionally, given the age of the fill (>60 years) it is likely the majority of the gassing has already occurred, however, this will need to be confirmed.
Drift Strata The drift deposits are generally uniform across the site comprising a stiff to very stiff, high to very high strength, brown slightly gravelly sandy CLAY with gravel of sandstone and mudstone. No organic natural soils have been recorded. Drift deposits encountered across the site are low permeability and unlikely to be a major gas source.
Solid Strata The top of bedrock has been encountered on site between 5.50 m and 17.20 m bgl. The site is located within a Coal Mining Reporting Area. The Doctor coal seam enters the site from the northern boundary and was encountered (in-tact) within RB102 at 12.70 – 13.00 m bgl. Across two phases of intrusive investigation no evidence of coal mining has been identified. Given the lack of workings and presence of generally >10 m low permeability drift cover, the risk from hazardous gas from underground coal workings is considered to be low.
Landfill Sites A historical landfill is located 168m east of the site at Clayton Vale Power Station, known to dispose of inert, industrial, commercial, household, special and liquid sludge which was filled prior to 1974. Migration of gas from this landfill will be limited given the presence of low permeability drift across the site. However, further assessment is required to confirm this.

Other Gases

Radon mapping has identified the site is within an area not at risk from radon. Basic Radon mitigation measures are not required.

PAH analysis has identified levels above the laboratory limits of detection (LOD) throughout the site. However, TPH C12-C16 have been identified in two isolated locations. To prevent the risk from indoor vapours these soils should undergo delineation, excavation and further analysis.

The CIRIA C665 guidance on gas risk assessment includes recommendations for periods and frequencies for monitoring visits. These recommendations take into account the nature of the proposed development and the likely generation potential of the source.

The proposed development comprises private residential properties, which would be classified as a Type A development (high sensitivity) in accordance with BS8485:2015+A1:2019. However, it is considered that the likely generation potential of the identified gas sources (taking into account the likelihood of future increases in gas generation) would be best classified as low.

Therefore, within the context of the proposed residential end-use and ground gas generation potential, the gas assessment requires nine visits over six months, with at least two sets of readings at low or falling atmospheric pressure.

4.5.3. GROUND GAS RISK ASSESSMENT METHODOLOGY

The potential impact on the development from ground gases has been assessed with reference to standards and guidelines published in:

- CIRIA Report 665 – Assessing risks posed by hazardous ground gases to buildings (2007)
- BS8485:2015+A1:2019 – Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings

BS8485 provides guidance on the level of gas protection requirements based upon the characteristic situation (CS) and the proposed development based on building type.

Therefore, in accordance with BS8485, based on the measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) shall be derived for each monitoring point, from which the site characteristic hazardous gas flow rate (Q_{hgs}), and then the Characteristic Situation (CS) can be determined.

The following equation should be utilised:

$$Q_{hg} = q\left(\frac{C_{hg}}{100}\right)$$

Where:
q is the measured flow rate (in litres per hour) of combined gases from the monitoring standpipe
C_{hg} is the measured hazardous gas concentration (in percentage volume/volume).

The subsequent derived gas screening value (GSV) should be the maximum Q_{hg} (flow rate x concentration as a percentage volume) for all the monitoring events.

A 'worst case check' may be carried out using the maximum recorded flow in any hole with the maximum concentration in any hole to present the plausible worst case conditions. Adoption of the worst case Q_{hg} requires thorough justification and reference to the CSM.

The final derived GSV can then be used to characterise the site as summarised in Table 16.

Table 16 Site Characterisation by GSV (BS8485:2015)

CS	HAZARD POTENTIAL	GSV (L/HR) FOR METHANE AND CARBON DIOXIDE	ADDITIONAL FACTORS
CS1	Very Low	< 0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider an increase to CS2)
CS2	Low	< 0.70	Typical measured flow rate <70 l/h (otherwise consider an increase to CS3)
CS3	Moderate	< 3.5	N/A
CS4	Moderate to High	< 15	N/A
CS5	High	< 70	N/A
CS6	Very High	> 70	N/A

Notes

1) *The CS is equivalent to the characteristic GSV in CIRIA C665.*
2) *The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter should be considered.*
3) *Gas Screening Value is the Borehole Gas Volume Flow Rate, in litres per hour, multiplied by the concentration in the air stream of the particular gas being considered.*
4) *The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.*

It should be noted that in the first instance, this assessment has been carried out in accordance with BS8485:2015+A1(2019) and the thresholds given in CIRIA C665.

4.5.4. MONITORING METHODOLOGY

Concentrations of methane (CH_4), carbon dioxide (CO_2) and oxygen (O_2) (hydrogen sulphide) were measured using a calibrated infrared gas analyser (GFM435) with gas flow rates measured using an integrated flow meter.

Gas measurements were recorded for a minimum of 300 seconds (5 minutes) at each location, increasing to 600 seconds if elevated concentrations identified, at which point the maximum concentration of CH_4 and CO_2, together with the lowest concentration of O_2 were recorded.

The results of the ground gas monitoring are presented in Table 16.

In addition to the raw data, the results for each individual standpipe have been assessed with reference to guidance provided in BS8485:2015. Based on the initial peak measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) have been derived for each monitoring point, from which an individual Characteristic Situation (CS) can ultimately be determined.

4.5.5. SUMMARY OF MONITORING RESULTS

Table 17 presents of the ground gas and groundwater monitoring results from the 2019 program.

Table 18 presents of the 2024 ground gas and groundwater monitoring results to date.

Table 17 Summary of Ground Gas Monitoring Results 2019

WELL	DATE	CH_4 INITIAL (%V/V)	CH_4 STEADY (%V/V)	CH_4 GSV (l/hr)	CO_2 INITIAL (%V/V)	CO_2 STEADY (%V/V)	CO_2 GSV (l/hr)	O_2 (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
WS101	21/11/19	0.10	0.10	-0.01136	0.10	0.10	-0.01136	18.20	998	Falling	-11.36	0.50-3.00	4.09	0.52
	05/12/19	0.10	0.10	-0.0103	0.10	0.10	-0.0103	18.80	996	Falling	-10.30		4.10	0.44
	06/01/20	0.60	0.60	-0.06816	0.50	0.50	-0.0568	16.30	1005	Falling	-11.36		3.58	0.70
	24/01/20	0.20	0.20	-0.0202	0.40	0.40	-0.0404	17.10	1010	Falling	-10.10		3.60	0.74
	07/02/20	0.30	0.30	-0.0282	0.50	0.50	-0.047	16.90	1007	Falling	-9.40		3.62	0.71
	20/02/20	0.20	0.20	-0.0202	0.40	0.40	-0.0404	17.10	1002	Rising	-10.10		3.61	0.72
	06/03/20	0.20	0.20	-0.0174	0.50	0.50	-0.0435	17.20	998	Rising	-8.70		3.60	0.81
	23/03/20	0.30	0.30	-0.02223	0.40	0.40	-0.02964	17.40	1007	Falling	-7.41		3.60	0.89
	08/04/20	0.30	0.30	-0.03408	0.70	0.70	-0.07952	12.50	1017	Falling	-11.36		3.53	0.55
WS102	21/11/19	0.10	0.10	-0.01098	0.60	0.60	-0.06588	5.10	998	Falling	-10.98	0.50-4.00	Bung jammed in pipe.	
	5/12/19	0.10	0.10	-0.0094	0.50	0.50	-0.047	6.30	996	Falling	-9.40			
	06/01/20	0.10	0.10	-0.01098	0.40	0.40	-0.04392	3.30	1005	Falling	-10.98			
	24/01/20	0.10	0.10	-0.0113	0.50	0.50	-0.0565	4.60	1010	Falling	-11.30			
	07/02/20	0.10	0.10	-0.0103	0.30	0.30	-0.0309	6.90	1007	Falling	-10.30			
	20/02/20	0.10	0.10	-0.00997	0.20	0.20	-0.01994	7.40	1002	Rising	-9.97			
	06/03/20	0.10	0.10	-0.00971	0.40	0.40	-0.03884	4.90	998	Rising	-9.71			
	23/03/20	0.10	0.10	-0.0103	0.40	0.40	-0.0412	5.10	1007	Falling	-10.30			
	08/04/20	Monitoring well flooded.												
WS106	21/11/19	0.10	0.10	-0.00189	1.40	1.40	-0.02646	16.90	998	Falling	-1.89	0.50-3.00	2.96	0.47
	05/12/19	0.10	0.10	-0.00084	1.10	1.10	-0.00924	17.30	996	Falling	-0.84		2.95	0.43
	06/01/20	0.10	0.10	-0.00013	1.70	1.70	-0.00221	15.20	1005	Falling	-0.13		2.96	0.98
	24/01/20	0.10	0.10	0.00026	1.30	1.30	0.00338	16.30	1010	Falling	0.26		2.95	1.04
	07/02/20	0.10	0.10	-0.00026	1.50	1.50	-0.0039	16.80	1007	Falling	-0.26		2.94	1.10
	20/02/20	0.10	0.10	-0.00052	1.60	1.60	-0.00832	16.10	1002	Rising	-0.52		2.95	1.05
	06/03/20	0.10	0.10	-0.00013	1.40	1.40	-0.00182	16.90	998	Rising	-0.13		2.95	1.14
	23/03/20	0.10	0.10	0.00013	1.50	1.50	0.00195	16.60	1007	Falling	0.13		2.95	1.21
	08/04/20	0.10	0.10	0.0001	2.80	2.80	0.0028	8.90	1017	Falling	0.10		2.95	1.70
WS107	21/11/19	0.10	0.10	0.00079	0.80	0.80	0.00632	12.50	998	Falling	0.79	0.50-1.00	0.95	0.76
	05/12/19	0.10	0.10	0.00052	0.70	0.70	0.00364	13.20	996	Falling	0.52		0.94	0.71
	06/01/20	0.10	0.10	0.00154	0.60	0.60	0.00924	15.50	1007	Falling	1.54		0.94	0.69
	24/01/20	0.10	0.10	0.00088	0.50	0.50	0.0044	15.90	1010	Falling	0.88		0.93	0.74
	07/02/20	0.10	0.10	0.00102	0.60	0.60	0.00612	16.10	1007	Falling	1.02		0.94	0.77
	20/02/20	0.10	0.10	0.00174	0.50	0.50	0.0087	16.40	1002	Rising	1.74		0.95	0.81

WELL	DATE	CH_4 INITIAL (%V/V)	CH_4 STEADY (%V/V)	CH_4 GSV (l/hr)	CO_2 INITIAL (%V/V)	CO_2 STEADY (%V/V)	CO_2 GSV (l/hr)	O_2 (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
WS107	06/03/20	0.10	0.10	0.00098	0.80	0.80	0.00784	15.40	998	Rising	0.98	0.50-1.00	0.95	0.84
	23/03/20	0.10	0.10	0.00121	0.60	0.60	0.00726	16.30	1007	Falling	1.21		0.94	0.85
	08/04/20	0.10	0.10	0.00202	0.50	0.50	0.0101	17.70	1017	Falling	2.02		0.92	0.69
WS108	21/11/19	0.10	0.10	0.00088	0.10	0.10	0.00088	20.30	998	Falling	0.88	0.50-1.00	1.16	0.55
	05/12/19	0.10	0.10	0.00074	0.10	0.10	0.00074	20.20	996	Falling	0.74		1.15	0.50
	06/01/20	0.10	0.10	0.00812	0.40	0.40	0.03248	17.30	1007	Falling	8.12		1.13	0.47
	24/01/20	0.10	0.10	0.00721	0.30	0.30	0.02163	18.10	1010	Falling	7.21		1.14	0.56
	07/02/20	0.10	0.10	0.0069	0.20	0.20	0.0138	19.20	1007	Falling	6.90		1.14	0.51
	20/02/20	0.10	0.10	0.00541	0.20	0.20	0.01082	19.30	1002	Rising	5.41		1.15	0.49
	06/03/20	0.10	0.10	0.00478	0.30	0.30	0.01434	19.20	998	Rising	4.78		1.15	0.42
	23/03/20	0.10	0.10	0.0029	0.40	0.40	0.0116	19.10	1007	Falling	2.90		1.15	0.51
	08/04/20	0.10	0.10	0.00945	0.50	0.50	0.04725	17.10	1017	Falling	9.45		1.15	0.55
WS109	21/11/19	0.10	0.10	0.00026	0.20	0.20	0.00052	20.20	998	Falling	0.26	0.50-2.00	1.95	1.44
	05/12/19	0.10	0.10	0.00052	0.30	0.30	0.00156	20.10	996	Falling	0.52		1.96	1.40
	06/01/20	0.10	0.10	0.00085	2.20	2.20	0.0187	7.80	1007	Falling	0.85		1.96	1.50
	24/01/20	0.10	0.10	0.00026	1.90	1.90	0.00494	10.40	1010	Falling	0.26		1.95	1.47
	07/02/20	0.10	0.10	0.00052	2.10	2.10	0.01092	9.40	1007	Falling	0.52		1.95	1.43
	20/02/20	0.10	0.10	0.00026	1.80	1.80	0.00468	10.30	1002	Rising	0.26		1.94	1.50
	06/03/20	0.10	0.10	0.00013	2.20	2.20	0.00286	8.90	998	Rising	0.13		1.94	1.54
	23/03/20	0.10	0.10	0.00052	1.90	1.90	0.00988	10.10	1007	Falling	0.52		1.94	1.60
	08/04/20	Monitoring well could not be accessed.												
WS111	21/11/19	0.10	0.10	0.00459	0.10	0.10	0.00459	20.20	998	Falling	4.59	1.00-3.00	2.97	GL
	05/12/19	0.10	0.10	0.0029	0.10	0.10	0.0029	20.30	996	Falling	2.90		2.96	GL
	06/01/20	0.10	0.10	-0.00835	0.90	0.90	-0.07515	15.40	1007	Falling	-8.35		2.96	0.40
	24/01/20	0.10	0.10	-0.00741	0.70	0.70	-0.05187	16.40	1010	Falling	-7.41		2.95	0.45
	07/02/20	0.10	0.10	-0.0069	0.60	0.60	-0.0414	17.10	1007	Falling	-6.90		2.95	0.36
	20/02/20	0.10	0.10	-0.0054	0.60	0.60	-0.0324	16.90	1002	Rising	-5.40		2.96	0.40
	06/03/20	0.10	0.10	-0.0047	0.80	0.80	-0.0376	16.7	998	Rising	-4.70		2.96	0.49
	23/03/20	0.10	0.10	-0.00671	0.70	0.70	-0.04697	16.70	1007	Falling	-6.71		2.95	0.59
	08/04/20	0.10	0.10	0.00474	1.40	1.40	0.06636	8.00	1017	Falling	4.74		2.96	0.35
WS112	21/11/19	0.10	0.10	0.00079	2.00	2.00	0.0158	2.70	998	Falling	0.79	0.50-4.00	3.66	2.23
	05/12/19	0.10	0.10	0.00052	1.80	1.80	0.00936	3.90	996	Falling	0.52		3.65	2.21
	06/01/20	0.10	0.10	0.0001	2.00	2.00	0.002	1.10	1007	Falling	0.10		3.64	2.45
	24/01/20	0.10	0.10	0.00013	1.70	1.70	0.00221	2.50	1010	Falling	0.13		3.64	2.51

WELL	DATE	CH_4 INITIAL (%V/V)	CH_4 STEADY (%V/V)	CH_4 GSV (l/hr)	CO_2 INITIAL (%V/V)	CO_2 STEADY (%V/V)	CO_2 GSV (l/hr)	O_2 (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
	07/02/20	0.10	0.10	0.00026	1.80	1.80	0.00468	2.10	1007	Falling	0.26		3.64	2.42
	20/02/20	0.10	0.10	0.00013	1.90	1.90	0.00247	1.90	1002	Rising	0.13		3.62	0.10
	06/03/20	0.10	0.10	0.00052	1.70	1.70	0.00884	2.40	998	Rising	0.52		3.61	0.19
	23/03/20	0.10	0.10	0.00026	1.90	1.90	0.00494	2.10	1007	Falling	0.26		3.61	0.39
	08/04/20	0.10	0.10	0.0001	1.80	1.80	0.0018	1.30	1017	Falling	0.10		3.63	2.62
WS114	21/11/20	Monitoring well flooded.										0.50-3.00		
	05/12/20													
	06/01/20	0.10	0.10	-0.00406	0.10	0.10	-0.00406	20.50	1007	Falling	-4.06		2.67	GL
	24/01/20	0.10	0.10	-0.0037	0.20	0.20	-0.0074	20.40	1010	Falling	-3.70		2.68	0.10
	07/02/20	0.10	0.10	-0.0029	0.20	0.20	-0.0058	20.30	1007	Falling	-2.90		2.67	0.10
	20/02/20	0.10	0.10	-0.00341	0.20	0.20	-0.00682	20.10	1002	Rising	-3.41		2.66	0.10
	06/03/20	0.10	0.10	-0.0027	0.30	0.30	-0.0081	20.20	998	Rising	-2.70		2.66	0.15
	23/03/20	0.10	0.10	-0.0036	0.20	0.20	-0.0072	20.10	1007	Falling	-3.60		2.65	0.31
	08/04/20	0.10	0.10	0.0021	0.10	0.10	0.0021	20.80	1017	Falling	2.10		2.63	0.26
WS117	21/11/19	0.10	0.10	0.0001	0.10	0.10	0.0001	19.10	998	Falling	0.10	0.50-3.00	2.85	0.88
	5/12/19	0.10	0.10	0.00013	0.10	0.10	0.00013	18.90	996	Falling	0.13		2.85	0.83
	6/1/20	0.10	0.10	0.00258	0.20	0.10	0.00516	20.20	1007	Falling	2.58		2.73	0.76
	24/1/20	0.10	0.10	0.00196	0.20	0.20	0.00392	20.10	1010	Falling	1.96		2.75	0.81
	7/2/2020	0.10	0.10	0.0021	0.20	0.20	0.0042	20.20	1007	Falling	2.10		2.72	0.73
	20/2/20	0.10	0.10	0.00192	0.10	0.10	0.00192	20.30	1002	Rising	1.92		2.73	0.75
	6/3/20	0.10	0.10	0.00224	0.20	0.20	0.00448	20.10	998	Rising	2.24		2.72	0.80
	23/3/20	0.10	0.10	0.00184	0.20	0.20	0.00368	20.20	1007	Falling	1.84		2.72	0.94
	8/4/20	0.10	0.10	0.00552	0.40	0.40	0.02208	4.30	1017	Falling	5.52		2.58	0.78
WS118	21/11/19	0.10	0.10	-0.00174	0.70	0.70	-0.01218	15.70	998	Falling	-1.74	0.50-3.50	3.00	0.54
	05/12/19	0.10	0.10	-0.00088	0.60	0.60	-0.00528	15.90	996	Falling	-0.88		3.00	0.51
	06/01/20	0.10	0.10	0.0001	0.70	0.70	0.0007	14.80	1005	Falling	0.10		3.00	0.55
	24/01/20	0.10	0.10	0.00026	0.50	0.50	0.0013	16.10	1010	Falling	0.26		3.00	0.59
	07/02/20	0.10	0.10	0.00052	0.40	0.40	0.00208	15.80	1007	Falling	0.52		3.00	0.52
	20/02/20	0.10	0.10	0.00013	0.50	0.50	0.00065	15.10	1002	Rising	0.13		2.99	0.48
	06/03/20	0.10	0.10	0.00026	0.60	0.60	0.00156	15.20	998	Rising	0.26		3.00	0.54
	23/03/20	0.10	0.10	0.00052	0.60	0.60	0.00312	14.90	1007	Falling	0.52		3.00	0.62
	08/04/20	0.10	0.10	0.00317	0.30	0.30	0.00951	20.90	1017	Falling	3.17		1.90	0.52
WS119	21/11/19	0.10	0.10	0.00013	0.60	0.60	0.00078	19.80	998	Falling	0.13	0.50-1.00	Bung jammed in pipe.	
	05/12/19	0.10	0.10	0.00026	0.50	0.50	0.0013	19.90	996	Falling	0.26			

WELL	DATE	CH_4 INITIAL (%V/V)	CH_4 STEADY (%V/V)	CH_4 GSV (l/hr)	CO_2 INITIAL (%V/V)	CO_2 STEADY (%V/V)	CO_2 GSV (l/hr)	O_2 (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
	06/01/20	Monitoring well destroyed.												
	24/01/20													
	07/02/20													
	20/02/20													
	06/03/20													
	23/03/20													
	08/04/20													
WS121	21/11/19	0.10	0.10	0.0001	0.10	0.10	0.0001	19.80	998	Falling	0.10	0.50-1.50	1.43	0.93
	05/12/19	0.10	0.10	0.00013	0.20	0.20	0.00026	19.70	996	Falling	0.13		1.42	0.89
	06/01/20	0.10	0.10	0.00013	0.10	0.10	0.00013	20.40	1007	Falling	0.13		1.35	0.43
	24/01/20	0.10	0.10	0.00026	0.20	0.20	0.00052	20.10	1010	Falling	0.26		1.36	0.51
WS121	07/02/20	0.10	0.10	0.00052	0.20	0.20	0.00104	20.2	1007	Falling	0.52	0.50-1.50	1.35	0.54
	20/02/20	0.10	0.10	0.00026	0.30	0.30	0.00078	20.10	1002	Rising	0.26		1.36	0.49
	06/03/20	0.10	0.10	0.00013	0.20	0.20	0.00026	19.90	998	Rising	0.13		1.35	0.57
	23/03/20	0.10	0.10	0.00026	0.40	0.40	0.00104	19.80	1007	Falling	0.26		1.35	0.65
	08/04/20	0.10	0.10	0.00013	0.10	0.10	0.00013	20.80	1017	Falling	0.13		1.33	0.50
	21/11/19	0.10	0.10	-0.00079	0.10	0.10	-0.00079	18.60	994	Falling	-0.79		1.52	0.56
	05/12/19	0.10	0.10	-0.00026	0.10	0.10	-0.00026	18.90	996	Falling	-0.26		1.52	0.52
	06/01/20	0.10	0.10	0.00933	0.10	0.10	0.00933	20.10	1007	Falling	9.33		1.42	0.32
	24/01/20	0.10	0.10	0.00674	0.10	0.10	0.00674	20.20	1010	Falling	6.74		1.43	0.36
WS122	07/02/20	0.10	0.10	0.00593	0.10	0.10	0.00593	20.10	1007	Falling	5.93	0.50-1.50	1.43	0.40
	20/02/20	0.10	0.10	0.0051	0.20	0.20	0.0102	19.90	1002	Rising	5.10		1.44	0.38
	06/03/20	0.10	0.10	0.00489	0.20	0.20	0.00978	20.20	998	Rising	4.89		1.44	0.44
	23/03/20	0.10	0.10	0.0054	0.20	0.20	0.0108	20.10	1007	Falling	5.40		1.43	0.51
	08/04/20	0.10	0.10	0.00528	0.20	0.20	0.01056	15.10	1017	Falling	5.28		1.43	0.51

Table 18 Summary of Ground Gas Monitoring Results 2024

WELL	DATE	CH_4 INITIAL (%V/V)	CH_4 STEADY (%V/V)	CH_4 GSV (l/hr)	CO_2 INITIAL (%V/V)	CO_2 STEADY (%V/V)	CO_2 GSV (l/hr)	O_2 (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
WS201	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1023	Falling	0.10	1.00–2.00	2.00	Dry
	26/02/24	0.1	0.1	0.0001	2.1	2.1	0.0021	14.5	1009	Rising	0.10		1.97	Dry
	18/03/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1004	Steady	0.10		2.00	Dry
WS202	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1025	Falling	0.10	1.00–3.00	2.85	1.20
	26/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.5	1007	Rising	0.10		2.82	1.25
	18/03/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1004	Steady	0.10		2.85	1.15
WS203	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1024	Falling	0.10	0.50–1.50	1.55	1.41
	26/02/24	0.1	0.5	0.0005	0.1	0.5	0.0005	19.9	1007	Rising	0.10		1.52	1.35
	18/03/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1004	Steady	0.10		1.55	1.30
WS205	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	2023	Falling	0.10	1.00–2.00	1.95	1.85
	26/02/24	0.1	0.1	0.0001	1.3	1.3	0.0013	16.4	1009	Rising	0.10		1.92	1.57
	18/03/24	0.1	0.1	0.0001	1.5	1.6	0.0016	16.4	1004	Steady	0.10		1.95	1.50
WS207	01/02/24	Could not be located												
	26/02/24													
	18/03/24													
WS209	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1023	Falling	0.10	1.00–4.00	3.90	1.90
	26/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.4	1008	Rising	0.10		3.90	0.80
	18/03/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1005	Steady	0.10		3.90	1.80
WS210	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1023	Falling	0.10	0.50–1.00	0.95	0.60
	26/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	1007	Rising	0.10		0.92	0.60
	18/03/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1004	Steady	0.10		0.95	0.65
WS211	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1023	Falling	0.10	1.00–4.50	3.42	0.45
	26/02/24	0.1	0.1	0.0021	0.3	0.2	0.0063	20	1008	Rising	0.10		3.40	0.25
	18/03/24	0.1	0.1	0.0001	0.7	0.7	0.0007	15.9	1004	Steady	0.10		3.40	0.35
DBH203	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1022	Falling	0.10	0.50–1.00	1.20	0.40
	26/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1007	Rising	0.10		1.18	0.16
	18/03/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1004	Steady	0.10		1.20	0.10
DBH205	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1023	Falling	0.10	0.50–1.00	0.80	0.50
	26/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	1008	Rising	0.10		0.86	0.30
	18/03/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1004	Steady	0.10		0.80	0.20

WELL	DATE	CH_4 INITIAL (%V/V)	CH_4 STEADY (%V/V)	CH_4 GSV (l/hr)	CO_2 INITIAL (%V/V)	CO_2 STEADY (%V/V)	CO_2 GSV (l/hr)	O_2 (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
DBH207	01/02/24	0.1	0.1	0.0001	0.2	0.1	0.0002	20.2	1022	Falling	0.10	1.00–2.60	1.58	0.90
	26/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	18.9	1008	Rising	0.10		1.58	0.58
	18/03/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	1004	Steady	0.10		1.55	0.50
CP202	01/02/24	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1022	Falling	0.10	1.00–4.30	4.15	1.05
	26/02/24	0.1	0.1	0.0000	0.1	0.1	0.0001	20.1	1007	Rising	0.10		3.17	0.80
	18/03/24	0.1	0.1	0.0000	0.1	0.1	0.0001	20.2	1004	Steady	0.10		4.15	0.90

4.5.6. GROUNDWATER

Monitoring well WS111, WS114 and WS123 were flooded throughout the monitoring visits and therefore these locations have not been included within the 2019 gas assessment.

Monitoring wells WS102, WS119, WS125, CP202 have not been included within the gas assessment due to the monitoring wells being damaged or inaccessible.

Within the remaining wells, groundwater levels were observed to fluctuate over the monitoring period during the 2019 gas monitoring program, with levels generally decreasing in the western area and increasing in the eastern area of the site over the monitoring period. The greatest groundwater change occurred within WS121 where levels increased by 0.43 m over the monitoring period. WS121 was set within a low-permeability clay stratum and groundwater is likely to be a result of surface water collecting in the well rather than a measure of true groundwater.

During the 2024 monitoring program, wells WS211, DBH203, DBH205, DBH207 and CP2002 were flooded throughout the monitoring visits and therefore these locations have not been included within the gas assessment.

Monitoring well WS209 was flooded on one of three monitoring visits and therefore this visit has not been included within the gas assessment.

Monitoring well WS207 has not been included within the gas assessment due to the monitoring wells being damaged or inaccessible.

Within the remaining wells, groundwater levels were observed to fluctuate over the 2024 monitoring period to date, with levels generally decreasing over the monitoring period. WS202, WS207, WS209 and WS211 were set within low-permeability clay stratum and groundwater is likely to be a result of surface water collecting in the well rather than a measure of true groundwater. Remaining wells were set within a mixture of granular and cohesive Made Ground, it is likely that groundwater within these locations is representative of pooling within wells (where cohesive soils are present) and perched groundwater where granular Made Ground is recorded.

4.5.7. BAROMETRIC PRESSURE

Visits 1 and 2 were undertaken during a period of relatively high/stable pressure, with pressure recorded to be between 1022 and 1025 and 1007 m bar.

4.5.8. GAS FLOW

During the 2019 monitoring regime, a positive flow was noted in WS107, WS108, WS109, WS112, WS117, WS119 and WS121. The measure of positive flow is considered to be the result of groundwater fluctuations and flooding of the well causing compression – as opposed to gas generation – as the highest flows are recorded during periods of high groundwater levels.

Negative flows are potentially indicative of back pressure from wind being greater than the active flow from the wells. Negative flows were recorded in WS101, WS102, WS106, WS111, WS114, WS118 and WS122.

Throughout the 2024 monitoring period, flow rates were recorded to be 0.1 l/hr (limit of detection of the analyser).

4.5.9. GAS CONCENTRATIONS

During the 2019 monitoring program, methane has been recorded within monitoring well WS101 at concentrations of 0.20% v/v to 0.60% v/v. No elevated concentrations were recorded within any of the remaining monitoring wells.

Carbon dioxide concentrations were recorded within all the monitoring wells at concentrations ranging from 0.10% v/v to 2.80% v/v (WS106). The maximum carbon dioxide levels were also associated with low oxygen concentrations and Made Ground deposits.

During the 2024 program, the maximum methane concentrations were recorded at concentrations ranging from 0.1% v/v to 0.5% v/v (WS205). Carbon dioxide concentrations were recorded at concentrations ranging from 0.1% v/v to 2.1% v/v (WS201).

4.5.10. RADON RISK

UK Radon indicates the site is situated in an area where 3-5% of homes are above the "Action Level". As such, a BGS Radon Report was obtained for the site (ref: BGS_337047/52150).

the report summarised that the property is in an area where less than 1% of homes are estimated to be at or above the action level. As such, basic radon protective measures are not necessary for the construction of new dwellings or extensions.

4.5.11. CONCLUSION

The determined Characteristic Situation for each standpipe for each visit is presented in Table 19. This indicates that based on the peak flow rates the majority of the monitoring visits classify as Characteristic Situation (CS)1 – Very Low Gas Risk.

Table 19 Gas Risk Profile and Location

WELL	DEPTH TO WATER (m bgl)	MAX FLOW (l/hr)	MAX CH_4 (%V/V)	MAX CH_4 Q_{hg} (l/hr)	MAX CO_2 (%V/V)	MAX CO_2 Q_{hg} (l/hr)	CHARACTERISTIC SITUATION
WS101	0.70	-11.36	0.60	0.0681	0.70	0.0795	CS2
WS106	1.04	-0.52	0.10	0.00052	2.80	0.0145	CS1
WS107	0.71	0.1	0.10	0.0001	0.80	0.0008	CS1
WS108	0.56	9.45	0.10	0.00945	0.50	0.0472	CS1
WS109	1.50	0.85	0.10	0.00085	2.20	0.0187	CS1
WS112	2.21	0.79	0.10	0.00079	2.00	0.0158	CS1
WS117	2.10	0.73	0.10	0.00073	0.40	0.00292	CS1
WS118	0.55	1.72	0.10	0.00172	0.70	0.01204	CS1
WS121	0.93	0.52	0.10	0.00052	0.40	0.00208	CS1
WS122	0.56	0.79	0.10	0.00079	0.20	0.000158	CS1
WS201	Dry	0.1	0.1	0.0001	2.10	0.0021	CS1
WS202	1.20	0.1	0.1	0.0001	0.10	0.0001	CS1
WS203	1.30	0.1	0.5	0.0005	0.50	0.0005	CS1
WS205	1.50	0.1	0.1	0.0001	1.60	0.0016	CS1
WS209	1.80	0.1	0.1	0.0001	0.10	0.0001	CS1
WS210	0.60	0.1	0.1	0.0001	0.10	0.0001	CS1
WS211							
DBH203							
DBH205							
DBH207							
CP202							

Wells Flooded

Gas monitoring from the 2019 investigation included the following conclusions;

- Ground gas monitoring suggests that the majority of the site can be classified as CS1, and in these areas, it is considered that gas protection measures will not be required.
- In the vicinity of WS101 carbon dioxide has been identified above the 0.07 l/h Qhg threshold, resulting in a CS2 classification.
- E3P recommends the source of the gas be investigated further, targeted for removal, and re-monitored for the purpose of decreasing the overall site to CS1.

Gas monitoring from the 2024 program undertaken to date suggests the site can be classified as CS1.

The site CSM has not identified any significant or persistent potential sources of hazardous ground gas, therefore, it is likely that the majority of the site will be classified as CS1.

In the west, the former infilled ponds and stream channel has the potential to represent a low-level ground gas source. Furthermore, WS101 located on the southern boundary has identified elevated CO_2. It is therefore recommended that CS2 measures be allowed in these sectors until the final ground gas risk assessment and site CSM are refined.

4.6. POTABLE WATER SUPPLY

This section provides a summary of the site investigation data with reference to the selection of potable water supply pipework. The assessment is made with reference to the UK Water Industry Research (UKWIR) publication "Guidance on the selection of Water Supply Pipes to be used in Brownfield Sites"

Table 20 Pipeline Selection PE Threshold Concentrations

CONTAMINANT GROUP	PE-THRESHOLD (MG/KG)	CONCENTRATIONS AT CURRENT PIPELINE DEPTH (MG/KG)
Total VOC	0.5	<1.0
Total BTEX And MTBE	0.1	N/A
Total SVOCs (Excluding PAH and those substances marked with an *)	2	N/A
EC5-EC10 Aliphatic and Aromatic Hydrocarbons	2	<1.0
EC10-EC16- Aliphatic and Aromatic Hydrocarbons	10	8.7
EC16-EC40 Aliphatic and Aromatic Hydrocarbons	500	175
Phenols (From SVOC Analysis)*	2	N/A
Cresols and Chlorinated Phenols (From SVOC Analysis)	2	NA
Ethers*	0.5	NA
Nitrobenzene*	0.5	NA
Ketones*	0.5	NA
Aldehydes*	0.5	NA
Amines	Fail	NA
Other Consideration		
Are there any exceedances of the PE threshold outside of the pipeline depth?	Exceedances of EC10-EC16 Aliphatic and Aromatic Hydrocarbons have been identified above the pipeline threshold within TP205 and TP209 within shallow Made Ground deposits.	

CONTAMINANT GROUP	PE-THRESHOLD (MG/KG)	CONCENTRATIONS AT CURRENT PIPELINE DEPTH (MG/KG)
	Exceedances of EC16-EC40 Aliphatic and Aromatic Hydrocarbons have been identified above the pipeline threshold within TP209 and TP211 within shallow Made Ground deposits.	
Is free product present in soil and groundwater?	None	
Could hydrocarbon impact at greater depth than current pipeline depth be mobilised by rising groundwater levels?	Yes- Heavy end hydrocarbon impact and low solubility PAH has been identified within Made Ground.	
Will soils impacted with above determinands likely be utilised elsewhere on site?	No	
Will soils be imported to site as part of any future earth works	Currently unknown, however it is unlikely soils will be required to be imported to site.	

Notes - Pipe line depth normally between 0.75m–1.35m

Based on the assessment of current site conditions it is likely that barrier pipe will be required at the proposed development. This echoes what was found in the 2019 investigation with exceedances of EC10-EC16 and EC16-EC40 Aliphatic and Aromatic Hydrocarbons at pipeline depth.

4.7. DEVELOPED CONCEPTUAL SITE MODEL

Following the completion of the intrusive site investigation, chemical analysis, and risk assessment, the conceptual model shown in Table 20 was prepared for the site.

Table 21 Developed Conceptual Model

HUMAN HEALTH						
CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	MIGRATION PATHWAYS	RECEPTORS				
SOIL						
Made Ground, Historical Brick Works, Infilled Features and Current Commercial Activities Heavy Metals, PAHs, long chain TPHs	Accidental ingestion and/or dermal contact with contaminated soil and/or leachate. **PL1/PL2**	Human Health – construction workers	Likely	Medium	The ICSM and soil testing has identified heavy metals, non volatile PAH and long chain TPH (C16-C35) above assessment criteria. Site personnel have a greater chance of coming into contact with contaminated soils. Particularly during excavation and soil recovery works. **Recommendation:** Construction works to be completed with appropriate PPE and welfare facilities.	Low
		Human Health – end users	Likely	Medium	**Recommendation:** Cover system to garden and landscaped areas will prevent exposure to future site users.	Very low

CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	**MIGRATION PATHWAYS**	**RECEPTORS**				
Former abattoir and meat wholesalers. Biological pathogens	Accidental ingestion and/or dermal contact **PL1/PL2**	Human Health – construction workers	Low likelihood	Medium	The former abattoir and meat wholesalers that operated within the central buildings is a potential source of biological pathogens associated with the former slaughter of livestock and removal of animal wastes. The risk of encountering pathogens associated with the former animal processing land use will lessen over time, therefore given the elapsed time period since the cessation of abattoir operations the risk is considered significantly reduced. **Recommendation:** Construction works to be completed with appropriate PPE and welfare facilities.	Low
		Human Health – end users	Low likelihood	Medium	**Recommendation:** During the demolition of the former abattoir and meat wholesaler buildings, a watching brief should be implanted during the removal of any tanks or pipework to identify any potentially blood or animal fat impacted soils.	Very Low

CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	**MIGRATION PATHWAYS**	**RECEPTORS**				
Made Ground and Current/Former Structures Asbestos (Asbestos containing materials (ACM) and loose fibres)	Inhalation (of fibres). Construction works disturbing bound material and releasing fibres. **PL3**	Human Health – construction workers, end land users, and users of adjacent sites	Likely	High	Trace asbestos has been recorded within Made Ground across the site. ACM poses a risk through fibre and dust inhalation and if present poses a risk to construction workers during any future earthworks / demolition and to adjacent third-party property should dust be generated during those works. **Recommendation:** These risks can be mitigated through the development of a detailed enabling works strategy following guidance and protocol specified within the Control of Asbestos Regulations (2012) and industry best practice as detailed in CIRIA733 (*Asbestos in Soil and Made Ground: A guide to understanding risk*). Asbestos soils should be placed in line with the mitigation conceptual site model provided in Figure 5.	Low

CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	**MIGRATION PATHWAYS**	**RECEPTORS**				
Localised Spillages, HGV Parking. VOCs, hydrocarbons, volatile PAHs (naphthalene)	Inhalation of vapours. **PL4** Migration through permeable strata and preferential pathways.	Human Health – end users	Likely	High	Soil analysis has confirmed the presence of short chain volatile TPHs (C12-C16) in two locations (WS109 and WS118) in the soils. Testing of the asphalt hardstand has identified naphthalene above human health criteria. **Recommendation:** During a process of cut/fill enabling works, a hotspot removal should be undertaken where these soils are chemically validated to assess chemical suitability for retention on site in an area of no future sensitivity. There is potential for on-site treatment of these soils under a suitable treatment permit, this would allow for a more sustainable cost-effective approach when compared to removal of soils to landfill. The suitability of treatment should be confirmed following further chemical validation at remediation and enabling works stage.	Very low

CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	MIGRATION PATHWAYS	RECEPTORS				
					Visual and olfactory evidence of contamination has been identified in a number of locations, therefore a watching brief should be completed during remediation works to monitor the locations where visual or olfactory hydrocarbon impact has been identified during all phases of investigation completed to date. The asphalt should not be utilised within the development platform.	
Made Ground Sulphate from potential ash within the Made Ground.	Sulphate attack on concrete. **PL6**	Building concrete	Low likelihood	Low	Due to the presence of Made Ground on the Site, the potential for sulphate in ash deposits is high which will impact the proposed building concrete. Recommendation: Classification will be DS-1, AC-1s. Construction works to be completed with appropriate PPE and welfare facilities.	Very low

CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	**MIGRATION PATHWAYS**	**RECEPTORS**				
Made Ground Organic contaminants such as hydrocarbons, solvents	Ingestion of tainted water supply. **PL7**	Human Health – End Users Water pipeline	Likely	High	Contamination identified above PE values at pipeline depth across the west of the site (0.75–1.35 m). **Recommendation:** Barrier pipe is likely to be required following a pipeline risk assessment.	Very low
Made Ground Phytotoxic contaminants	Direct contact (plant uptake). **PL8**	Flora	Likely	Medium	Site wide inorganic and organic contamination has been identified, which is likely to be taken up by flora in soft landscaping/gardens. **Recommendation:** Cover systems to provide a suitable growing medium are likely to be required as part of any future development.	Very low

CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	MIGRATION PATHWAYS	RECEPTORS				
CONTROLLED WATERS						
Made Ground, Historic Brickworks, Lorry park, Infilled Features, Current Commercial Land Use	Leaching of contaminants from Made Ground through infiltration and percolation of rainwater. **PL5**	Controlled waters, underlying Principal Bedrock aquifer	Low likelihood	Low	Heavy metal and PAHs have been identified within the perched groundwater across the site. Site is underlain by >3m (more generally >10m) of low permeability clay that will offer protection to underlying aquifers. Given the lack of active groundwater abstraction recorded within 500m of the site, low permeability of the overlying drift limiting vertical migration and low solubilities and concentrations of heavy metals recorded, there is considered to be no unacceptable risk to controlled waters.	Low
		Infrastructure and services	Low likelihood	Low	The development of the proposed road (hardstanding and	Very low

CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	**MIGRATION PATHWAYS**	**RECEPTORS**				
					drainage) will reduce the leachate produced.	
Groundwater : Made Ground, Historic Brickworks, Lorry park, Infilled Features, Current Commercial Land Use	Contact with contaminated groundwater. **PL2**	Human Health – site personnel	Likely	Low	Groundwater is known to be below construction level, as such, it is not expected to rise above ground level or the final level of the road. However, areas of perched groundwater are likely to be encountered during enabling works. Recommendation: Construction works to be completed with appropriate PPE and welfare facilities.	Low
	Contaminants leached from the Made Ground and from off-site sources may be mobilised to greater distances through advective flow. **PL5**	Human Health – end users	Unlikely	Low	Impacted groundwater is unlikely to migrate laterally or vertically through impermeable strata. Site works will not exacerbate this. Groundwater will need to be considered for surrounding developments.	Very low

CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	**MIGRATION PATHWAYS**	**RECEPTORS**				
GROUND GAS						
Made Ground, Deep Coal Workings Ground gases (methane and carbon dioxide arising from Made Ground)	Inhalation of ground gas. **PL4** Accumulation of ground gas in confined spaces (asphyxiation or explosion)	Human Health – site personnel	Low likelihood	Low	Limited pathways for ground gases to migrate given the underlying impermeable strata. As such, unlikely to enter proposed buildings across majority of the site. Potential for organic soils in west associated with infilled water features is a source of ground gas. **Recommendation:** A period of ground gas monitoring will be required to determine the gas regime for the site. Previous monitoring suggests CS1, this reduces the risk level, however, will need confirmation. An allowance for precautionary CS2 measures should be made pending completion of the gas monitoring program.	Very low
		Human Health – end users	Low likelihood	Medium		Very low
		Infrastructure and services	Low likelihood	Low		Very low

CONTAMINANT RISK			LIKELIHOOD	SEVERITY	MITIGATION DISCUSSION	RESIDUAL RISK
SOURCES	**MIGRATION PATHWAYS**	**RECEPTORS**				
Radon	Inhalation of ground gas and accumulation in confined spaces (carcinogenic). **PL4**	Human Health – site personnel	Unlikely	Low	Radon mapping has identified the site is within an area not at risk from radon. Basic Radon mitigation measures are not required.	Very low
		Human Health – end users	Unlikely	Low		Very low

Main Exposure Pathways:
PL1 = soil ingestion, PL2 = dermal contact and ingestion, PL3 = dust inhalation; PL4 = vapour/gas inhalation; PL5 = vertical / lateral migration; PL6 = corrosion of concrete; PL7=tainting of water supply; PL8 = uptake by plants.

LEVEL OF RISK	
Very Low	
Low	
Low/Moderate	
Moderate	
Moderate/High	
High	

5. MINING ASSESSMENT

Based on the preliminary coal mine risk assessment detailed in the Phase 1 Desk study, an intrusive coal mining assessment is required to determine the potential risk of shallow coal workings, with the details provided in the following section.

5.1. SCOPE OF INTRUSIVE GROUND INVESTIGATION

In due consideration of the potential presence of a sub crop of the Doctor Seam within the north western site boundary and an area of "coal claim" in the west, a series of rotary boreholes have been advanced in accordance with Coal Authority Permission ref: 18954 dated 31st October 2019 and Coal Authority Permission ref: 27844 dated 22nd January 2024 to assess the potential presence of shallow workings within this seam and the potential for ground instability to induce a future subsidence event within the proposed development.

5.1.1. SUMMARY OF GROUND INVESTIGATION WORKS

Rotary Boreholes to Investigate Workings in Coal

Ten rotary boreholes (eight in 2019 and two supplementary boreholes in 2024) have been advanced at the locations detailed within the E3P exploratory borehole location plan at positions to interject the potential coal seams and assess the potential for any workings.

Table 22 Rotary Boreholes

ROTARY BOREHOLE	DEPTH TO ROCKHEAD (m bgl)	DEPTH TO COAL (m bgl)	SEAM THICKNESS (m)	EVIDENCE OF MINING ACTIVITY	REMARKS
RB101	14.00	-	-	-	-
RB102	13.00	12.70	0.30	-	Doctor Seam - Intact
RB103	10.00	-	-	-	-
RB104	9.00	-	-	-	-
RB105	10.50	-	-	-	-
RB106	11.70	-	-	-	-
RB107	12.10	-	-	-	-
RB108	8.90	-	-	-	-
RB201	16.60	-	-	-	-
RB202	17.20	-	-	-	-

There was evidence to suggest that some seams were being locally displaced by possible fault sub-inclusions of rock which may result in some seams being incorrectly named. For the purposes of this assessment, the names of the coal seams are inferred as best as possible for the purposes of assessing the risk from mine workings – the names of the seams are not critical.

5.2. SUMMARY OF COAL MINING ISSUES

E3P has reviewed section 5 of the Phase 1 Desk Study (E3P report ref: 17-246-r1, March 2024), BGS geological mapping and CA information, in addition to completing ten 40 m rotary boreholes to investigate shallow mine workings. A summary of the findings follows.

- The intrusive ground investigations comprising ten, deep, rotary boreholes only identified one location where coal was found to be intact at a thickness of 0.30m, which suggest this was not worked.
- There was no other evidence of coal or historic mine workings to the base of the other boreholes.
- No areas of potential shallow mine workings have been identified in the conjectured seam outcrop underlying the north western sector of the site or within the coal claim area. Investigation did not identify any potential historical shallow workings.

Given the above there is not deemed to be an unacceptable risk from historic coal mining on site.

6. GEOTECHNICAL ASSESSMENT

6.1. SOIL CONSISTENCY

Undrained shear strength values were measured using both field hand shear vane tests and laboratory undrained triaxial tests. Results of the tests are presented in Table 23 and Table 24, respectively, which indicate the clay soils to vary between stiff and very stiff. Strength test data is generally consistent with the field descriptions of the aforementioned soils.

Table 23 Summary of Hand Shear Vane Tests

LOCATION	DEPTH	SHEAR STRENGTH (KPA)	CALCULATED ALLOWABLE BEARING CAPACITY (KN/M^2)
TP102	1.00	134	314.90
TP102	1.50	164	385.40
TP103	1.00	47	110.45
TP103	1.50	64	150.40
TP105	0.80	53	124.55
TP105	1.50	133	312.55
TP106	0.80	92	216.20
TP106	1.50	159	373.65
TP107	1.00	96	225.60
TP107	1.50	165	387.75
TP109	0.50	141	331.35
TP109	1.00	177	415.95
TP110	1.00	135	317.25
TP110	1.50	160	376.00
TP111	0.50	87	204.45
TP201	0.70	114	267.90
TP201	1.50	156	366.60
TP202	1.00	127	298.45
TP202	1.40	188	441.80
TP202	1.80	179	420.65
TP205	1.00	127	298.45
TP205	1.30	151	354.85
TP208	1.00	115	270.25
TP208	1.50	142	333.70
TP210	1.00	137	321.95
TP210	1.50	152	357.20
TP211	1.00	128	300.80
TP211	1.40	155	364.25
TP211	1.80	188	441.80
TP212	0.70	121	284.35
TP212	1.20	133	312.55
TP212	1.60	179	420.65
TP212	2.00	179	420.65
TP213	0.80	152	357.20
TP213	1.00	188	441.80
TP215	2.10	81	190.35
TP215	2.50	98	230.30
TP216	0.80	97	227.95
TP216	1.20	88	206.80
TP216	1.80	65	152.75

TP216	2.40	104	244.40
TP216	3.00	110	258.5
TP217	1.00	110	258.50
TP218	0.90	121	284.35
TP218	1.30	146	343.10
TP218	1.80	169	397.15
TP218	2.00	164	385.40

Notes: ABC Calculated using Stroud and Butler et al 1974.
** granular content within soil tests may underestimate true shear strength.*

Table 24 Summary of Undrained Shear Strength in Triaxial Compression – Laboratory Test

LOCATION	SAMPLE DEPTH (m)	LAB DESCRIPTION	UNDRAINED SHEAR STRENGTH (kN/m^2)	CONSISTENCY
WS103	1.50-2.00	Very stiff reddish brown slightly gravelly very sandy CLAY	222	Very Stiff
WS112	1.00-1.60	Stiff brown slightly gravelly very sandy CLAY	79	Stiff
WS117	2.50-3.00	Stiff brown slightly gravelly very sandy CLAY	96	Stiff
WS202	1.50–2.00	Brown silty CLAY	268	Very Stiff
WS205	3.50–4.00	Brown silty CLAY	170	Very Stiff

Results of the standard penetration tests, including undrained shear strengths derived from SPTs from the 2019 and 2024 investigation are included in Table 25 and Table 26 respectively.

Table 25 Standard/Cone Penetration Test Results 2019

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m²)
WS101	1.00	Sandy CLAY	27	27.22	N/A	High strength	Very Stiff	136.10
WS101	2.00	Sandy CLAY	14	12.79	N/A	Medium strength	Stiff	63.95
WS101	3.00	Sandy CLAY	29	25.22	N/A	High strength	Very Stiff	126.10
WS101	4.00	Sandy CLAY	39	32.95	N/A	Very high strength	Very Stiff	164.75
WS101	5.00	Sandy CLAY	50	41.48	N/A	Very high strength	Very Stiff	207.41
WS102	1.00	Sandy CLAY	13	13.11	N/A	Medium strength	Stiff	65.53
WS102	2.00	Sandy CLAY	27	24.67	N/A	High strength	Very Stiff	123.33
WS102	3.00	Sandy CLAY	33	28.70	N/A	High strength	Very Stiff	143.49
WS102	4.00	Sandy CLAY	30	25.35	N/A	High strength	Very Stiff	126.73
WS102	5.00	Sandy CLAY	42	34.84	N/A	Very high strength	Very Stiff	174.22
WS103	1.00	Sandy CLAY	24	24.20	N/A	High strength	Very Stiff	120.98
WS103	2.00	Sandy CLAY	22	20.10	N/A	High strength	Very Stiff	100.49
WS103	3.00	Sandy CLAY	44	38.26	N/A	Very high strength	Very Stiff	191.32

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m^2)
WS103	4.00	Sandy CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21
WS105	1.00	MADE GROUND: Gravelly clay	18	18.15	N/A	High strength	Very Stiff	90.73
WS106	1.00	Sandy CLAY	17	17.14	N/A	High strength	Very Stiff	85.69
WS106	2.00	Sandy CLAY	28	25.58	N/A	High strength	Very Stiff	127.90
WS106	3.00	Sandy CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41
WS107	1.00	MADE GROUND: Sandy gravel	4	4.03	Loose	N/A	N/A	N/A
WS107	2.00	MADE GROUND: Sandy gravel	25	22.84	Medium Dense	N/A	N/A	N/A
WS108	1.00	Sandy CLAY	18	18.15	N/A	High strength	Very Stiff	90.73
WS108	2.00	Sandy CLAY	22	20.10	N/A	High strength	Very Stiff	100.49
WS108	3.00	Sandy CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41
WS109	1.00	MADE GROUND: Gravelly clay	4	4.03	N/A	Low strength	Firm	20.16
WS109	2.00	Gravelly CLAY	10	9.14	N/A	Medium strength	Stiff	45.68
WS109	3.00	Gravelly CLAY	26	22.61	N/A	High strength	Very Stiff	113.05

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m^2)
WS109	4.00	Gravelly CLAY	37	31.26	N/A	Very high strength	Very Stiff	156.30
WS109	5.00	Gravelly CLAY	45	37.33	N/A	Very high strength	Very Stiff	186.66
WS111	1.00	Sandy CLAY	18	18.15	N/A	High strength	Very Stiff	90.73
WS111	2.00	Sandy CLAY	21	19.18	N/A	High strength	Very Stiff	95.92
WS111	3.00	Sandy CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41
WS112	1.00	MADE GROUND: Gravelly clay	4	4.03	N/A	Low strength	Firm	20.16
WS112	2.00	MADE GROUND: Gravelly clay	2	1.83	N/A	Extremely low strength	Very Soft	9.14
WS112	3.00	MADE GROUND: Gravelly clay	2	1.74	N/A	Extremely low strength	Very Soft	8.70
WS112	4.00	MADE GROUND: Gravelly clay	4	3.38	N/A	Very low strength	Soft	16.90
WS112	5.00	MADE GROUND: Gravelly clay	1	0.83	N/A	Extremely low strength	Very Soft	4.15
WS114	1.00	Sandy CLAY	16	16.13	N/A	High strength	Very Stiff	80.65
WS114	2.00	Sandy CLAY	17	15.53	N/A	High strength	Very Stiff	77.65
WS114	3.00	Sandy CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m^2)
WS117	1.00	MADE GROUND: clayey gravel	13	13.11	Medium Dense	N/A	N/A	N/A
WS117	2.00	MADE GROUND: clayey gravel	24	21.92	Medium Dense	N/A	N/A	N/A
WS117	3.00	Gravelly CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41
WS118	1.00	Gravelly CLAY	4	4.03	N/A	Low strength	Firm	20.16
WS118	2.00	Gravelly CLAY	38	34.71	N/A	Very high strength	Very Stiff	173.57
WS118	3.00	Gravelly CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41
WS119	1.00	MADE GROUND: Gravelly clay	14	14.11	N/A	Medium strength	Stiff	70.57
WS119	2.00	Gravelly CLAY	19	17.36	N/A	High strength	Very Stiff	86.79
WS121	1.00	Gravelly CLAY	16	16.13	N/A	High strength	Very Stiff	80.65
WS121	2.00	Gravelly CLAY	29	26.49	N/A	High strength	Very Stiff	132.46
WS122	1.00	Sandy CLAY	19	19.15	N/A	High strength	Very Stiff	95.77
WS122	2.00	Sandy CLAY	38	34.71	N/A	Very high strength	Very Stiff	173.57
WS124	1.00	Sandy CLAY	50	50.41	N/A	Very high strength	Very Stiff	252.04

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m^2)
CP101	1.00	MADE GROUND: Sandy gravel	7	7.06	Loose	N/A	N/A	N/A
CP101	2.00	MADE GROUND: Sandy gravel	2	1.83	Very Loose	N/A	N/A	N/A
CP101	3.00	MADE GROUND: Sandy gravel	4	3.48	Very Loose	N/A	N/A	N/A
CP101	4.00	MADE GROUND: Sandy gravel	9	7.60	Loose	N/A	N/A	N/A
CP101	5.00	MADE GROUND: clay	9	7.47	N/A	Low strength	Firm	37.33
CP101	6.00	CLAY	24	19.68	N/A	High strength	Very Stiff	98.39
CP101	9.00	CLAY	27	21.78	N/A	High strength	Very Stiff	108.92
CP101	10.50	Silty CLAY	38	29.98	N/A	High strength	Very Stiff	149.89
CP101	12.00	Silty CLAY	36	26.79	N/A	High strength	Very Stiff	133.97
CP101	13.50	Silty CLAY	36	25.38	N/A	High strength	Very Stiff	126.88
CP102	1.00	Sandy CLAY	45	45.37	N/A	Very high strength	Very Stiff	226.83
CP102	2.00	Sandy CLAY	16	14.62	N/A	Medium strength	Stiff	73.08
CP102	3.00	Sandy CLAY	21	18.26	N/A	High strength	Very Stiff	91.31
CP102	4.00	Sandy CLAY	24	20.28	N/A	High strength	Very Stiff	101.38

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m^2)
CP102	5.00	Sandy CLAY	25	20.74	N/A	High strength	Very Stiff	103.70
CP102	6.00	Sandy CLAY	27	22.14	N/A	High strength	Very Stiff	110.68
CP102	7.50	Sandy CLAY	33	26.77	N/A	High strength	Very Stiff	133.86
CP103	1.00	Sandy CLAY	14	14.11	N/A	Medium strength	Stiff	70.57
CP103	2.00	Sandy CLAY	17	15.53	N/A	High strength	Very Stiff	77.65
CP103	3.00	Sandy CLAY	27	23.48	N/A	High strength	Very Stiff	117.40
CP103	4.00	Sandy CLAY	41	34.64	N/A	Very high strength	Very Stiff	173.19
CP103	5.00	Silty CLAY	23	19.08	N/A	High strength	Very Stiff	95.41
CP103	6.00	Silty CLAY	34	27.88	N/A	High strength	Very Stiff	139.38
CP103	7.50	SAND	50	40.56	Dense	N/A	N/A	N/A
CP105	1.00	Sandy CLAY	12	12.10	N/A	Medium strength	Stiff	60.49
CP105	2.00	Sandy CLAY	21	19.18	N/A	High strength	Very Stiff	95.92
CP105	3.00	Sandy CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41
CP105	4.00	SAND	38	32.10	Dense	N/A	N/A	N/A
CP105	5.00	SAND	39	32.36	Dense	N/A	N/A	N/A

Table 26 Standard/Cone Penetration Test Results 2024

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m²)	ALLOWABLE BEARING CAPACITY (kN/m²)*
CP/RB201	1	Brown slightly gravelly slightly sandy CLAY.	20	20.16	N/A	High strength	Very Stiff	100.81	207.28
CP/RB201	2	Brown slightly gravelly slightly sandy CLAY.	27	24.67	N/A	High strength	Very Stiff	123.33	253.56
CP/RB201	3	Brown slightly gravelly slightly sandy CLAY.	31	26.96	N/A	High strength	Very Stiff	134.80	277.14
CP/RB201	4	Brown slightly gravelly slightly sandy CLAY.	40	33.79	N/A	Very high strength	Very Stiff	168.97	347.40
CP/RB201	5	Brown slightly gravelly slightly sandy CLAY.	50	41.48	N/A	Very high strength	Very Stiff	207.41	426.43
CP/RB201	6.5	Brown slightly gravelly slightly sandy CLAY.	50	40.82	N/A	Very high strength	Very Stiff	204.10	419.62
CP/RB201	8	Brown slightly gravelly slightly sandy CLAY.	50	40.47	N/A	Very high strength	Very Stiff	202.37	416.07
CP/RB201	9.5	Brown slightly gravelly slightly sandy CLAY.	50	40.30	N/A	Very high strength	Very Stiff	201.48	414.25
CP202	1	MADE GROUND: Light grey sandy gravel.	5	5.04	Loose	N/A	N/A	N/A	50.41

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m²)	ALLOWABLE BEARING CAPACITY (kN/m²)*
CP202	2	MADE GROUND: Soft low strength brown sandy clay. (Reworked)	4	3.65	N/A	Very low strength	Soft	18.27	37.56
CP202	3	MADE GROUND: Soft low strength brown sandy clay. (Reworked)	4	3.48	N/A	Very low strength	Soft	17.39	35.76
CP202	4	Brown slightly gravelly sandy CLAY.	17	14.36	N/A	Medium strength	Stiff	71.81	147.65
CP202	5	Brown slightly gravelly sandy CLAY..	20	16.59	N/A	High strength	Very Stiff	82.96	170.57
CP202	6.5	Brown slightly gravelly sandy CLAY.	28	22.86	N/A	High strength	Very Stiff	114.29	234.99
CP202	8	Brown slightly gravelly sandy CLAY.	38	30.76	N/A	Very high strength	Very Stiff	153.80	316.21
CP202	9.5	Brown slightly gravelly sandy CLAY.	50	40.30	N/A	Very high strength	Very Stiff	201.48	414.25
CP202	11	Brown slightly gravelly sandy CLAY.	50	38.67	N/A	Very high strength	Very Stiff	193.34	397.51

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m²)	ALLOWABLE BEARING CAPACITY (kN/m²)*
CP202	1	Brown slightly gravelly sandy CLAY.	14	14.11	N/A	Medium strength	Stiff	70.57	145.09
CP203	2	Brown slightly gravelly sandy CLAY.	19	17.36	N/A	High strength	Very Stiff	86.79	178.43
CP203	3	Brown slightly gravelly sandy CLAY.	21	18.26	N/A	High strength	Very Stiff	91.31	187.74
CP203	4	Brown slightly gravelly sandy CLAY.	24	20.28	N/A	High strength	Very Stiff	101.38	208.44
CP203	5	Brown slightly gravelly sandy CLAY.	31	25.72	N/A	High strength	Very Stiff	128.59	264.38
CP203	6.5	Brown slightly gravelly sandy CLAY.	33	26.94	N/A	High strength	Very Stiff	134.70	276.95
CP203	8	Brown slightly gravelly sandy CLAY.	40	32.38	N/A	Very high strength	Very Stiff	161.89	332.85
CP203	9.5	Brown slightly gravelly sandy CLAY.	50	40.30	N/A	Very high strength	Very Stiff	201.48	414.25
CP203	11	Brown slightly gravelly sandy CLAY.	50	38.67	N/A	Very high strength	Very Stiff	193.34	397.51

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m^2)	ALLOWABLE BEARING CAPACITY (kN/m^2)*
CP203	1	MADE GROUND: Brown slightly gravelly clay. (Reworked).	9	9.07	N/A	Medium strength	Stiff	45.37	93.27
WS201	2	MADE GROUND: Brown slightly gravelly clay. (Reworked).	12	10.96	N/A	Medium strength	Stiff	54.81	112.69
WS201	3	Brown slightly gravelly CLAY.	23	20.00	N/A	High strength	Very Stiff	100.01	205.62
WS201	4	Brown slightly gravelly CLAY.	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25
WS201	1	Brown slightly gravelly CLAY.	19	19.15	N/A	High strength	Very Stiff	95.77	196.91
WS202	2	Brown slightly gravelly CLAY.	47	42.94	N/A	Very high strength	Very Stiff	214.68	441.39
WS202	2	Brown slightly gravelly CLAY.	47	42.94	N/A	Very high strength	Very Stiff	214.68	441.39
WS202	3	Brown slightly gravelly CLAY.	50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS202	1	MADE GROUND: Reddish brown slightly clayey slightly gravelly fine to medium sand.	6	6.05	Loose	N/A	N/A	N/A	60.49

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m²)	ALLOWABLE BEARING CAPACITY (kN/m²)*
WS203	2	Brown slightly gravelly CLAY.	15	13.70	N/A	Medium strength	Stiff	68.52	140.87
WS203	3	Brown slightly gravelly CLAY.	50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS203	1	MADE GROUND: Brown slightly gravelly clay.	5	5.04	N/A	Low strength	Firm	25.20	51.82
WS204	2	Brown slightly gravelly CLAY.	17	15.53	N/A	High strength	Very Stiff	77.65	159.65
WS204	3	Brown slightly gravelly CLAY.	31	26.96	N/A	High strength	Very Stiff	134.80	277.14
WS204	3.8	Brown slightly gravelly CLAY.	50	42.44	N/A	Very high strength	Very Stiff	212.21	436.31
WS204	1	MADE GROUND: Brown slightly gravelly clay. (Reworked).	8	8.07	N/A	Medium strength	Stiff	40.33	82.91
WS205	2	MADE GROUND: Brown slightly gravelly clay. (Reworked).	15	13.70	N/A	Medium strength	Stiff	68.52	140.87
WS205	3	Brown slightly gravelly CLAY.	28	24.35	N/A	High strength	Very Stiff	121.75	250.32
WS205	4	Brown slightly gravelly CLAY.	46	38.86	N/A	Very high strength	Very Stiff	194.32	399.51
WS205	5	Brown slightly gravelly CLAY.	50	41.48	N/A	Very high strength	Very Stiff	207.41	426.43

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m²)	ALLOWABLE BEARING CAPACITY (kN/m²)*
WS205	1	No Recovery. Assumed MADE GROUND: Gravelly fine to medium sand.	27	27.22	Medium Dense	N/A	N/A	N/A	272.20
WS206	1.8	No Recovery. Assumed MADE GROUND: Gravelly fine to medium sand.	50	46.32	Dense	N/A	N/A	N/A	463.23
WS206	1	Brown slightly gravelly CLAY.	26	26.21	N/A	High strength	Very Stiff	131.06	269.46
WS207	2	Brown slightly gravelly CLAY.	31	28.32	N/A	High strength	Very Stiff	141.60	291.13
WS207	3	Brown slightly gravelly CLAY.	44	38.26	N/A	Very high strength	Very Stiff	191.32	393.36
WS207	3.5	Brown slightly gravelly CLAY.	50	42.78	N/A	Very high strength	Very Stiff	213.92	439.81
WS207	1	Brown slightly gravelly CLAY.	16	16.13	N/A	High strength	Very Stiff	80.65	165.82
WS208	2	Brown slightly gravelly CLAY.	20	18.27	N/A	High strength	Very Stiff	91.35	187.82
WS208	3	Brown slightly gravelly CLAY.	32	27.83	N/A	High strength	Very Stiff	139.14	286.08
WS208	4	Brown slightly gravelly CLAY.	30	25.35	N/A	High strength	Very Stiff	126.73	260.55
WS208	5	Brown slightly gravelly CLAY.	36	29.87	N/A	High strength	Very Stiff	149.33	307.03

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m^2)	ALLOWABLE BEARING CAPACITY (kN/m^2)*
WS208	1	Brown slightly gravelly CLAY.	14	14.11	N/A	Medium strength	Stiff	70.57	145.09
WS209	2	Brown slightly gravelly CLAY.	21	19.18	N/A	High strength	Very Stiff	95.92	197.21
WS209	3	Brown slightly gravelly CLAY.	22	19.13	N/A	High strength	Very Stiff	95.66	196.68
WS209	4	Brown slightly gravelly CLAY.	26	21.97	N/A	High strength	Very Stiff	109.83	225.81
WS209	5	Brown slightly gravelly CLAY.	31	25.72	N/A	High strength	Very Stiff	128.59	264.38
WS209	1	Brown slightly gravelly CLAY.	13	13.11	N/A	Medium strength	Stiff	65.53	134.73
WS210	2	Brown slightly gravelly CLAY.	26	23.75	N/A	High strength	Very Stiff	118.76	244.17
WS210	3	Brown slightly gravelly CLAY.	29	25.22	N/A	High strength	Very Stiff	126.10	259.26
WS210	4	Brown slightly gravelly CLAY.	33	27.88	N/A	High strength	Very Stiff	139.40	286.61
WS210	5	Brown slightly gravelly CLAY.	37	30.70	N/A	Very high strength	Very Stiff	153.48	315.55
WS210	1	Brown slightly gravelly CLAY.	20	20.16	N/A	High strength	Very Stiff	100.81	207.28
WS211	2	Brown slightly gravelly CLAY.	26	23.75	N/A	High strength	Very Stiff	118.76	244.17
WS211	3	Brown slightly gravelly CLAY.	30	26.09	N/A	High strength	Very Stiff	130.45	268.20
WS211	4	Brown slightly gravelly CLAY.	35	29.57	N/A	High strength	Very Stiff	147.85	303.98
WS211	4.7	Brown slightly gravelly CLAY.	50	41.67	N/A	Very high strength	Very Stiff	208.37	428.41

NOTES
* The Allowable Bearing Capacity (ABC) should be considered indicative.
The interpretation of in situ mass undrained shear strength (cu) data from SPT Blow Count (N) results and the influence of the Plasticity Index (PI) was reported in Standard Penetration Test in Insensitive Clays and Soft Rocks. Stroud (1974). The standard penetration test and the engineering properties of glacial materials subsequently. Stroud and Butler (1975) and (1989).
Allowable bearing capacity on sands. Soil Mechanics in Engineering Practice Terzaghi, K. & Peck, R.B. 1996.

6.2. SIDE STABILITY AND EASE OF EXCAVATION

The sides of the exploratory trial pit excavations appeared to be generally stable during short-term excavation. However, during the window sample drilling in 2019 a number of boreholes were terminated due to Made Ground collapsing into the boreholes.

The presence of brick and concrete and the compacted nature of the Made Ground deposits meant that in certain places, excavation was slow through in some places. The natural strata were also excavated with some difficulty due to the very stiff, high strength of the CLAY.

6.3. CONSOLIDATION

Four undisturbed samples of Glacial Till were submitted for oedometer analysis. The results are provided in Table 27.

Table 27 Oedometer Consolidation Results

LOCATION	DEPTH (M)	SAMPLE TYPE	MOISTURE CONTENT (%)	OEDOMETER CONSOLIDATION		
				PRESSURE RANGE (kPa)	Mv (m^2/MN)	Cv (m^2/year)
WS106	0.50-1.00	U100		0-15	Swelling	Swelling
				15-30	0.104	1.283
				30-60	0.255	0.952
				60-120	0.186	0.935
				120-15	0.140	5.013
WS114	1.50-2.00	U100		0-35	0.172	13.744
				35-70	0.212	9.464
				70-140	0.150	5.592
				140-280	0.088	3.245
				280-35	0.043	4.483
WS125	1.00-1.50	U100		0-25	Swelling	Swelling
				25-50	0.095	11.443
				50-100	0.183	9.974
				100-200	0.145	4.321
				200-25	0.071	9.683
WS207	1.50-2.00	U100	12.1	0–35	0.87	32.72
				35–70	0.45	28.88
				70–140	0.28	7.93
				140–280	0.14	3.28
				280–35	0.06	-

The results have determined that the clay soil is of moderate compressibility under a loading of up to 280 kN/m^2.

Engineering of this type of material will need to be completed during favourable climatic conditions.

The coefficient of volume compressibility (Mv) from the 2019 investigation ranged from 0.043 m^2 /MN up to 0.25 m^2 /MN. When considered at over-burden pressure with an additional load of 120 kPA up to 280 kPa the coefficient of volume compressibility (Mv) ranged from 0.088 m^2 /MN to 0.186 m^2 /MN. The material is therefore considered to be low compressibility.

The coefficient of volume compressibility (Mv) from the 2024 investigation ranged from 0.06 m^2 /MN up to 0.87 m^2 /MN. When considered at over-burden pressure with an additional load of 110 kPa the coefficient of volume compressibility (Mv) is 0.14 m^2 /MN. The material is therefore considered to be low compressibility.

The rate at which settlement is likely to occur is determined by the coefficient of consolidation (Cv). As shown in Table 25, the coefficient ranges from 0.935 m^2/yr to 32.72 m^2/yr. The rate at which settlement will occur within the Glacial Till and it is likely that settlement will occur over a period of months to years.

6.4. PARTICLE SIZE DISTRIBUTION

Particle Size Distribution Tests have been undertaken on selected samples via wet sieve to obtain information on the soil fractions. The results are included in Table 28. The full results can be found in APPENDIX IX.

Table 28 Summary of Particle Size Distribution Test Results

LOCATION	DEPTH (M)	SOIL FRACTION (%)			
		COBBLES	GRAVEL	SAND	SILT/CLAY
CP202	1.50 (Made Ground)	0	64	15	21
TP203	0.40 (Made Ground)	36	61	2	1
TP207	1.30 (Natural)	0	3	24	73
TP211	0.30 (Made Ground)	14	73	9	5
TP216	1.00 (Made Ground)	0	11	20	69

6.5. SOIL DENSITY/MOISTURE CONTENT RELATIONSHIP

Dry density / moisture content relationship analysis has been conducted on soils using compaction tests utilising a 4.5kg rammer. The results of the tests have been summarised in Table 29. The full test results can be found in APPENDIX IX.

Table 29 Summary of Dry Density and Moisture Content

LOCATION	LABORATORY DESCRIPTION	TOP DEPTH (M)	METHOD OF COMPACTION	INITIAL MOISTURE CONTENT (%)	OPTIMUM MOISTURE CONTENT (%)	MATERIAL RETAINED ON 37.5 MM SIEVE (%)	MAX DRY DENSITY (MG/M³)	MATERIAL RETAINED ON 20.0 MM TEST SIEVE (%)
TP207	Brown silty slightly sandy slightly gravelly CLAY	1.30	4.5kg	6.4	10	0	2.03	0
TP216	Made Ground clay	1.00	4.5kg	11.4	15	0	1.80	3

The proctor compaction tests have indicated that the materials on site are dry of the optimum.

6.6. SOIL INFILTRATION

In-situ BRE 365 Soakaway tests were undertaken over a 48 hour period within trial pits completed as SA101-SA103.

The results are presented in Table 30 and the test certificates are included within APPENDIX IX.

Table 30 Soil Infiltration Results

LOCATION	DEPTH (M)	MATERIAL	TEST NO.	SOIL INFILTRATION RATE (M/S)
SA201/ TP208	0.70–1.80	Very stiff CLAY	1	N/A
SA202/ TP210	0.70–1.70	Very stiff CLAY	1	N/A
SA203/ TP201	0.40–1.50	Very stiff CLAY	1	N/A

The water level did not fall below the 75% or 25% effective storage depth over a period of 48 hours, as such the test was deemed to have failed.

The site is underlain by stiff CLAY to a depth of 15.00 m bgl. Due to the presence of underlying cohesive soils and given that the water level did not drop to the required effective depths during BRE permeability testing (indicating poor drainage conditions), it is considered that soakaway drainage will not be feasible at the subject site.

6.7. SOIL PLASTICITY

The liquid and plastic limits of samples of natural in-situ clay are determined using the cone penetrometer method and the rolling thread test. These tests enable determination of an average plasticity index (PI) for each “type” of clay, although judgement is applied where variable results are reported.

PI can be related to shrinkability (low, medium or high) and then to minimum founding depth.

E3P typically only consider a soil to be shrinkable if the proportion finer than 63 µm is > 35%.

PI results are compared against guidance given in the NHBC standards, Chapter 4.2 (revised January 2014), which advocates the use of modified plasticity index (I'p), defined as:

$$I'p = Ip \times (\% < 425\ \mu m/100)$$

In other words, if PI is 30%, but the soil contains 80% < 425 µm, then I'p = 30 × 80/100 = 24%.

It should be noted that in accordance with the requirements of BS 1377, the % passing the 425 µm sieve is routinely reported by testing labs.

E3P apply engineering judgement where PI results are spread over a range of classifications. Consideration is given to the average values for each particular soil type (differentiate between residual soil and alluvium), the number of results in each class and the actual values.

The Atterberg limits determinations, summarised in
Table 31, show the clay to be of low to moderate plasticity.

Table 31 Summary of Plasticity Index Test results

LOCATION	DEPTH (M)	NATURAL MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING 425 MM SIEVE (%)	MODIFIED PLASTICITY INDEX	NHBC VOLUME CHANGE POTENTIAL
WS102	1.00	17	18	38	20	89	17.80	Low
WS107	1.00	17	17	35	18	91	16.38	Low
WS109	2.00	19	19	40	21	94	19.74	Low
WS114	1.00	21	18	36	18	95	17.10	Low
WS117	2.00	17	18	37	19	92	17.48	Low
WS118	2.00	17	19	39	20	90	18.00	Low
WS201	1.00-1.45	18.1	14	43	29	100	29	Medium
WS211	2.00-2.45	14	12	38	26	91	23.66	Medium
CP201	1.00-1.45	15.4	13	40	27	100	27	Medium

The results of the Atterberg limits testing confirmed that the soils would be deemed to be "Medium Volume Change Potential" in accordance with the classification system utilised by the LABC/NHBC industry guidance.

Results from the 2019 investigation found the natural deposits on site to be of Low Volume Change Potential with the modified plasticity index ranging between 16.38 and 19.74 at depths between 1 and 2m bgl.

6.8. PH AND SULPHATE

Chemical analyses for pH and soluble sulphate content contained in APPENDIX VIII (summarised in Table 32), shows that the soils at the site generally meet Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with BRE *Special Digest 1* (2005).

Elevated sulphate concentrations meeting Class DS-2, AC-1s were noted within the Made Ground deposits in WS208 at 0.80 m bgl. Additionally, elevated sulphate concentrations meeting Class DS-3 and AC-2s were noted within natural deposits of WS202 located within the warehouse to the east of the site.

Table 32 Summary of pH and Sulphate Data

LOCATION	DEPTH (M)	SO_4 IN 2:1 WATER/SOIL (G/L)	PH VALUE	CLASSIFICATION
TP102	0.50	0.066	8.7	DS-1, AC-1s
TP103	0.90	0.021	7.4	DS-1, AC-1s
TP106	1.00	0.070	8.3	DS-1, AC-1s
WS101	0.20	0.055	8.7	DS-1, AC-1s
WS102	0.90	0.040	8.0	DS-1, AC-1s
WS107	0.70	0.11	8.5	DS-1, AC-1s
WS109	0.50	0.067	7.6	DS-1, AC-1s
WS111	0.90	0.14	8.3	DS-1, AC-1s
WS112	2.10	0.041	8.0	DS-1, AC-1s
WS114	0.50	0.066	9.1	DS-1, AC-1s

LOCATION	DEPTH (M)	SO_4 IN 2:1 WATER/SOIL (G/L)	PH VALUE	CLASSIFICATION
WS117	0.80	0.050	8.0	DS-1, AC-1s
WS118	0.90	0.10	8.5	DS-1, AC-1s
WS119	0.20	0.020	8.2	DS-1, AC-1s
WS122	0.70	0.13	8.1	DS-1, AC-1s
WS122	1.20	0.070	8.6	DS-1, AC-1s
TP201	0.30	0.015	11.9	DS-1, AC-1s
TP201	0.60	0.065	8.5	DS-1, AC-1s
TP203	0.50	0.084	8.9	DS-1, AC-1s
TP204	1.30	0.098	8.6	DS-1, AC-1s
TP205	0.50	0.13	9.5	DS-1, AC-1s
TP207	0.90	0.075	8.6	DS-1, AC-1s
TP208	1.50	0.23	8.5	DS-1, AC-1s
TP209	0.20	0.014	8.8	DS-1, AC-1s
TP209	1.30	0.08	8.1	DS-1, AC-1s
TP211	0.20	0.04	8.7	DS-1, AC-1s
TP212	1.50	0.043	8.6	DS-1, AC-1s
TP214	1.10	0.063	8.6	DS-1, AC-1s
TP215	0.80	0.037	8.1	DS-1, AC-1s
TP216	2.00	0.09	8.4	DS-1, AC-1s
TP217	0.30	0.048	8.8	DS-1, AC-1s
TP218	1.40	0.029	8.7	DS-1, AC-1s
WS202	1.30	1.8	8.6	DS-3, AC-2s
WS204	1.80	0.079	8.5	DS-1, AC-1s
WS208	0.80	1.4	7.8	DS-2, AC-1s
WS208	2.30	0.21	8.6	DS-1, AC-1s
WS211	0.50	0.045	8.7	DS-1, AC-1s

6.8.1. HIGHWAYS AND CONCRETE

MCHW Series 600 provides a criterion of 1500mg/l for water-soluble sulphate within 500mm of any concrete structure.

A second criteria of 300 mg/l is given with respect to soils within 500mm of steel structures.

As per Table 32 isolated areas of Made Ground exceed both these thresholds (WS202 and WS208), indicating isolated areas of aggressive sulphates within the Made Ground.

6.9. GROUNDWATER

Table 33 Summary of Groundwater Strikes

LOCATION	DEPTH (M BGL)	DESCRIPTION OF STRIKE	STRATA	EVIDENCE OF CONTAMINATION
Site Investigation Water Strike Information				
TP101	0.70	Perched - slow ingress	Made Ground	-
TP103	0.50	Perched - slow ingress	Made Ground	-
TP104	0.40	Slow ingress	Made Ground	-
TP105	0.60	Perched - slow ingress	Made Ground	-

LOCATION	DEPTH (M BGL)	DESCRIPTION OF STRIKE	STRATA	EVIDENCE OF CONTAMINATION
TP106	0.40	Perched - slow ingress	Made Ground	-
TP107	0.70	Perched - slow ingress	Made Ground	-
WS112	2.10	Slow ingress	Made Ground	-
WS122	1.00	Perched - slow ingress	CLAY	-
WS124	0.70	Perched - slow ingress	Made Ground	-
CP/RB201	0.70	Perched	Made Ground	-
CP/RB201	4.30	Groundwater strike	CLAY	-
CP202	0.60	Perched	Made Ground	-
TP203	0.60	Fast ingress	Made Ground	-
TP204	1.30	Moderate ingress	Made Ground	-
TP205	1.40	Seepage	Made Ground	-
TP206	1.00	Perched	Made Ground	-
TP206	1.70	Fast ingress	Made Ground	-
TP215	2.00	Perched	CLAY	-
TP216	1.20	Perched	Made Ground	-
WS203	1.60	Perched	Made Ground	-
Groundwater Monitoring Summary from Installations 2019				
WS101	0.44 – 0.89	Nov 2019 - April 2020	Generally winter months (wet)	Water level generally decreasing in March 2020 (coming out of winter months)
WS106	0.43 – 1.70			
WS107	0.69 – 0.85			
WS108	0.42 – 0.56			
WS109	1.40 – 1.60			
WS111	GL – 0.59			
WS112	0.10 – 2.62			
WS114	GL – 0.31			
WS117	0.73 – 0.94			
WS118	0.48 – 0.62			
WS121	0.43 – 0.90			
WS122	0.38 – 0.56			
Groundwater Monitoring Summary from Installations 2024				
WS201	Dry	January 2024	Wet	Two visits undertaken to date
WS202	1.20 – 1.25			
WS203	1.35 – 1.41			
WS205	1.57 – 1.85			
WS209	0.80 – 1.90			
WS210	0.60			
WS211	0.45 – 1.92			
DBH205	0.50 – 0.89			
DBH207	0.90 – 1.31			
CP202	0.80 – 1.05			

Perched water strikes have been located on site during the investigation, these were typically associated with Made Ground overlying natural cohesive which created a perched waterbody. Surrounding locations did not present any plausible trend with a shallow groundwater flow.

During both phases of investigation no consistent groundwater table was encountered, however, high groundwater levels were encountered during the monitoring period, likely associated with pooling of surface water/perched groundwater within monitoring wells.

6.10. SITE PREPARATION

Our assessment has been based on the fact that the site will be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the *Manual of Contract Documents for Highway Works (MCHW).* This should include the following:

- Demolition of all existing buildings and removal of all hardstanding.
- Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.
- Buried structures and old foundations have been encountered on site. These should be excavated from below the proposed development footprint with the resulting void backfilled.
- Roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void infilled with suitable compacted engineered fill.

6.11. FOUNDATION CONDITIONS AND ASSESSMENT OF POTENTIAL BEARING CAPACITIES

In due consideration of the identified ground conditions, in-situ and laboratory geotechnical testing, E3P has undertaken an assessment of the safe allowable bearing capacity (ABC) within the underlying natural stratum to assist in the detailed design of foundations and infrastructure and determine the target founding stratum. The results of this assessment are summarised in Table 34.

Table 34 Summary of ABC

Description	Depth (range m bgl)	Undrained Shear Strength (Cu) (kN/m^2)	Allowable Bearing Capacity (kN/m^2)
Summary of 2024 Investigation Cohesive Soils ABC			
Stiff, Gravelly CLAY	1.00–4.45	65.62–71.81	134.73–147.65
Very stiff CLAY	1.00–5.00	77.65-95.92	159.65-197.21
	1.00-6.50	100.01-141.6	205.62-219.13
	3.00-8.00	147.5-194.32	303.98-399.51
	3.00-8.00	203.37-217.41	416.07-447
	9.50-11.00	193.34-201.48	397.51-414.25
Summary of 2019 Investigation Cohesive Soils ABC			
Firm to Very Stiff, Gravelly CLAY	1.00–3.45	20–217	41-447
Stiff to Very Stiff Sandy CLAY	1.00-2.45	60-252	124-518
Stiff to Very Stiff Sandy CLAY	3.00-5.45	91-217	187-447
Very Stiff Silty CLAY	3.00-10.50	95-152	196-312
Summary of 2019 Investigation Granular Soils ABC			
SAND	4.00-7.50	Dense	321-405

Based on the assessment of the relative undrained shear strength, relative in-situ densities and corresponding safe net allowable bearing pressure, the suitable target founding stratum has been identified as the underlying stiff to very stiff glacial clays and localised areas of dense sands.

6.12. FOUNDATIONS OPTIONS APPRAISAL

Prior to the detailed design of suitable foundations solutions, a programme of remediation and enabling works will be required to remove the extensive buried obstructions and cut/fill the site to provide suitable development platform levels.

Significant underground obstructions are also anticipated beneath the footprint of the commercial buildings, along with significant volumes of historical Made Ground fil material within the former clay pits. This will negate the use of shallow strip footings and mass trench fill.

Extensive relict obstructions should be anticipated beneath the former brickworks and chimney bases.

Therefore, upon completion of these remediation works it is likely that the most cost-effective option for the majority of the site would be to remediate and re-engineer the Made Ground to facilitate Ground Improvements by Vibro Stone Columns (VSC) that will ensure a uniform ABP in the order of 100kN/m^2 for the construction of a doubly reinforced strip footing at ~600mm below remediated ground level (typically 1050mm below FFL).

To determine if VSC is viable at the subject site, E3P has completed a Ground Improvement Design Risk Matrix that is summarised in Table 35.

Table 35 Ground Improvement Design Risk Matrix

RISK ITEM	COMMENT	PASS/FAIL
Soft clays with an undrained shear strength less than 30 kN/m^2	CLAY soils are generally firm to stiff with Cu > 65 kN	PASS
Ground with peat layers close to foundation level or the base of the stone column, or where intermediate layers of peat are thicker than 200 mm, either as a single layer or the sum of the thicknesses of individual layers throughout the length of the stone column	Peat has not been identified on site.	PASS
Voided filled ground, e.g. old water tanks, pottery, glass bottles, concrete rubble or brick fill of unsuitable grading	Deep Made Ground in the western sector will require removal and processing to render the site suitable for VSC. The existing buildings substructure will also require excavation and processing into a graded aggregate suitable for vibro treatment. No voids have been encountered within investigations to date.	PASS – on completion of enabling works
Loose or non-engineered fill not previously subject to rising or fluctuating water levels saturation	Loose Made Ground fills have been encountered sporadically across the site. Made Ground in the will require removal and processing to render the site suitable for VSC	PASS – on completion of enabling works
Filled ground still settling or expected to settle under its own weight or due to the effects of surcharging/upfilling where there is a high organic content or where decay is continuing	None identified.	PASS

RISK ITEM	COMMENT	PASS/FAIL
Fill, containing degradable material where organic material forms more than 15% of fill by volume	None identified.	PASS
Clays with a plasticity index greater than 40%	None identified.	PASS
Highly sensitive soils liable to collapse or remoulding	None identified.	PASS
Cohesive soils with trees in influencing distance	Plots where tree influence has been modelled and will be subject to a driven pile/engineered solution.	PASS
Overall Risk Rating and Suitability for Vibratory Ground Improvement		**PASS**

It is advisable to consult with geotechnical engineers and foundation specialists who can assess the specific ground conditions and design an appropriate Vibro Stone Column system to meet the project's requirements. They will consider factors such as soil composition, depth, and spacing of the stone columns to ensure effective ground improvement and proper load distribution for the strip foundation.

Should the levels decrease across the site, there is potential that proposed plots could be constructed using strip or trench-fill foundations bearing on the underlying stiff to very stiff high-strength natural clays.

The exception to VSC or standard foundations would be in the location of the proposed four storey apartment buildings, plots within tree influence and plots within influencing distance of retaining structures. Dependent on loadings, plots in these areas are likely to require a driven pile foundation.

Foundation depths should take account of the presence of existing and proposed trees, especially along the northern and western boundary if the site. Foundations should be deepened locally to mitigate the potential for volumetric instability attributed to fluctuations in moisture content, in accordance with the requirements of NHBC standards.

It is recommended that at working drawing stage a foundation schedule is prepared for the development, taking account of the physical change of natural clay soils and the current/proposed locations of trees.

At this time, it is not possible to accurately define the foundation types due to the absence of a detailed tree survey and final development levels/loadings; however, based on our extensive experience of similar sites, we would anticipate that the final foundation solution would be a combination of the following:

- VSC/Trench fill to support reinforced strip foundations in areas of variable ground; and,
- Where apartment buildings, tree influence or plots within influencing distance of retaining structures it may be necessary to use a driven pile foundation.

6.13. GROUND FLOOR SLABS

Current building control regulations require that where infilled ground is present to depths in excess of 600 mm, or where the substratum is variable in terms of the structure and settlement potential, or where clay soils are present within the influence of existing or proposed trees, a suspended floor slab is required.

In this instance, it is considered that for the majority of substructures, the underlying stratum would have in excess of 600 mm of infill and in areas of clay soils as such, a suspended floor slab will be required.

6.14. SETTLEMENT

The site has been appraised through desk based information and site investigation data in order to inform geotechnical risk where possible. Table 36 below has been formulated to determine if settlement risks are required to be further appraised. Where any item is determined to be appraised a settlement appraisal for the site should be prepared upon receipt of development levels and layout.

Table 36 Summary of Geotechnical Information for Settlement

RISK	COMMENT	ASSESSMENT
Site is located in an area deemed to be at Risk from Ground Dissolution from desk based information	The site is at a negligible risk area of ground dissolution based on BGS data searches.	No Further Assessment
Site is in an area where geology is reported as having a compressible risk from desk based information	No peat or alluvium have been identified on the site.	No Further Assessment
Do historical maps indicate relic excavation features such as opencast or ponds that have been infilled.	Historical maps indicated infilled ponds and clay pits on-site. Deep Made Ground has been identified in the south west of the site.	Delineation of historic ponds and removal of any pond bases. Turnover of Made Ground soils to top of natural and upfill of material to a suitable geotechnical design.
Has the site been proven to be underlain by anthropogenic materials to an unknown specification?	Yes filled ground to a maximum unproven depth of 5.45 m bgl.	Turnover of Made Ground soils to top of natural and upfill of material to a suitable geotechnical design.
Have Oedometers and/or ground conditions reported compressible stratum on site?	Oedometers have not identified highly compressible stratum on site.	No Further Assessment
Have High walls been identified on site that could result in differential settlement?	Depth of Made Ground is variable across the site. Potential high walls have been located in the south west and east of the site associated with infilling of historic features.	Turnover of Made Ground soils to top of natural and upfill of material to a suitable geotechnical design.
Has any evidence been observed on site indicating settlement (non-structural assessment)	None.	No Further Assessment
Is voided ground present beneath the site?	None.	No Further Assessment
Is the site in an area where a mobile groundwater regieme is present in influencing distance of foundations and infrastructure?	No.	No Further Assessment
Will the site be subject to changes in site levels that may induce heave or settlement?	Final levels have not yet been confirmed. Upon review of these further assessment can be undertaken. However, significant cut and fill works are not anticipated.	Further Assessment Upon Receipt of Final Levels

In-situ geotechnical sampling classified the underlying natural cohesive soils as firm to very stiff, no areas of soft clays have been identified within investigations undertaken to date. Additionally, consolidation testing has not recorded highly compressible soils. Given the above there is deemed to be a very low risk associated with settlement of the underlying natural cohesive strata.

The presence of variable historical Made Ground deposits represent a risk associated with the consolidation of materials that could induce unacceptable settlement to structures and infrastructure. Made Ground should be turned over to the top of natural and engineered in line with a suitable geotechnical design. Should ground levels change by over 2.5 m as part of the proposed development, further settlement analysis and zone load testing may be required.

6.15. HEAVE PRECAUTIONS

The site has been proven to be underlain by clay soils which are susceptible to volumetric instability due to fluctuations in moisture content, particularly within influencing distance of trees as per the NHBC/LABC conjectures zones of influence.

The clay has been determined as being of a low and medium volume change potential. Table 37 shows where heave precautions are required for a trench fill, pier and beam and pile and beam foundation types which are in the zone of influence of trees which are to remain or be removed.

Table 37 Position of Heave Precautions

SITUATION	TRENCH FILL	PIER AND BEAM	PILE AND BEAM
External trench fill and pier foundations. Unless NHBC is satisfied that the soil is not desiccated compressible material should be provided to the:	Inside faces of external wall foundations deeper than 1.5m, based on the appropriate tree height.	All faces of pier foundations deeper than 1.5m, based on the appropriate tree height.	N/A
External ground beams. Unless NHBC is satisfied that the soil is not desiccated, compressible material or void formers should be provided to the:	N/A	Inside faces	Inside faces
Internal trench fill foundations and ground beams. Compressible material required:	No	No	No
External and internal ground beams. Compressible material, void former or void should be provided to the underside of:	N/A	All	All
Heave precautions required for proposed trees where the soil is not desiccated:	No	No	No

A summary of heave precautions is presented in Table 38.

Table 38 Summary of Heave Precautions

VOLUME CHANGE POTENTIAL	VOID DIMENSION AGAINST SIDE OF FOUNDATION AND GROUND BEAM	VOID DIMENSION UNDER GROUND BEAMS, AND SUSPENDED IN-SITU CONCRETE GROUND FLOOR	VOID DIMENSION UNDER SUSPENDED PRECAST CONCRETE AND TIMBER FLOORS(1)
High	35mm	150mm	300mm
Medium	25mm	100mm	250mm
Low	0mm	50mm	200mm

In addition to the requirements of the 'Drainage' section, drainage near trees should incorporate additional provisions. Where there is a volume change potential within the ground, the provisions include:

- Increased falls to cater for any ground movement.
- Deeper and wider backfill of granular material.
- A drainage system that is capable of movement should heave and shrinkage occur.
- Drainage pipes should not be encased in concrete.
- Additional clearance is required where drains pass through the structure of a building to allow for additional movement.

6.16. HIGHWAYS CONSTRUCTION

A programme of remediation and enabling works will be required to remediate the proposed road subgrade in accordance with the requirements of the Manual of Contract Documents for Highway Works Volume 1 Specification For Highway Works (Series 600-Earthworks) for a method compaction.

Bulk earthworks to construct highways to the underside of capping. Enabling works contractor will need to do CBRs to determine the capping layer etc.

6.17. DRAINAGE

Shrinkage and heave of clay soils can affect pipelines. To protect against the effects of heave, drainage should be designed:

- To take account of potential ground movement as shown in Table 39 , including where pipes and services pass through substructure walls or foundations.
- With gradients which may need to be steeper.
- To use alternative means of catering for the movement when sufficient falls cannot be provided, for example, by deepening the excavation and laying pipework on a granular bedding of suitable thickness to reduce the extent of potential movement.

Table 39 Potential Ground Movement for Drainage

VOLUME CHANGE POTENTIAL	HIGH	MEDIUM	LOW
Potential ground movement	150mm	100mm	50mm

6.18. EXCAVATIONS

In the west trial pits were generally stable in both granular Made Ground and natural strata; as such, it is considered that near-surface excavations will be feasible. In the centre and east of the site excavations were less stable particularly in areas of obstructions and fast water ingress.

Site observations indicated that excavations should be feasible in the near surface with normal plant; however, obstructions were identified in the near surface, including potential former footings and floor slabs. It is anticipated that any obstructions will be grubbed out during the reduced-level dig for the substructure works.

Excavations through the natural strata were slow given the high strength of the soils. Excavation with normal plant is achievable, however, works are likely to progress at a slower rate with smaller machinery.

Due to the depth and variability of the Made Ground and likelihood of trench collapse, it is considered that all excavations are supported or battered back in accordance with guidance contained in CIRIA R97. If local pumping of groundwater is required during the advancement of excavations for the proposed foundations then consideration should be given to the potential for dewatering gravels in the surrounding areas that could cause structural damage to building substructures in close proximity to the site.

An underpass/cutting is present on the eastern side of the butchers building. Dependant on final development levels there is potential for a large voided area that will require upfill to a suitable geotechnical design.

Table 40 Civil Engineering Excavation Risk Matrix

RISK ITEM	PRESENT	COMMENT
Running Sands	No	No running sand has been identified.
Minor Water Ingress	Yes	Minor water ingress will require localised dewatering/sump pumping during the construction of site drainage infrastructure. Ingress of water into foundation excavation will potentially flood foundation excavations, limiting the viability of spread foundations to be constructed.
Shallow Bedrock	Yes	Shallow bedrock has not been identified across the majority of the site, however, along the eastern boundary top of bedrock was encountered at 5.50 m bgl. This should be considered during drainage and infrastructure design.

6.19. SLOPE STABILITY

A significant embankment is present at the northern boundary leading to Network Rail infrastructure (railway track) in a cutting at the upper elevation of this slope.

As and when detailed topographic information is available and in due consideration of the proposed development design, structural and infrastructure loading, a detailed slope stability model will be required. This model will seek to determine the potential for newly imposed loadings to generate a risk of instability or failure within the on-site embankment along the northern boundary leading down from the railway and the need for any mitigation measures such as piled foundations to transfer loadings below the base of the slope.

6.20. CONSTRUCTION ACTIVITY AND INSPECTION

The following activities and inspections should be incorporated in to the site works:

- Due to the variability of the soils at the site, it is recommended that sufficient allowance is made for the inspection of formations and sub formations to foundations and pavement construction.

- Excavations where access is required should be subject to a risk assessment from a competent person and, where appropriate, mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA R97 should be utilised.

- It is considered that dewatering is likely to be required, especially following periods of heavy rainfall. Removal of surface water and water within trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids are likely to be required and consideration should be given to provision of space for settling tanks or an attenuation pond.

- Where access to confined spaces is required, appropriate mitigation measures should be addressed within the construction stage health and safety plan. Particular account should be taken of the gas results.

- The presence of potential contamination and mitigation measures should be addressed as part of the construction stage health and safety plan and should include measures to design out the risks, reduce their impact and, finally, to include the use of personnel protective equipment (PPE).

Table 41, overleaf, provides a geotechnical risk register for the site.

6.21. DEVELOPED GEOTECHNICAL RISK REGISTER

Table 41 Geotechnical Risk Register

POTENTIAL ABNORMAL CONSTRAINT	LOCATION ON SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Remediation of contaminated soils	WS109 (south west) and WS118 (central)	10	short chain aromatic TPHs C12-16, these present a potential volatilisation to indoor air risk. These elevated concentrations were identified within the shallow made ground soils (<1 m bgl) in two locations during the investigation in 2019. TPH C12-C16 impact has been identified within WS109 (south west) and WS118 (central) and is linked to parking locations of heavy goods vehicles (HGVs). Following the removal of the on-site source (HGVs) volatile TPH impact within these areas should be subject to delineation and further validation to assess chemical suitability for retention on site in an area of no future sensitivity or removal from site. Heavy metals and non volatile PAHs are noted throughout the Made Ground and should be mitigated by cover systems.
Obstructions	Beneath current and historic structures	40	In the centre of the site an obstruction was encountered which is likely to be associated with the footing of the historic footbridge. No further obstructions were noted during the site investigation. Brick cobbles and shallow obstructions were encountered throughout the site during the initial investigation in 2019 due to collapsing of boreholes. Obstructions from foundations and floor slabs are anticipated beneath current and historical structures on site.
Artificially levelled and filled platforms	Site Wide	100	The site appears to have been levelled and artificially backfilled circa 1960 to create the current development platform.
Retaining walls	Northern boundary and East of the site	25	A retaining wall and slope are present along the northern boundary along the railway embankment supporting active Network Rail infrastructure. A further retaining wall is present separating the warehouses in the east from the remainder of the site in the west, placing the eastern sector at circa 1.00m lower level than the west.
Mature trees	Northern Slope	35	Arboriculture survey required to determine areas of potential tree influence. The site is predominantly surfaced by hardstanding, however a number of semi mature trees are present in throughout the northern slope.
Volume change potential clay	On site	100	The site is underlain by cohesive soils. Should cohesive soils have been assessed as being of low and medium volume change potential, therefore heave precautions will be necessary.
Running sands	N/A	N/A	Data searches indicate low risk.

POTENTIAL ABNORMAL CONSTRAINT	LOCATION ON SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Ground dissolution	N/A	N/A	Data searches indicate no hazard.
Concrete design	On site	100	Concrete classification for the majority of the site will be DS1 AC1s. Elevated sulphates have been identified within WS202 and WS208 within deeper deposits with a classification of DS-3, AC-2s and DS-2, AC-1s respectively. Within the 2019 investigation concrete classification was classified as DS1 AC1s across the site.
Low-permeability ground	Site Wide	100	Soakaway tests have been undertaken in line with BRE 365. During the tests the water level did not fall below the 75% or 25% effective storage depth over a period of 48 hours, as such the test was deemed to have failed. The site is underlain by stiff CLAY to a depth of 15.00 m bgl. Due to the presence of underlying cohesive soils and given that the water level did not drop to the required effective depths during BRE permeability testing (indicating poor drainage conditions), it is considered that soakaway drainage will not be feasible at the subject site.
Services/sensitive structures	Site Wide	65	An electricity cable was identified within the south western car park, orientated east to west towards Briscoe Lane. A review of online records held by United Utilities indicates the presence of a combined sewer located to the central southern boundary and an abandoned sewer present along the western boundary. A control kiosk and sewer overflow infrastructure are also present adjacent to the western boundary. A water pipe was also identified along the northern retaining wall structure in the western parcel. An electrical substation and a transformer to the south of the site within the gatehouse off Riverpark Road in the western sector of the site is present. This internal infrastructure is not marked on the publicly available utility plans, however, anecdotal evidence from site workers notes a substation to be located within the MODA furniture building, likely associated with the communication tower. Piling may not be possible within close proximity to any sensitive infrastructure.
Abnormal foundation solutions	Site Wide	100	Upon completion of these remediation works it is likely that the most cost effective option for the majority of the site would be to remediate and re-engineer the Made Ground to facilitate Ground Improvements by Vibro Stone Columns (VSC) that will ensure a uniform ABP in the order of 100kN/m^2. The exception to VSC or standard foundations would be in the location of the proposed four storey apartment buildings, plots within tree influence and plots within influencing distance of retaining structures. Dependent on loadings, plots in these areas are likely to require a driven pile foundation.

POTENTIAL ABNORMAL CONSTRAINT	LOCATION ON SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Areas not investigated	Beneath self storage, MODA and western structures	35	Due to the presence of inaccessible buildings (MODA furniture, self-storage warehouse and western office building) intrusive works were not undertaken within this area.
Historically infilled pond	West	10	A historically infilled pond is recorded within the west of the site. The pond is largely located beneath the western structure. To date, no historic pond base or deleterious material relating to this feature has been identified.
Quarry high wall	South West and East	20	Depth of Made Ground is variable across the site. Potential high walls have been located in the south west and east of the site associated with infilling of historic features. Turnover of Made Ground soils to top of natural and upfill of material to a suitable geotechnical design.
Mining	West	0	No areas of potential shallow mine workings have been identified in the conjectured seam outcrop underlying the north western sector of the site or within the coal claim area. Investigation did not identify any potential historical shallow workings.
Slope	Northern boundary	35	A significant embankment is present at the northern boundary leading to Network Rail infrastructure (railway track) in a cutting at the upper elevation of this slope. As and when detailed topographic information is available and in due consideration of the proposed development design, structural and infrastructure loading, a detailed slope stability model will be required.
Consolidation & Settlement	Site Wide	100	The presence of variable historical Made Ground deposits represent a risk associated with the consolidation of materials that could induce unacceptable settlement to structures and infrastructure. Made Ground should be turned over to the top of natural and engineered in line with a suitable geotechnical design.
Enabling Earthworks	Site Wide	100	All proposed earthworks will need to be designed by a suitably qualified geotechnical engineer in accordance with NHBC Chapter 4.6. The earthworks design will incorporate a Geotechnical Specification for Earthworks that will define protocols to ensure no unacceptable future risk.

END OF REPORT

APPENDIX I
LIMITATIONS

1. This report and its findings should be considered concerning the terms of reference and objectives agreed upon between E3P and the client, as indicated in Section 1.3.

2. For the work, reliance has been placed on publicly available data from the sources identified. The information is not necessarily exhaustive, and further information relevant to the Site may be available from other sources. When using the information, it has been assumed that it is correct. No attempt has been made to verify the information.

3. This report has been produced following current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and require advice from legal professionals.

4. During the site walkover, a reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the Site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the Site limited the locations where sampling locations could be installed and the techniques that could be used.

6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and does not constitute or replace full and proper surveys.

8. The report's executive summary, conclusions and recommendations sections provide an overview and guidance only. They should not be relied on explicitly without fully considering the report's context.

9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that it was prepared for. The copyright in this report and other plans and documents designed by E3P is owned by them, and no such plans or documents may be reproduced, published or adapted without written consent. However, complete copies of this may be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied. Still, no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement.

10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II
GLOSSARY

TERMS

ACM	Asbestos-containing material	**MMP**	Materials management plan
ADS	Acoustic design statement	**ND**	Not detected
AST	Above-ground storage tank	**NDP**	Nuclear density probe
BGS	British Geological Survey	**NMP**	Noise management plan
BSI	British Standards Institute	**NPSE**	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	**NR**	Not recorded
CA	Coal Authority	**PAH**	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	**PCB**	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	**PI**	Plasticity index
CIRIA	Construction Industry Research Association	**PID**	Photo ionisation detector
CLEA	Contaminated land exposure assessment	**POS**	Public open space
CML	Council of Mortgage Lenders	**PPE**	Personnel protective equipment
CoC	Contaminants of concern	**ProPG**	Professional practice guidance
CSM	Conceptual site model	**QA**	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	**SGV**	Soil guideline value
DWS	Drinking water standard	**SPH**	Separate-phase hydrocarbon
EA	Environment Agency	**SPT**	Standard penetration test
EQS	Environmental quality standard	**SVOC**	Semi-volatile organic compound
FFL	Finished floor level	**TPH**	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	**TPH CWG**	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	**UKWIR**	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	**UST**	Underground storage tank
HCV	Health criteria value	**VCC**	Vibro-concrete column
ICSM	Initial conceptual site model	**VOC**	Volatile organic compound
LEL	Lower explosive limit	**VRSC**	Vibro-replacement stone columns
LMRL	Lower method reporting limit	**VSC**	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	**WHO**	World Health Organisation

MCV	Moisture condition value	**WRAP**	Waste and Resources Action Programme
MIBK	Methyl isobutyl ketone	**WTE**	Water table elevation
m	Metres	**ppm**	Parts per million
km	Kilometres	**mg/m^3**	Milligram per metre cubed
% v/v	Percent volume in air	**m bgl bgl**	Metres below ground level
mb	Millibars (atmospheric pressure)	**m bcl**	Metre below cover level
l/hr	Litres per hour	**mAOD**	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	**kN/m^2**	Kilonewtons per metre squared
ppb	Parts per billion	**µm**	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	**SSRT**	Site Specific Remediation Target
PSD	Particle Size Distribution	**DD**	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	**Mc**	Moisture Content
ρ	Bulk Density	**GPR**	Ground Penetrating Radar
NDP	Nuclear Density Probe	**FFL**	Finished Floor Level
LEL	Lower Explosive Limit	**UKWIR**	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	**LOD**	Limit of Detection

APPENDIX III
RISK CLASSIFICATION

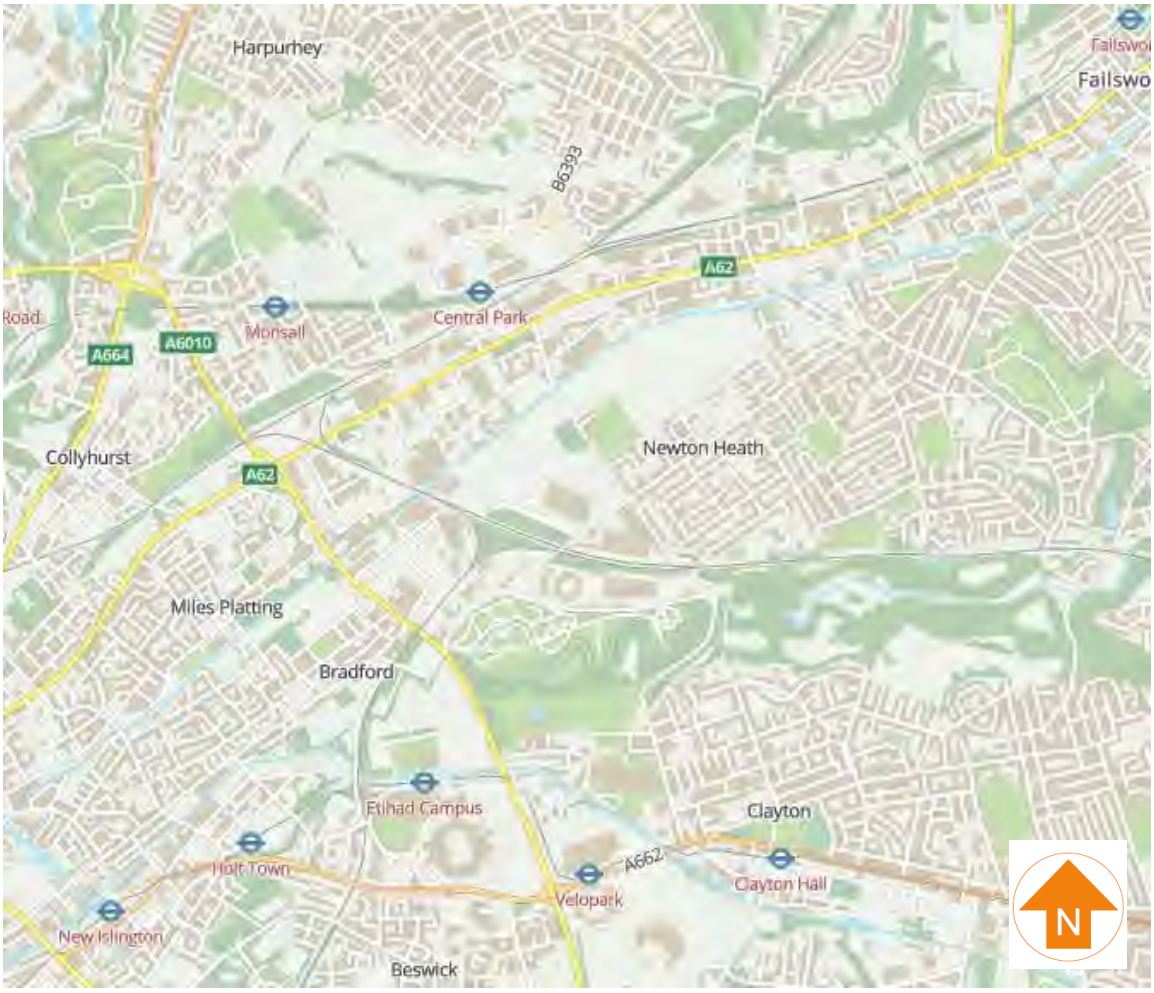
RISK CLASSIFICATION

RISK	DEFINITION
Low	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property.
Low Moderate	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property with regard to the proposed use. However, minor issues may require further consideration in the event of future redevelopment of the Site.
Moderate	Some potential contaminated land liabilities/geotechnical constraints are likely to affect the property as a result of historical and/or current activities. The risks identified are unlikely to pose an immediate significant issue but the purchaser/developer may wish to make further enquiries of the vendor or undertake further environmental improvements. Redevelopment of the Site will likely require further site investigation.
Moderate High	Some potentially significant contaminated land liabilities/geotechnical constraints have been identified at the property that requires further assessment, including intrusive ground investigations.
High	Significant potential contaminated land liabilities/geotechnical constraints have been identified at the property. Further assessment including intrusive ground investigation will be required to determine the level of risk and associated liability.

APPENDIX IV
DRAWINGS

DRAWING 17-246-001 – Site Location Plan





N

Block A (Great Places)
4 storeys - 58 apartments
Plots 222-279

Block B (Great Places)
4 storeys - 46 apartments
Plots 280-325

Block C (PRS)
4 storeys - 69 apartments - Plots 326-394

Block D (PRS)
6 storeys - 58 apartments - Plots 395-452

Block E (PRS)
6 storeys - 46 apartments - Plots 453-498

38no. parking spaces incl. 2no. accessible

52no. parking spaces total inc. 3no. accessible

44no. parking spaces inc. 4no accessible spaces

Existing Retaining Wall To Remain

Existing Retaining Wall To Remain

BRISCOE LANE

RIVERPARK ROAD

RIVERPARK ROAD

Stone Track

SP

MP 0.25

SL

FS

62.2m

61.8m

61.3m

61.3m

57.6m

56.7m

56.1m

53.9m

52.7m

51.5m

Bank Street Bridge

Road 1

Road 2

Road 3

Road 4

Road 5

Road 6

Road 7

Legend

- Indicates 1.8m high feature fence.
- Indicates 1.8m high plot divisional screen fence.
- Indicates 1.8m high closed boarded fence.
- Indicates proposed tree planting subject to a landscape design and specification.
- Indicates principle entrance door to dwelling.
- Indicates secondary entrance door to dwelling.
- Indicates application site boundary.
- Indicated solar lighting column
- Wall mounted electric charging point
- Dual pole mounted electric charging point
- Single pole mounted electric charging point
- Great Places boundary

Accommodation Schedule - Riverpark Road

KELLEN HOMES

Open Market	Bed No.	Type	No.	Sqft	Total Sqft
Apartment Block C, D & E					
PRS Type A	1	Apt	48	538	25824
PRS Type B	1	Apt	16	592	9472
PRS Type C	1	Apt	1	603	603
PRS Type D	2	Apt	67	753	50451
PRS Type E	2	Apt	12	764	9168
PRS Type F	2	Apt	15	775	11625
PRS Type G	2	Apt	3	786	2358
PRS Type H	2	Apt	11	797	8767
		Total	**173**		**118268**
House Types					
Hickory (end)	2	End/ Semi	20	771	15420
Hickory (mid)	2	Mews	8	768	6144
Olive	2	Semi/ Mews	4	771	3084
Acacia	3	Semi/ Mews	4	940	3760
Cedar (end)	3	End/ Semi	14	940	13160
Cedar (mid)	3	Mews	5	938	4690
Spruce (end)	3	End/ Semi	25	1187	29675
Spruce (mid)	3	Mews	13	1183	15379
Foxglove	3	End/ Semi	1	1187	1187
Larch (end)	4	End/ Semi	8	1262	10096
Larch (mid)	4	Mews	9	1257	11313
		Total	**111**		**113908**
		TOTAL OM	**284**		**232176**

Affordable Homes	Bed No.	Type	No.	Sqft	Total Sqft
Apartment Block A					
Type A	1	Apt	48	538	25824
Type B	1	Apt	4	592	2368
Type C	1	Apt	9	603	5427
Type D	2	Apt	3	753	2259
Type E	2	Apt	4	764	3056
Type F	2	Apt	32	775	24800
Type G	2	Apt	4	786	3144
		Total	**104**		**66878**
House Types					
Hickory (end)	2	End/ Semi	24	771	18504
Hickory (mid)	2	Mews	5	768	3840
Olive	2	Semi/ Mews	4	771	3084
ADU-2B	2	Semi/ Mews	2	969	1938
ADU-4B	3	Semi/ Mews	2	1117	2234
Acacia	3	Semi/ Mews	2	940	1880
Linden	3	End/ Semi	3	966	2898
Cedar (end)	3	End/ Semi	10	940	9400
Cedar (mid)	3	Mews	2	938	1876
Aspen (end)	3	End/ Semi	11	966	10626
Aspen (mid)	3	Mews	2	963	1926
Spruce (end)	3	End/ Semi	15	1187	17805
Spruce (mid)	3	Mews	17	1183	20111
Foxglove	3	End/ Semi	1	1187	1187
Larch (end)	4	End/ Semi	4	1262	5048
Larch (mid)	4	Mews	6	1257	7542
		Total	**110**		**109899**
		TOTAL AH	**214**		**176777**
		SITE TOTAL	**498**		**408953**

0 2.5 5 10 15 25 m

SCALE BAR 1:500

Revision	Date	Amendment	Initials
Q	25.03.2025	Bike stores added to rear gardens	TW
P	14.03.2025	Apartment block label corrected	TW
O	13.03.2025	Plots 62-67 outlined for Cedars & Acacias & accommodation schedule updated to match Blossom renamed to Foxglove Gates to accesses off Riverpark Road added Hatch removed from apartment blocks	TW
N	12.03.2025	Plots 8, 196 & 210 subbed to Blossoms Cycle bins updated	TW
M	11.03.2025	Duetder corner turner renamed to Blossom Hedge, gates, benches and bins added to POS area Bin storage areas removed	TW
L	10.03.2025	Duetder corner turner type added and accommodation schedule updated	TW
K	07.03.2025	Spruce corner turner and updated ADU type footprints added Apartment block bin accesses updated and ped. gates added	TW
J	06.03.2025	Road 7 reduced to turning head and shared private drive added Apartment handing and access updated	TW
I	04.03.2025	Cycle lane added Rain gardens and SuDS pond added and boundary treatments updated Approved Part S Car charging clear zone areas added	TW
H	24.02.2025	Apartment floor-plates added and accommodation schedules added	TW
G	21.02.2025	Apartment accommodation schedule updated	TW
F	21.02.2025	Apartment accommodation schedule added	TW
E	20.02.2025	- Electric charging points added - Various plots handed correctly - Various plots' accesses re-aligned - Key updated	TW
D	20.02.2025	- Apartment sizes and surrounding area updated - Sub station locations updated	TW
C	17.02.2025	- Affordable housing tenure split accommodation schedule updated - Existing retaining wall updated	TW
B	07.01.2025	Apartment blocks & accommodation schedules updated	TW
A	07.01.2025	GP legal boundaries changed plots 182 and 183.	RGC

Development
Riverpark Road

Location
Manchester

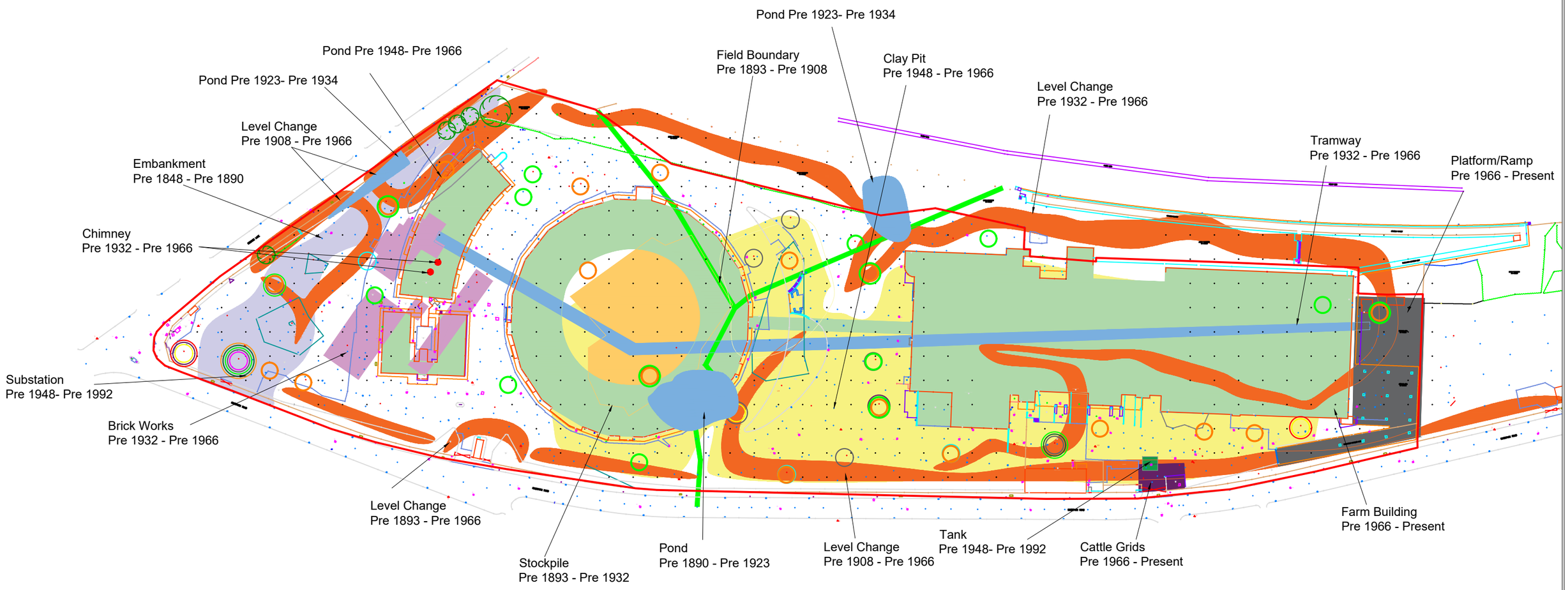
Marketing Name
-

Drawing Title
Detailed Site Layout

Job No.	Drawing No.
KH012	A-100
Revision	Scale @ A0
Q	1:500
Drawn By	Date
TW	03.02.25
Checked by	Date Checked
-	-

1st Floor, 103 Dalton Avenue, Birchwood Park, Warrington WA3 6YE
T: 01925 363108 W: www.kellenhomes.com
KELLEN HOMES

Z:\012 Riverpark, Manchester\01. Architects\02. Drawings\100 - Layout\Planning Layout\Riverpark Road - Planning Layout.dwg



Historical Features

- Stockpile
- Field Boundary
- Level Change
- Clay Pit
- Chimney
- Tramway
- Brickworks
- Platform
- Farm Buildings
- Cattle Grid
- Pond
- Substation
- Tank
- Ponds
- Embankment

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVC	21.11.2024	TG	MD	MD
P1	REVB	16.05.2024	OW	MD	MD
P1	REVA	12.02.2024	EB	MD	MD

Client: Kellen

Job Title: Riverpark

Job No: 17-246

Date: 21.11.2024

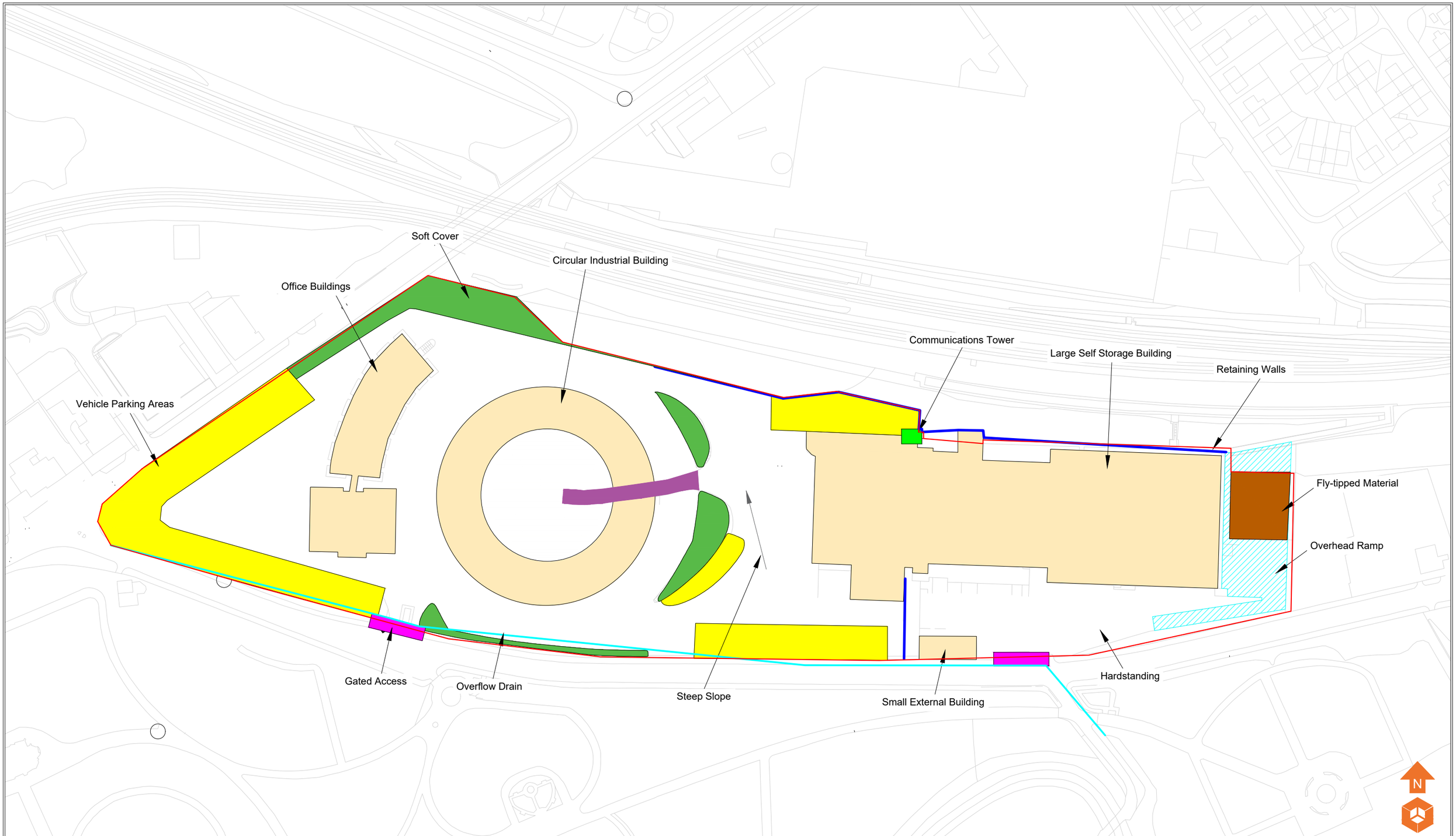
Drawing No: 003

Scale: NTS @ A3

Drawing Title: Historical Features Plan

Environmental Engineering Partnership Ltd
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
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Website: www.e3p.co.uk

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Site Features

- Buildings
- Steep Slope
- Hardstanding
- Soft Cover
- Fly-tipped Materials
- Communications Tower
- Overhead Ramp
- Vehicle Parking Areas
- Retaining Walls
- Overflow Drain
- Underpass

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVD	21.11.2024	TG	MD	MD
P1	REVC	16.05.2024	OW	MD	MD
P1	REVB	01.03.2024	OW	LC	MD
P1	REVA	29.02.2024	OW	LC	MD

Client: Kellen

Job Title: Riverpark

Job No: 17-246

Date: 21.11.2024

Drawing No: 004

Scale: NTS @ A3

Drawing Title: Site Features Plan

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Location Symbols

- Approximate Window Sample Probehole Location (E3P November 2019)
- Approximate Window Sample Probehole Location with Install (E3P November 2019)
- Approximate Trial Pit Location (E3P November 2019)
- Approximate Cable Percussive Borehole Location (E3P November 2019)
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- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Window Sample Probehole Location (E3P January 2024)

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVD	21.11.2024	TG	MD	MD
P1	REVC	19.03.2024	EB	GC	MD
P1	REVB	12.02.2024	EB	MD	MD
P1	REVA	26.01.2024	OW	LC	MD

Client: Kellen

Job No: 17-246

Date: 21.11.2024

Drawing No: 006

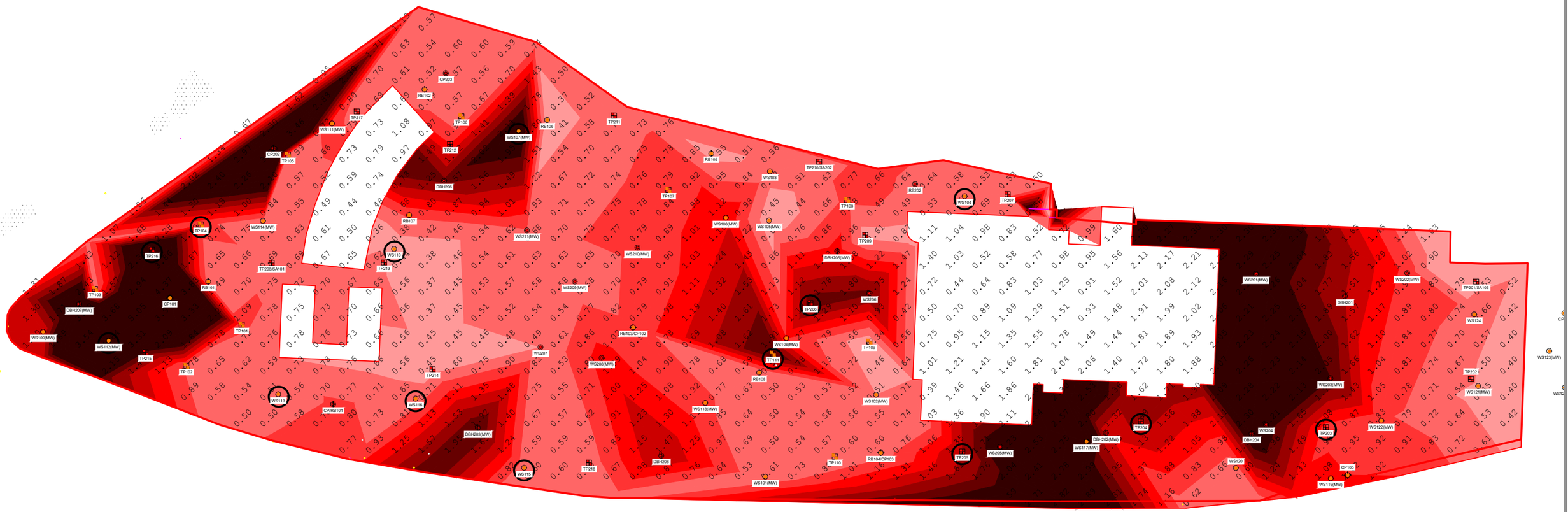
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Job Title: Riverpark

Drawing Title: Exploratory Hole Location Plan

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Tel: 0161 707 9612
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- Approximate Soakaway Test Location (E3P January 2024)
- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Window Sample Probehole Location (E3P January 2024)

Made Ground Depth (m)

- Depth of Made Ground 0.25 - 0.49m
- Depth of Made Ground 0.50 - 0.74m
- Depth of Made Ground 0.75 - 0.99m
- Depth of Made Ground 1.00 - 1.24m
- Depth of Made Ground 1.25 - 1.49m
- Depth of Made Ground 1.50 - 1.74m
- Depth of Made Ground 1.75 - 1.99m
- Depth of Made Ground >2.00m
- Base of Made Ground Not Encountered

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVD	26.02.2025	TG	MD	MD
P1	REVC	21.11.2024	TG	MD	MD
P1	REVB	14.02.2024	EB	MD	MD
P1	REVA	12.02.2024	EB	MD	MD

Client: Kellen

Job No: 17-246

Date: 21.11.2024

Drawing No: 006

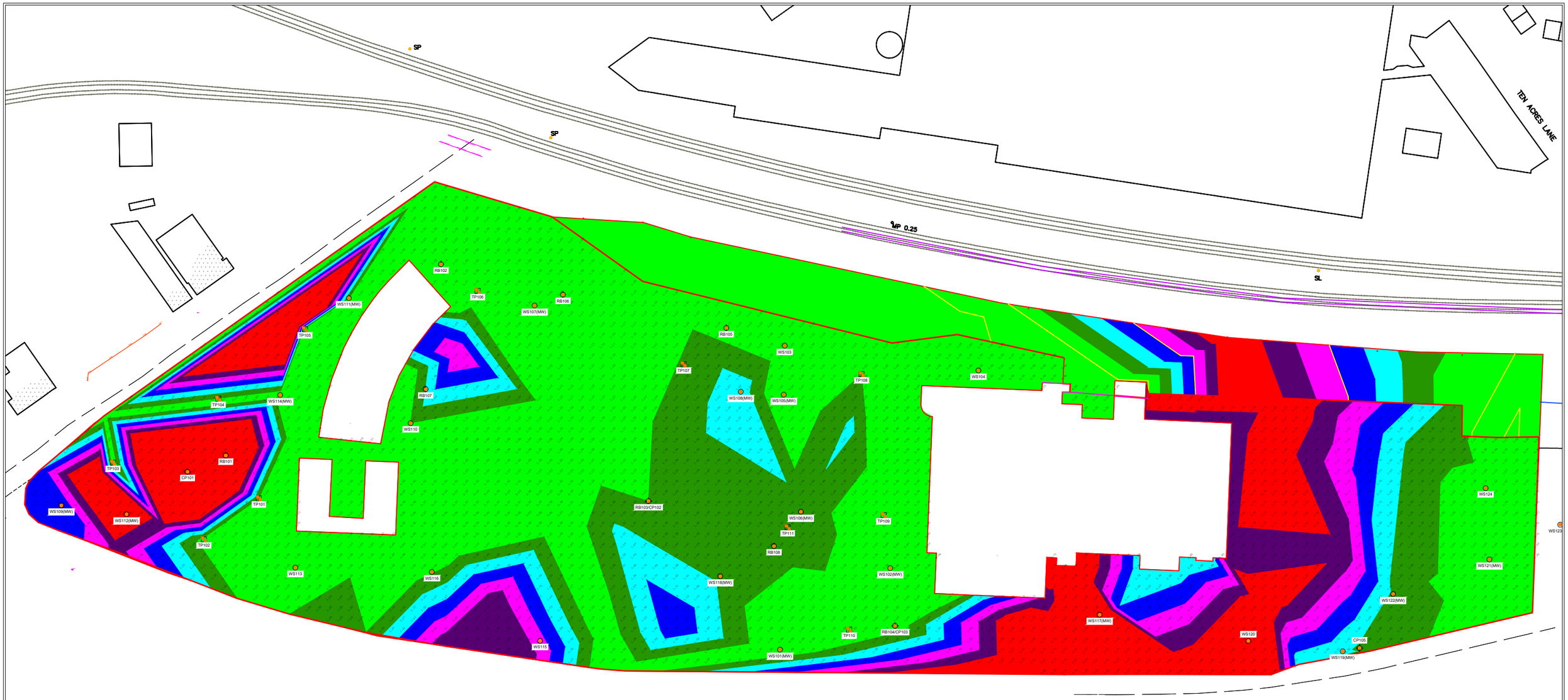
Scale: NTS @ A3

Job Title: Riverpark

Drawing Title: Depth of Made Ground Plan

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- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Window Sample Probehole Location (E3P January 2024)

Shallow Spread Footings

- Depth to Founding Strata 0.00 - 1.24m
- Depth to Founding Strata 1.25 - 1.49m

Mass Trench Fill Footings

- Depth to Founding Strata 1.50 - 1.74m
- Depth to Founding Strata 1.75 - 1.99m
- Depth to Founding Strata 2.00 - 2.24m

Engineered Footings

- Depth to Founding Strata 2.25 - 2.49m
- Depth to Founding Strata >2.50m

Notes:

Depth to Founding Strata does not Consider Anthropogenic Influence or Trees and is an Indicative Assessment

Phase	Issue	Date	Drawn	Checked	PM
P1	REVD	26.02.2025	TG	MD	MD
P1	REVC	21.11.2024	TG	MD	MD
P1	REVB	14.02.2024	EB	MD	MD
P1	REVA	12.02.2024	EB	MD	MD

Client: Kellen

Job Title: Riverpark

Job No: 17-246

Date: 26.02.2025

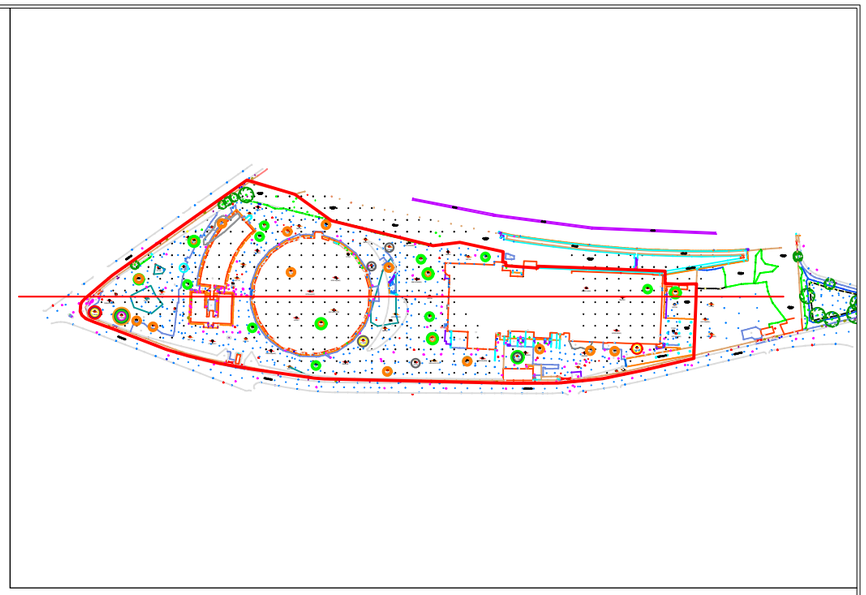
Drawing No: 008

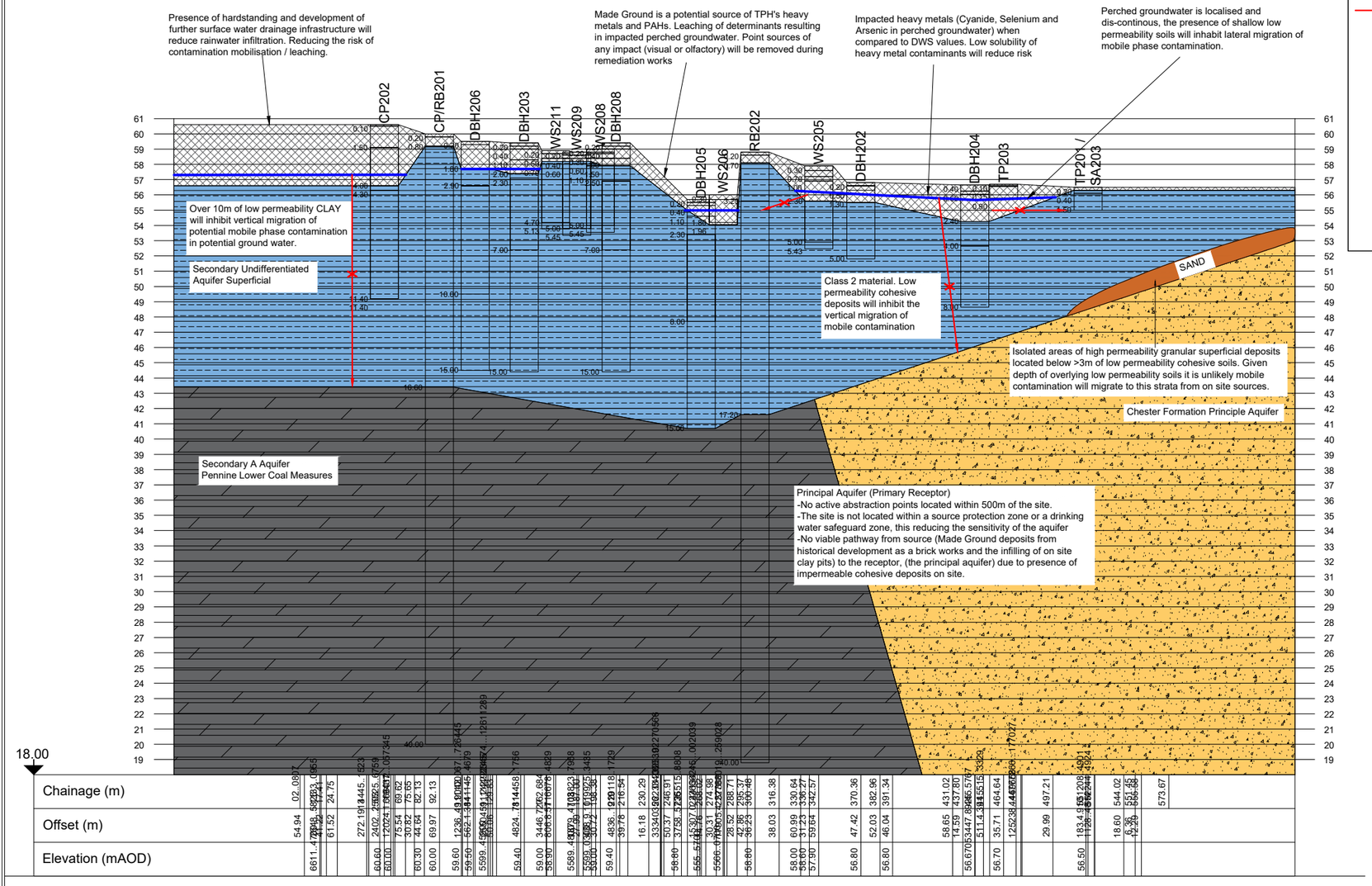
Scale: NTS A3

Drawing Title: Depth to Founding Strata Plan

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Geology Key

- Made Ground
- Superficial Deposits
- Chester Formation
- Pennie Lower Coal Measures
- Groundwater
- Pathways
- Pathway Interrupted

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVE	21.11.2024	TG	MD	MD
P1	REVD	16.05.2024	OW	MD	MD
P1	REVC	08.04.2024	OW	MD	MD
P1	REVB	19.03.2024	EB	GC	MD
P1	REVA	18.03.2024	EB	GC	MD

Client: Kellen

Job No: 17-246

Date: 21.11.2024

Drawing No: 010

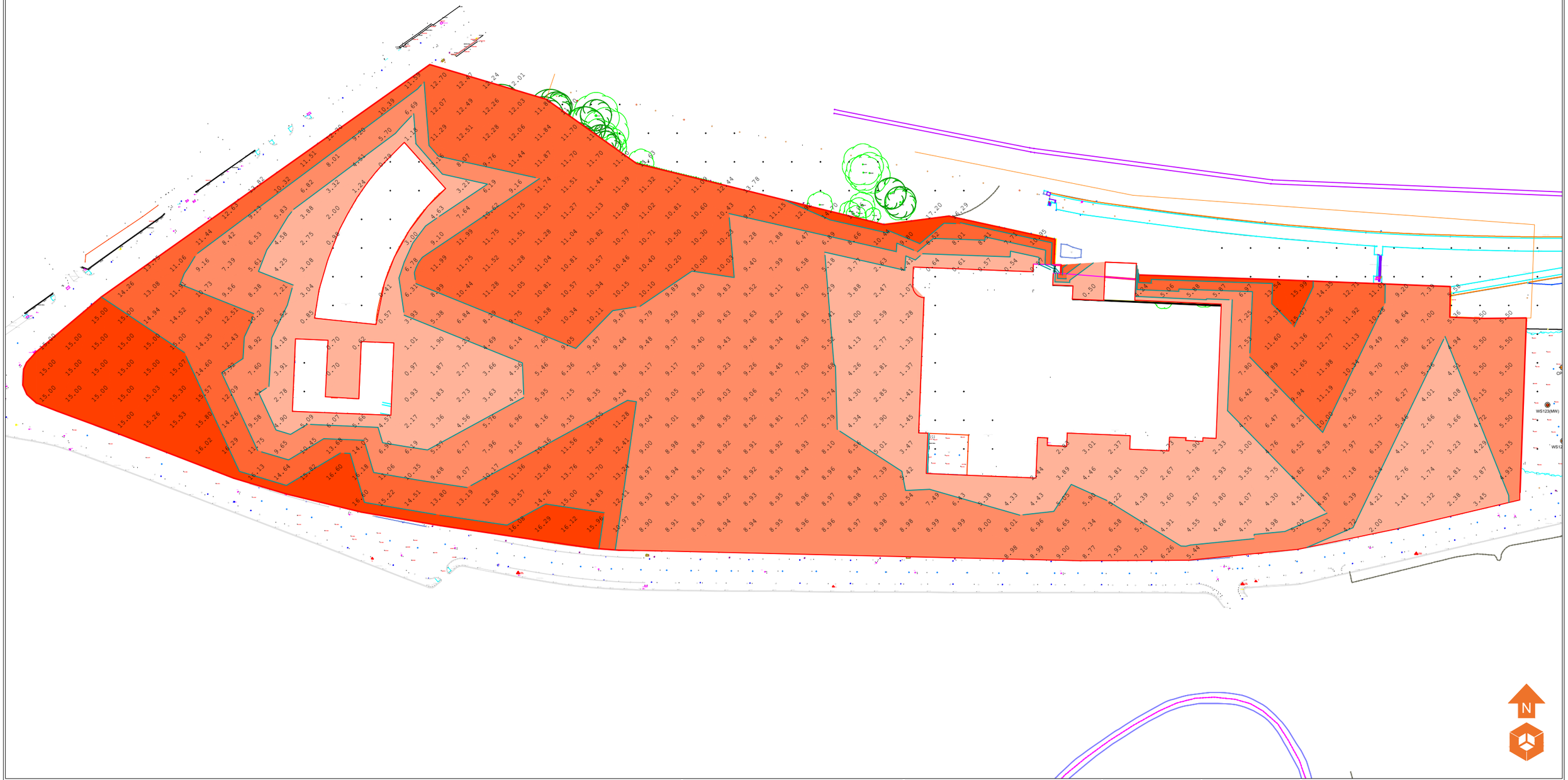
Scale: NTS

Job Title: Riverpark

Drawing Title: Controlled Waters Conceptual Site Model

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Location Symbols

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- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Window Sample Probehole Location (E3P January 2024)

Bedrock Depth (m)

- Depth to Bedrock 0.00 - 4.99M
- Depth to Bedrock 5.00 - 9.99M
- Depth to Bedrock 10.00 - 14.99M
- Depth to Bedrock <15.00M

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVB	21.11.2024	TG	MD	MD
P1	REVA	12.02.2024	EB	MD	MD

Client: Kellen

Job Title: Riverpark

Job No: 17-246

Date: 21.11.2024

Drawing No: 012

Scale: NTS @ A3

Drawing Title: Depth to Bedrock Plan

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Urmston, Manchester, M41 7JQ
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Website: www.e3p.co.uk

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Development Constraints

- Public Sewer
- Inaccessible Building
- Vehicle Parking Areas
- LP Gas Main
- Overhead Ramp
- Potential Chimney Base Obstruction
- Abandoned United Utilities Head System
- Retaining Walls
- Underpass
- Japanese Knotweed

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVG	21.11.2024	TG	MD	MD
P1	REVF	09.04.2024	OW	MD	MD
P1	REVE	21.03.2024	EB	MD	MD
P1	REVD	01.03.2024	OW	LC	MD
P1	REVC	29.02.2024	OW	LC	MD
P1	REVB	27.02.2024	OW	MD	MD
P1	REVA	26.01.2024	OW	LC	MD

Client: Kellen

Job No: 17-246

Date: 21.11.2024

Drawing No: 015

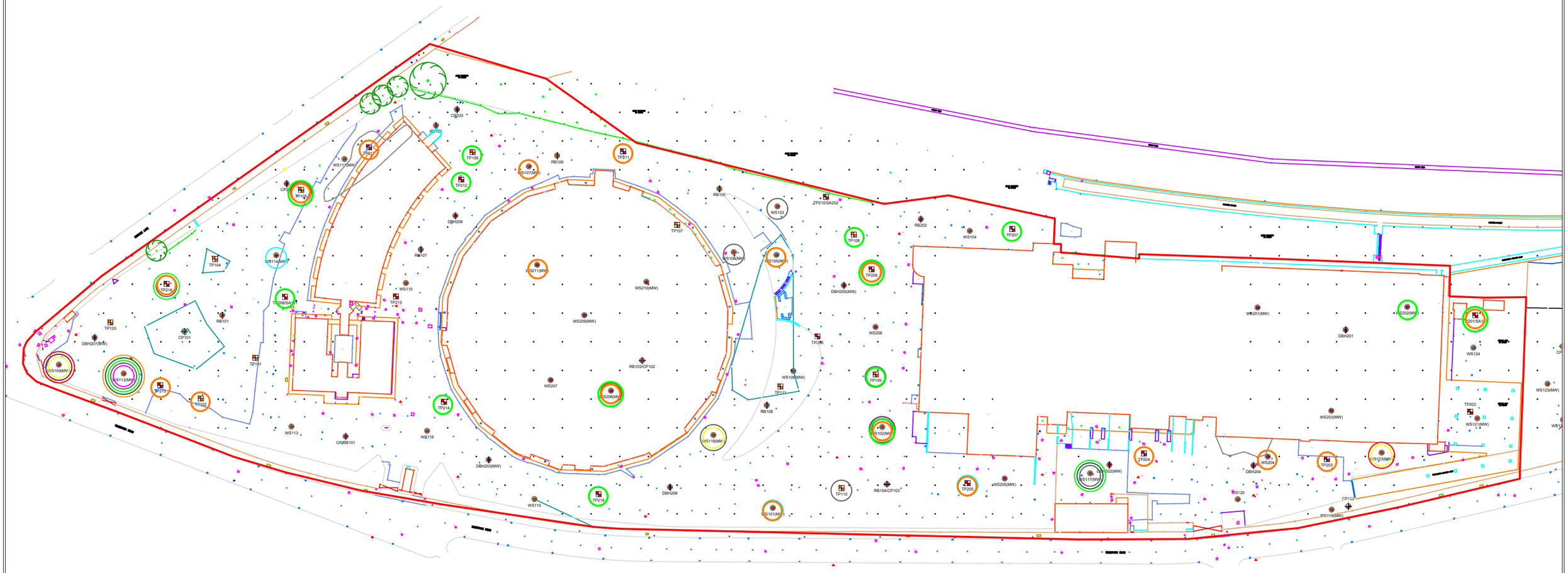
Scale: NTS@ A3

Job Title: Riverpark

Drawing Title: Development Constraints Plan

Environmental Engineering Partnership Ltd
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
Website: www.e3p.co.uk

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Location Symbols

- Approximate Window Sample Probehole Location (E3P November 2019)
- Approximate Window Sample Probehole Location with Install (E3P November 2019)
- Approximate Trial Pit Location (E3P November 2019)
- Approximate Cable Percussive Borehole Location (E3P November 2019)
- Approximate Rotary Borehole Location (E3P November 2019)
- Approximate Window Sample Probehole Location with Install (E3P January 2024)
- Approximate Trial Pit Location (E3P January 2024)
- Approximate Soakaway Test Location (E3P January 2024)
- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Window Sample Probehole Location (E3P January 2024)

Contamination Exceedances

- Arsenic
- Lead
- Asbestos
- Benzo(a) Anthracene
- Benzo(b) Flurathene
- Benzo(a) Pyrene
- Dibenzo(a,h) Anthracene
- TPH C12-C16
- TPH C16-C21
- TPH C21-C35

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVB	21.11.2024	TG	MD	MD
P1	REVA	19.03.2024	EB	GC	MD

Client: Kellen

Job Title: Riverpark

Job No: 17-246

Drawing No: 018

Date: 21.11.2024

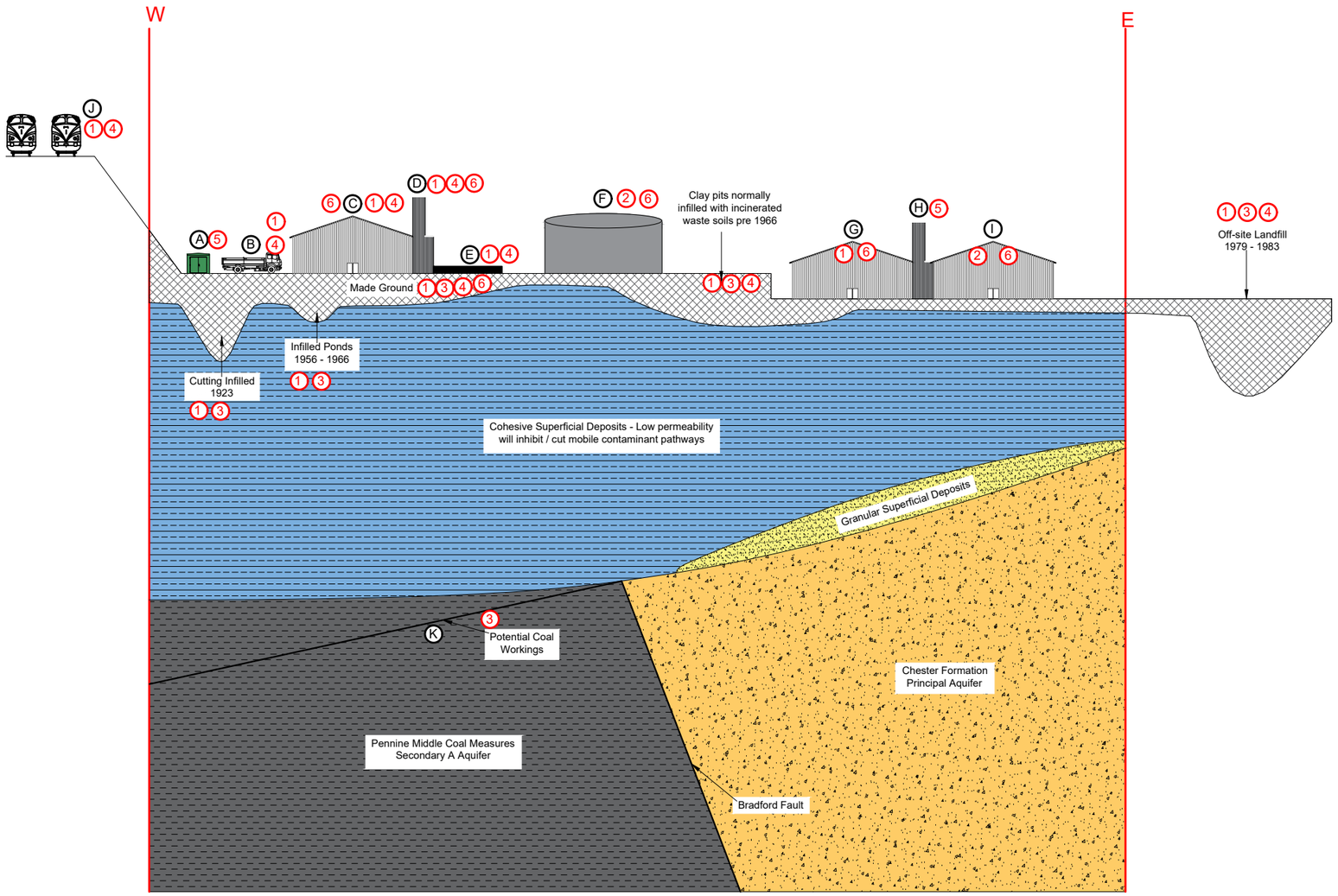
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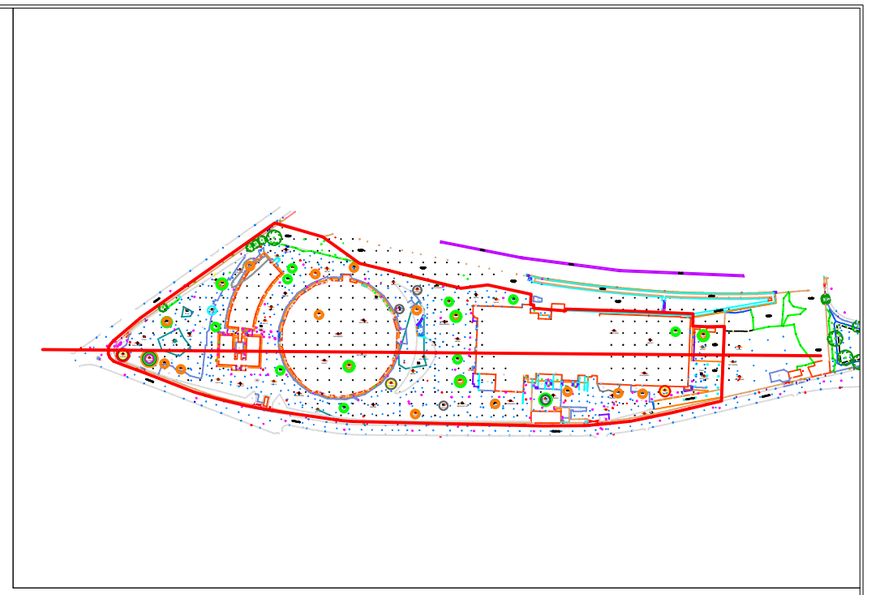
Drawing Title: Contamination Issues Plan

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Current / Historic Uses





Geology Key

- Made Ground
- Cohesive Superficial Deposits
- Chester Formation Principle Aquifer
- Granular Superficial Deposits
- Pennine Middle Coal Measures

Potential Contaminants

1. Heavy Metals, Non Volatile PAH's, Non Volatile TPH's
2. Biological Pathogens
3. Ground Gas
4. Volatile Contaminants (TPH C5 - C12), Napathalene, BTEX
5. PCB's
6. Asbestos

Mitigation Measures

- A Substation
- B Lorry (HGV) Park
- C Former Brickworks
- D Chimney
- E Former Tramway
- F Butchers
- G Current Commercial Activites
- H Communication Tower
- I Former Abattoir
- J Off-site Railway & Rail Infrastructure
- K Potential Coal Workings

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVE	21.11.2024	TG	MD	MD
P1	REVD	16.05.2024	OW	MD	MD
P1	REVC	20.03.2024	EB	MD	MD
P1	REVB	19.03.2024	EB	GC	MD
P1	REVA	15.03.2024	EB	GC	MD

Client: Kellen

Job No: 17-246

Date: 21.11.2024

Drawing No: 027

Scale: NTS

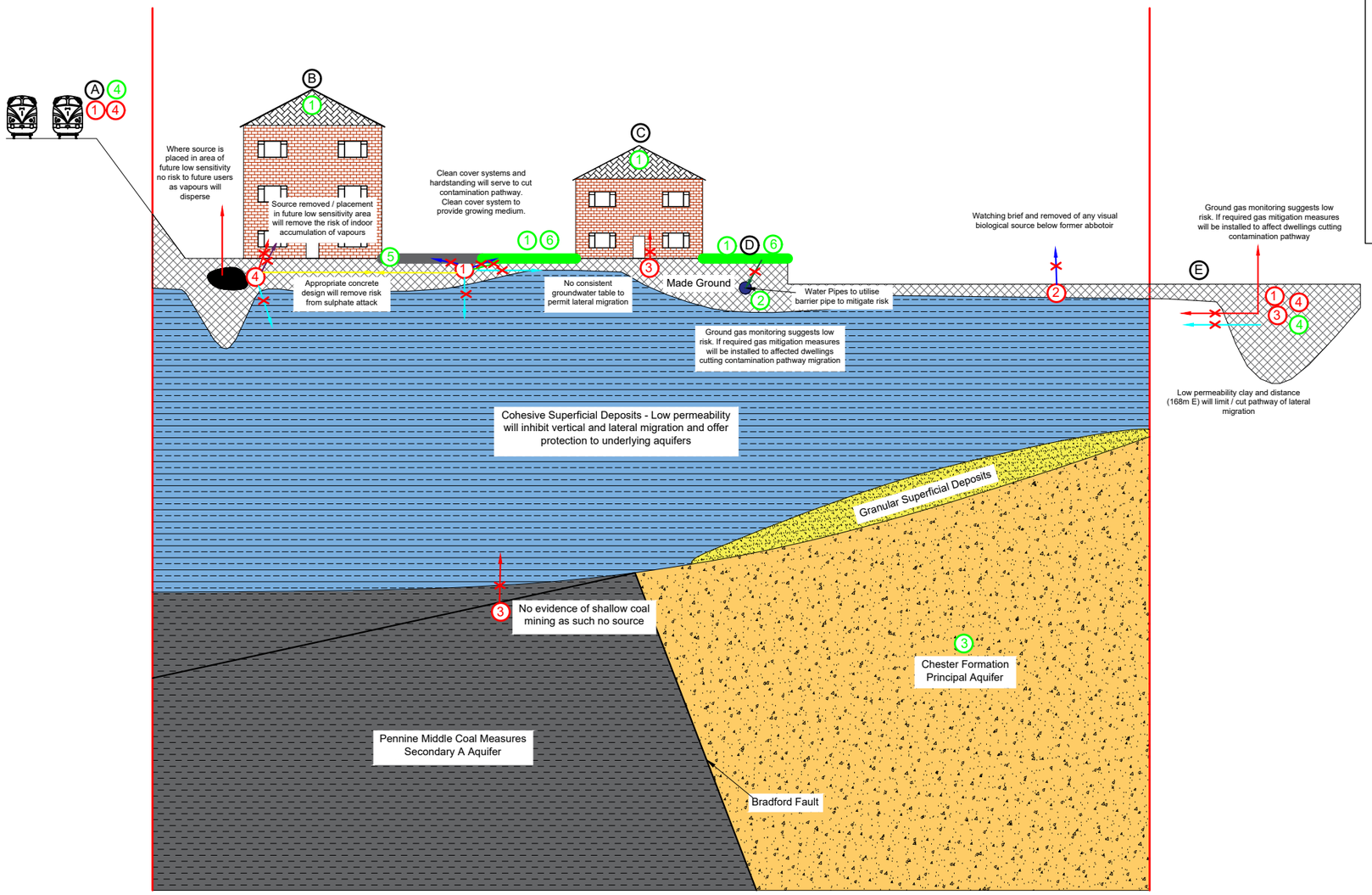
Job Title: Riverpark

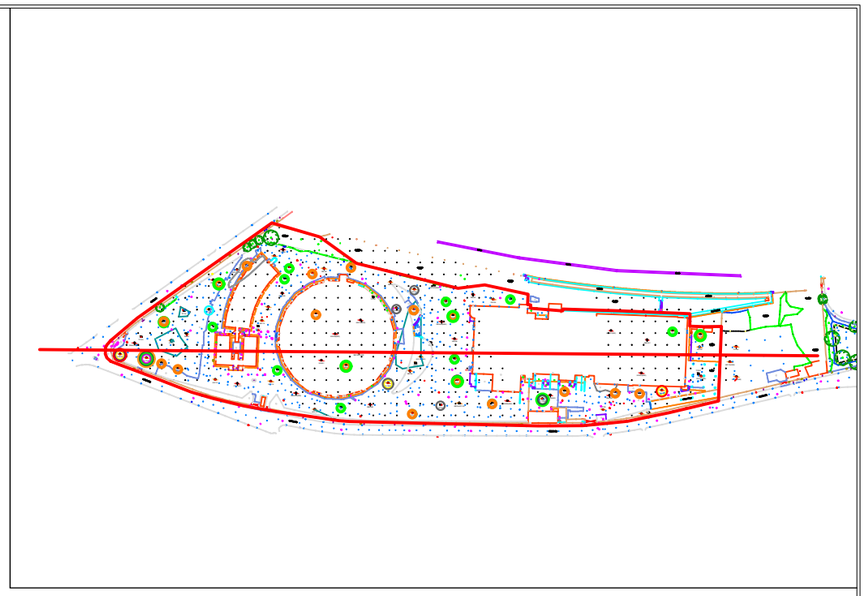
Drawing Title: Human Health Conceptual Site Model

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Residential End Use





Geology Key

- Made Ground
- Cohesive Superficial Deposits
- Chester Formation Principle Aquifer
- Granular Superficial Deposits
- Pennine Middle Coal Measures
- Pathway Interrupted

Potential Contaminants

1. Heavy Metals, Non Volatile PAH's, Non Volatile TPH's
2. Biological Pathogens
3. Ground Gas
4. Volatile Contaminants (TPH C5 - C12), Napathalene, BTEX
5. PCB's
6. Asbestos

Pathways

- Dermal Contact / Ingestion
- Vapour Inhalation
- Inhalation / Accumulation
- Tainting of Water Supplies
- Dust Inhalation
- Vertical / Lateral Migration
- Sulphate Attack on Concrete
- Plant Uptake

Receptors

1. Future End Users
2. Water Pipes
3. Groundwater (Principal Aquifer)
4. Off-site Receptors
5. Building Structure
6. Flora

Mitigation Measures

- A Off-site Railway & Rail Infrastructure
- B Appartment Block
- C Low Rise
- D Site Cover / Private Gardens
- E Off-site Landfill

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVD	21.11.2024	TG	MD	MD
P1	REVC	16.05.2024	OW	MD	MD
P1	REVB	19.03.2024	EB	GC	MD
P1	REVA	15.03.2024	EB	GC	MD

Client: Kellen

Job No: 17-246

Date: 21.11.2024

Drawing No: 028

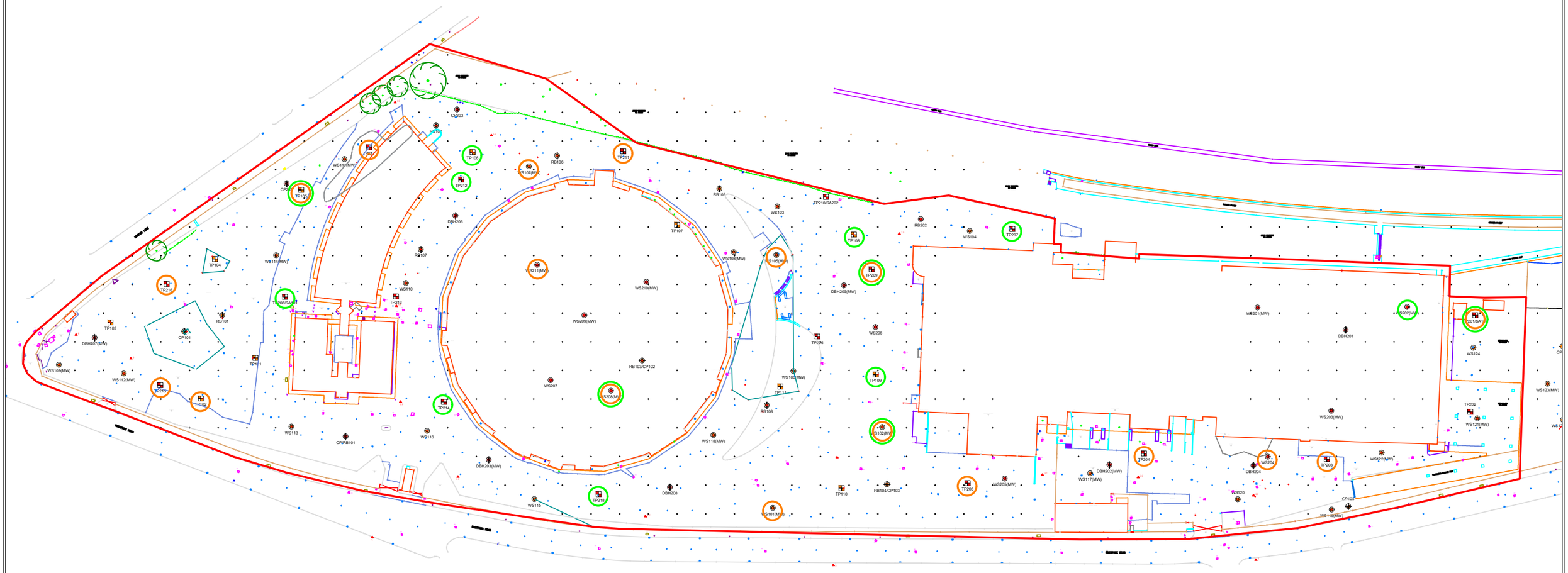
Scale: NTS

Job Title: Riverpark

Drawing Title: Human Health Conceptual Site Model

Environmental Engineering Partnership Ltd
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Urmston, Manchester, M41 7JQ
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Location Symbols

- Approximate Window Sample Probehole Location (E3P November 2019)
- Approximate Window Sample Probehole Location with Install (E3P November 2019)
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- Approximate Rotary Borehole Location (E3P November 2019)
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- Approximate Soakaway Test Location (E3P January 2024)
- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Cable Percussive Borehole Location (E3P January 2024)
- Approximate Window Sample Probehole Location (E3P January 2024)
- Made Ground Sample Location
- Natural Sample Location

Notes:

Phase	Issue	Date	Drawn	Checked	PM
P1	REVB	21.11.2024	TG	MD	MD
P1	REVA	08.04.2024	OW	MD	MD

Client: Kellen

Job No: 17-246

Date: 21.11.2024

Drawing No: 029

Scale: NTS @ A3

Job Title: Riverpark

Drawing Title: Sampling Location Plan

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Urmston, Manchester, M41 7JQ
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APPENDIX V
PHOTOGRAPHS

PLATE 1 EASTERN WAREHOUSE WALL CORE 101 (LEFT) AND 102 (RIGHT)



PLATE 2 EASTERN WAREHOUSE WALL CORE 103



PLATE 3 EASTERN AREA OF SITE (LOOKING EAST)



PLATE 4 SMALL RETAINING WALL IN THE EAST OF THE SITE



PLATE 5 INSIDE EASTERN WAREHOUSE

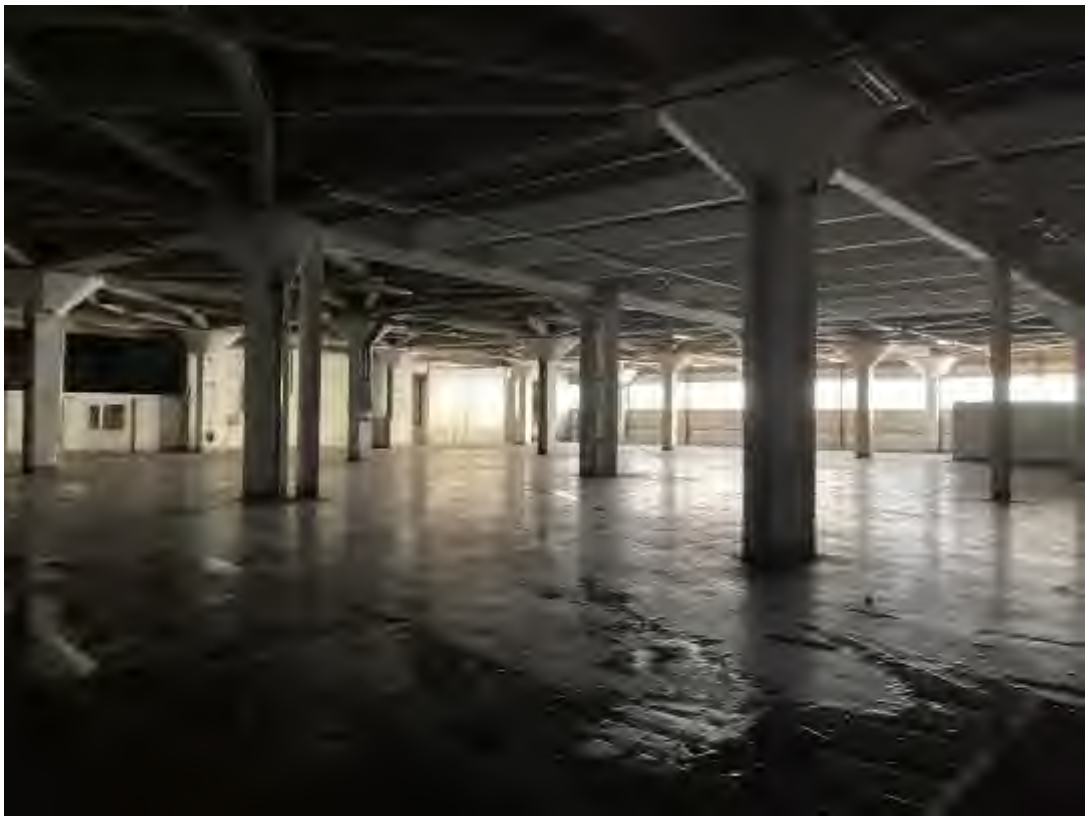


PLATE 6 SLOPE IN THE CENTRE OF THE SITE



PLATE 7 UNDERPASS IN THE CENTRE OF THE SITE



PLATE 8 SLOPE ALONG THE NORTHERN BOUNDARY



PLATE 9 INSIDE THE CENTRAL BUILDING ON SITE



PLATE 10 WS201 (LEFT) AND WS202 (RIGHT)





PLATE 11 WS203 (LEFT) AND WS204 (RIGHT)



PLATE 12 WS205 (LEFT) AND WS206 (RIGHT)



PLATE 13 WS207 (LEFT) AND WS208 (RIGHT)



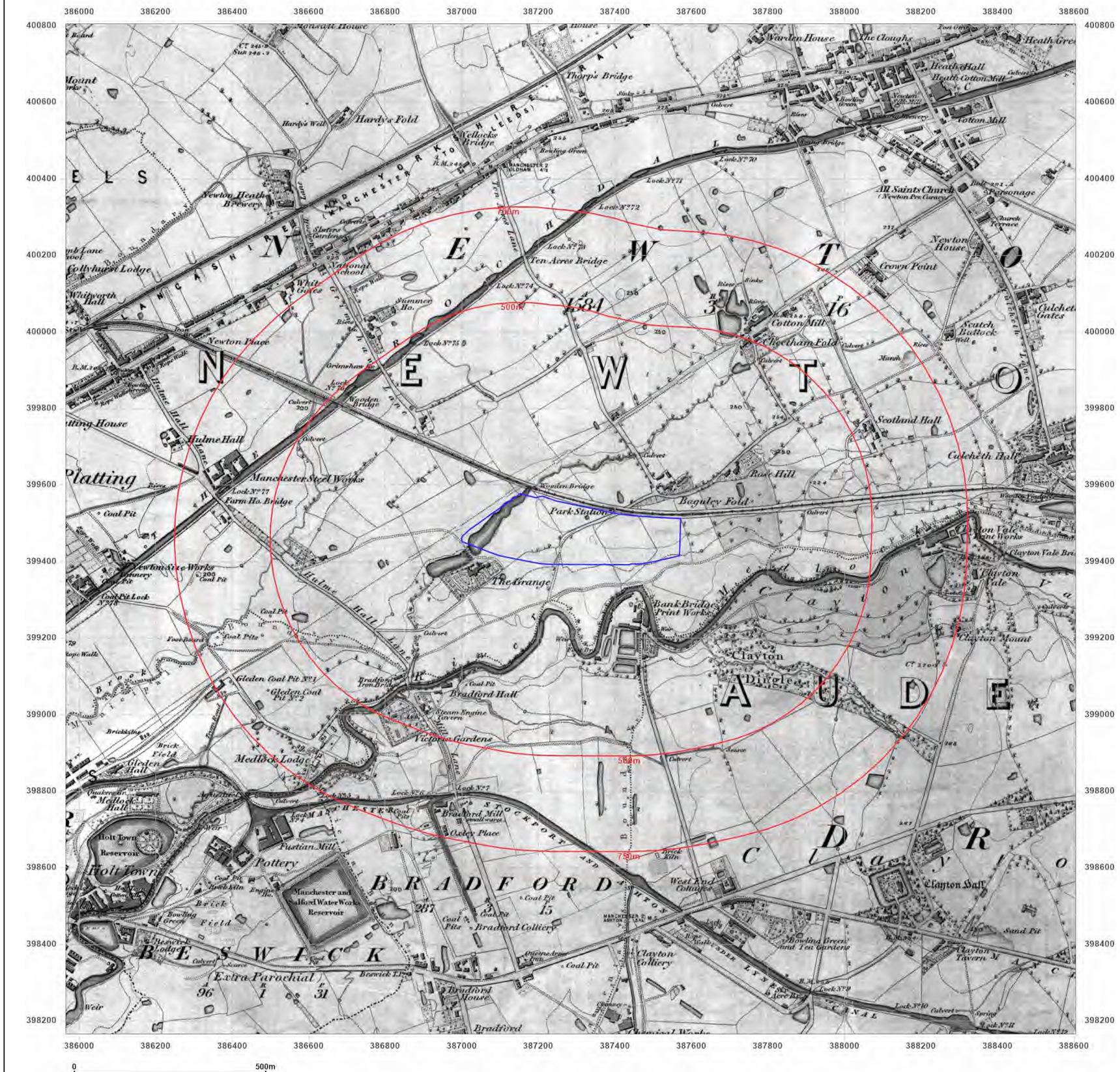
PLATE 14 WS209 (LEFT) AND WS210 (RIGHT)



PLATE 14 WS210 (LEFT) AND WS211 (RIGHT)



APPENDIX VI
HISTORICAL MAPS



Groundsure INSIGHTS

Site Details:

RIVERPARK ROAD,
MANCHESTER, M40 2XP

Client Ref: 007231
Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: County Series

Map date: **1848**

Scale: 1:10,560

Printed at: 1:10,560

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Client Ref: 007231
Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: County Series

Map date: **1890-1891**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1891
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Edition 1891
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Surveyed 1890
Revised 1890
Edition 1890
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Client Ref: 007231
Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: County Series

Map date: **1905-1906**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1906
Edition 1906
Copyright N/A
Levelled N/A

Surveyed 1844
Revised 1905
Edition 1905
Copyright N/A
Levelled N/A

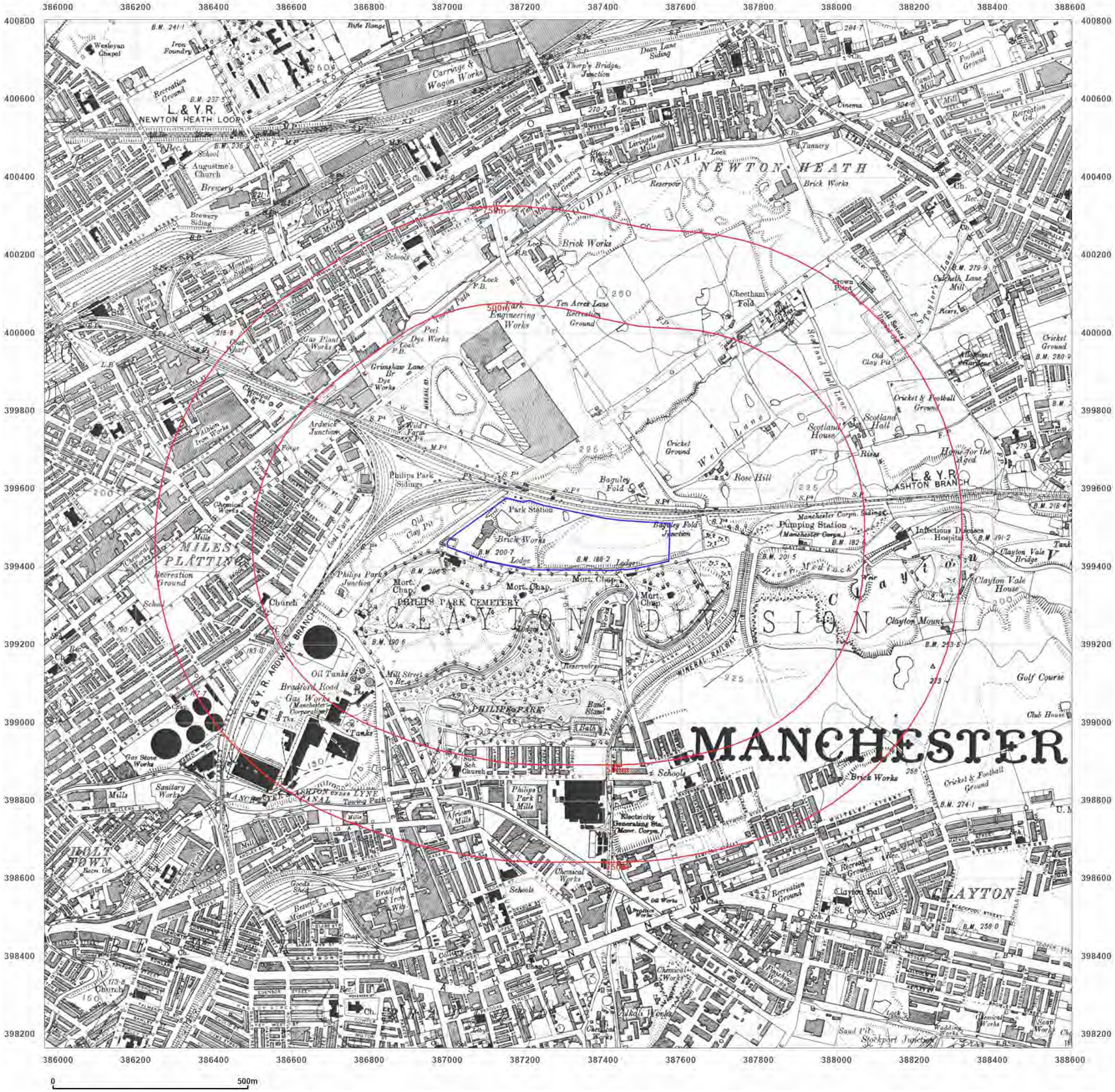
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Client Ref: 007231
Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: County Series

Map date: **1923**

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Printed at: 1:10,560

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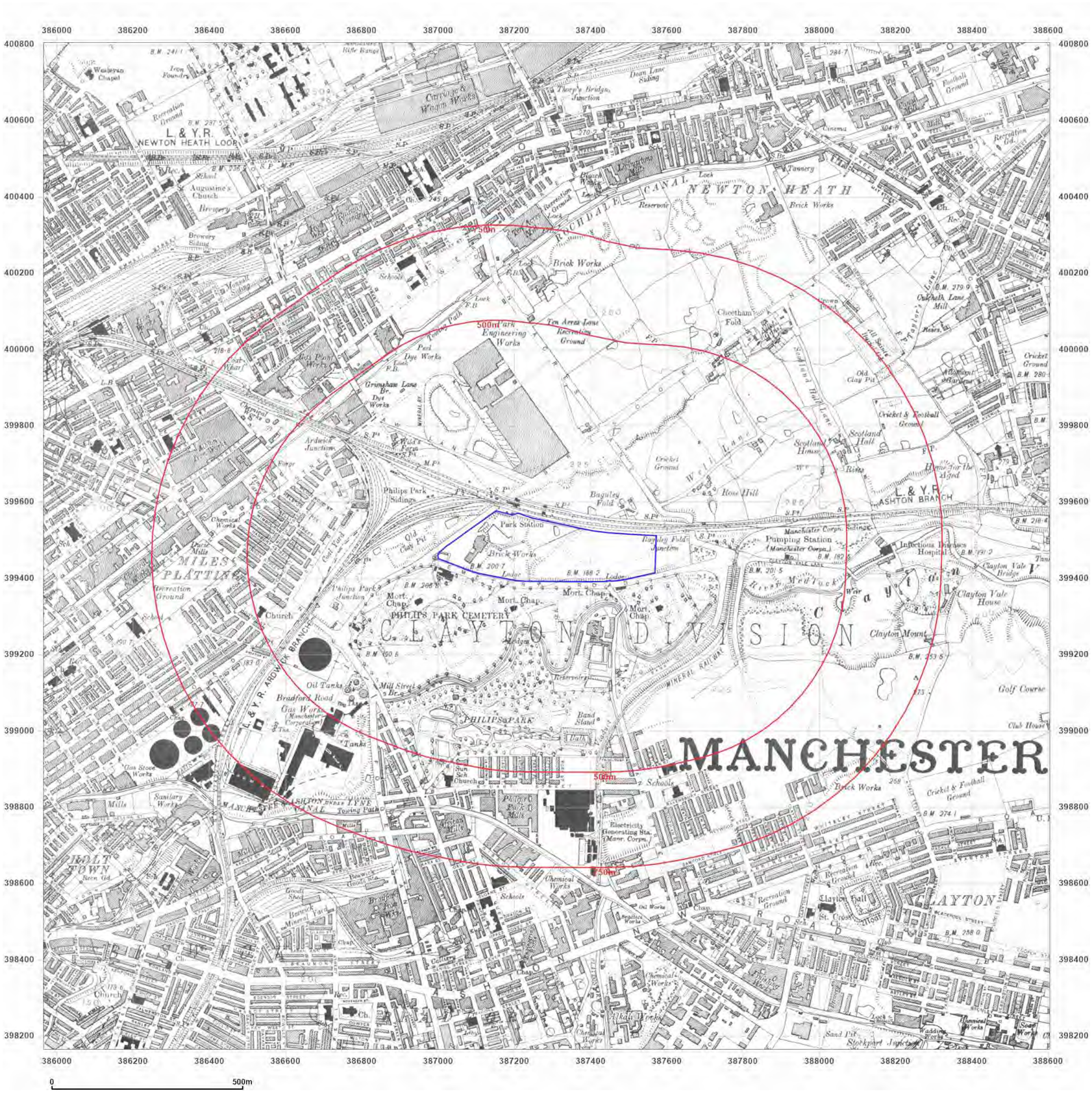
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Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: County Series

Map date: **1923**

Scale: 1:10,560

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Edition 1923
Copyright N/A
Levelled 1906

Surveyed 1844
Revised 1915
Edition 1923
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Levelled 1915

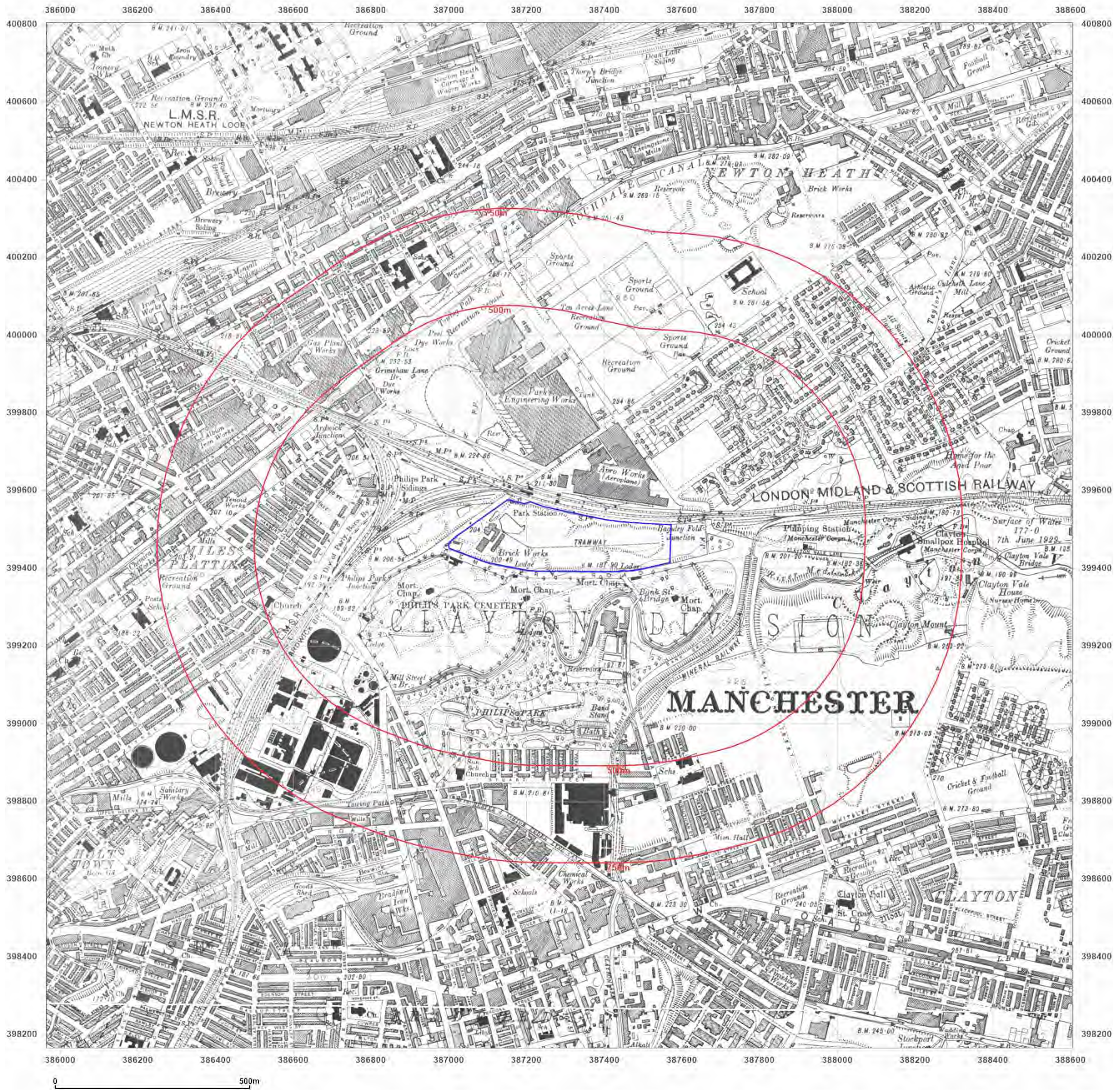
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Grid Ref: 387284, 399484

Map Name: County Series

Map date: **1933-1934**

Scale: 1:10,560

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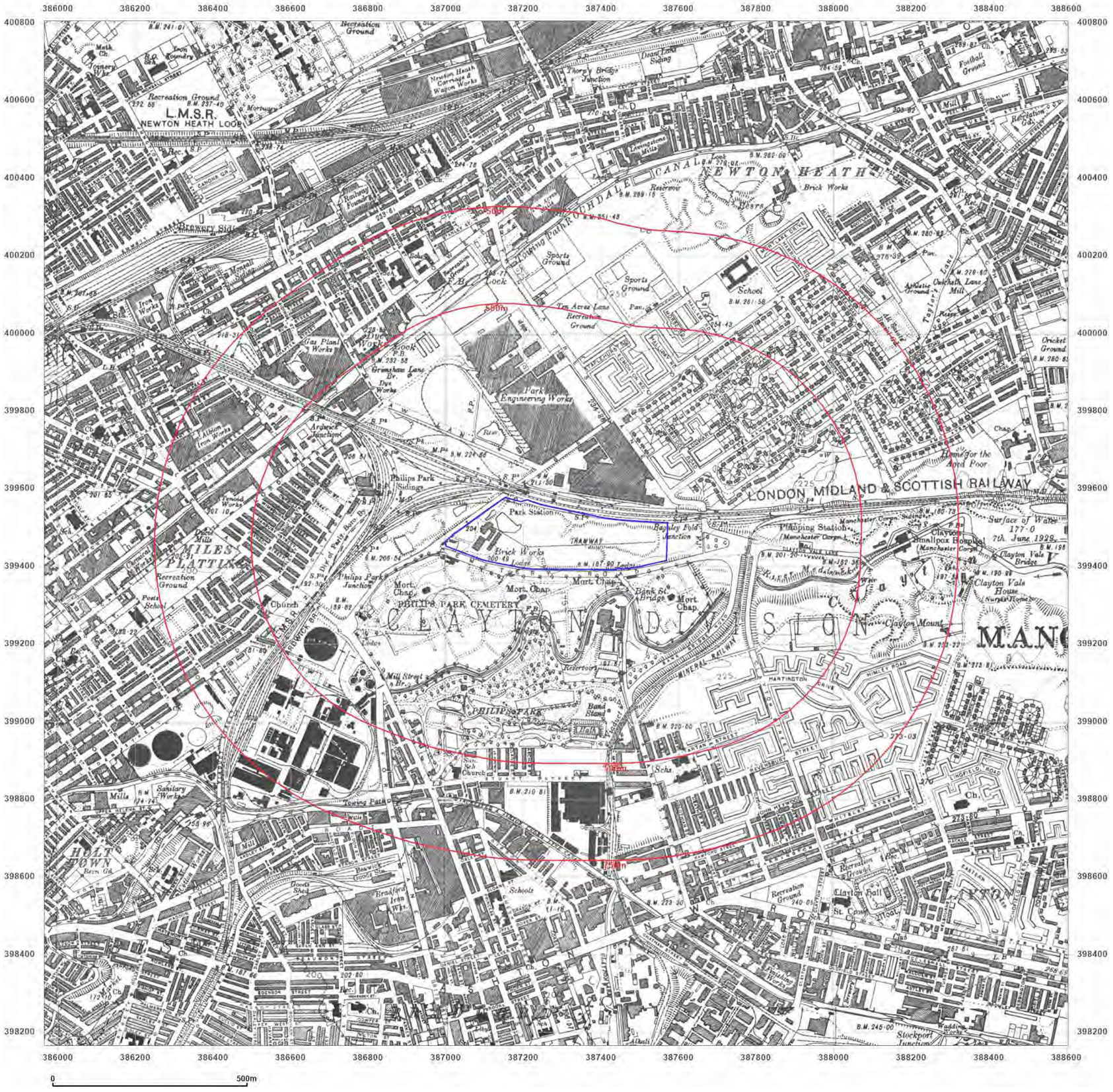
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Map Name: County Series

Map date: **1938**

Scale: 1:10,560

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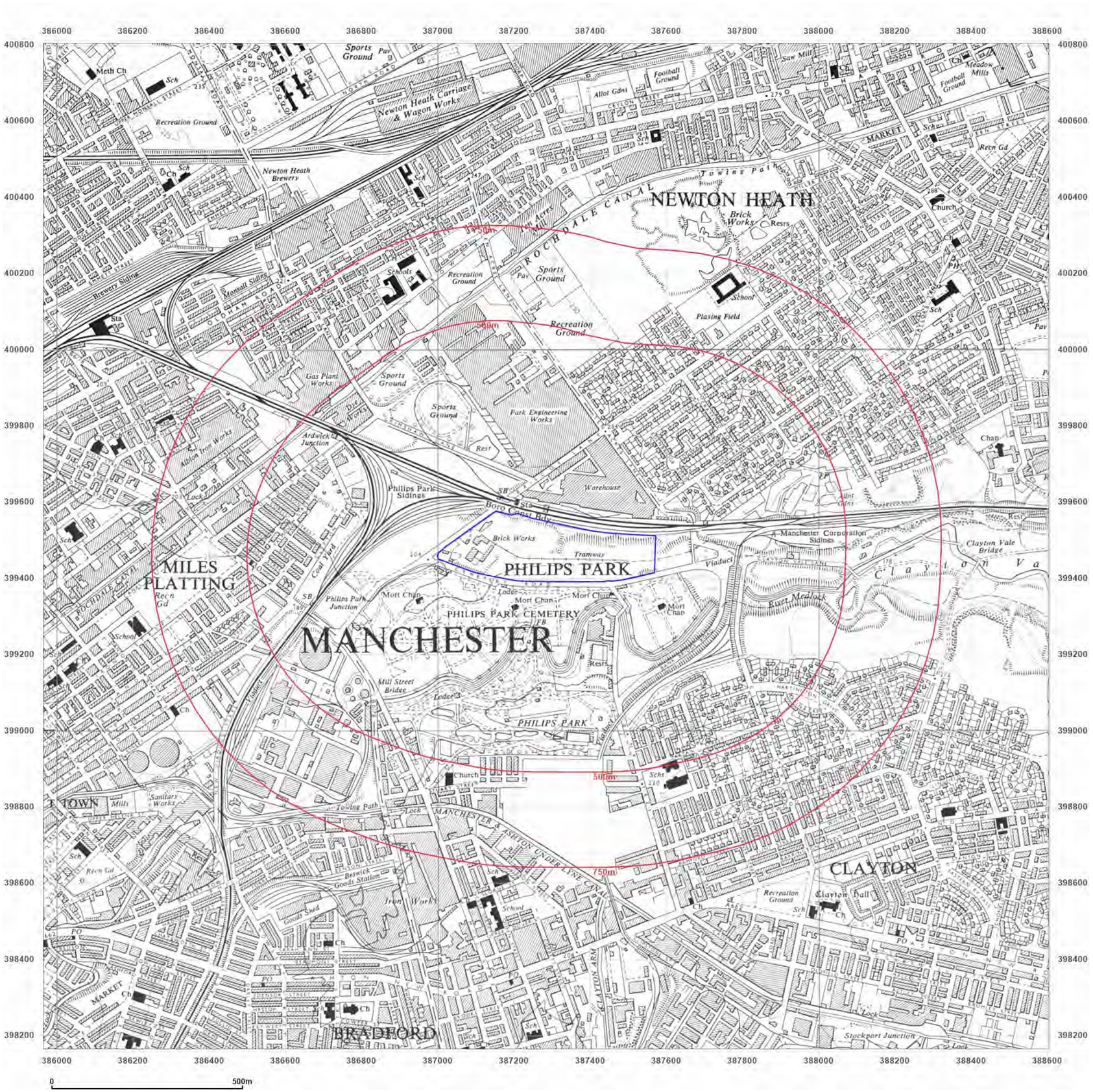
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Client Ref: 007231
Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: Provisional

Map date: **1956**

Scale: 1:10,560

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Edition N/A
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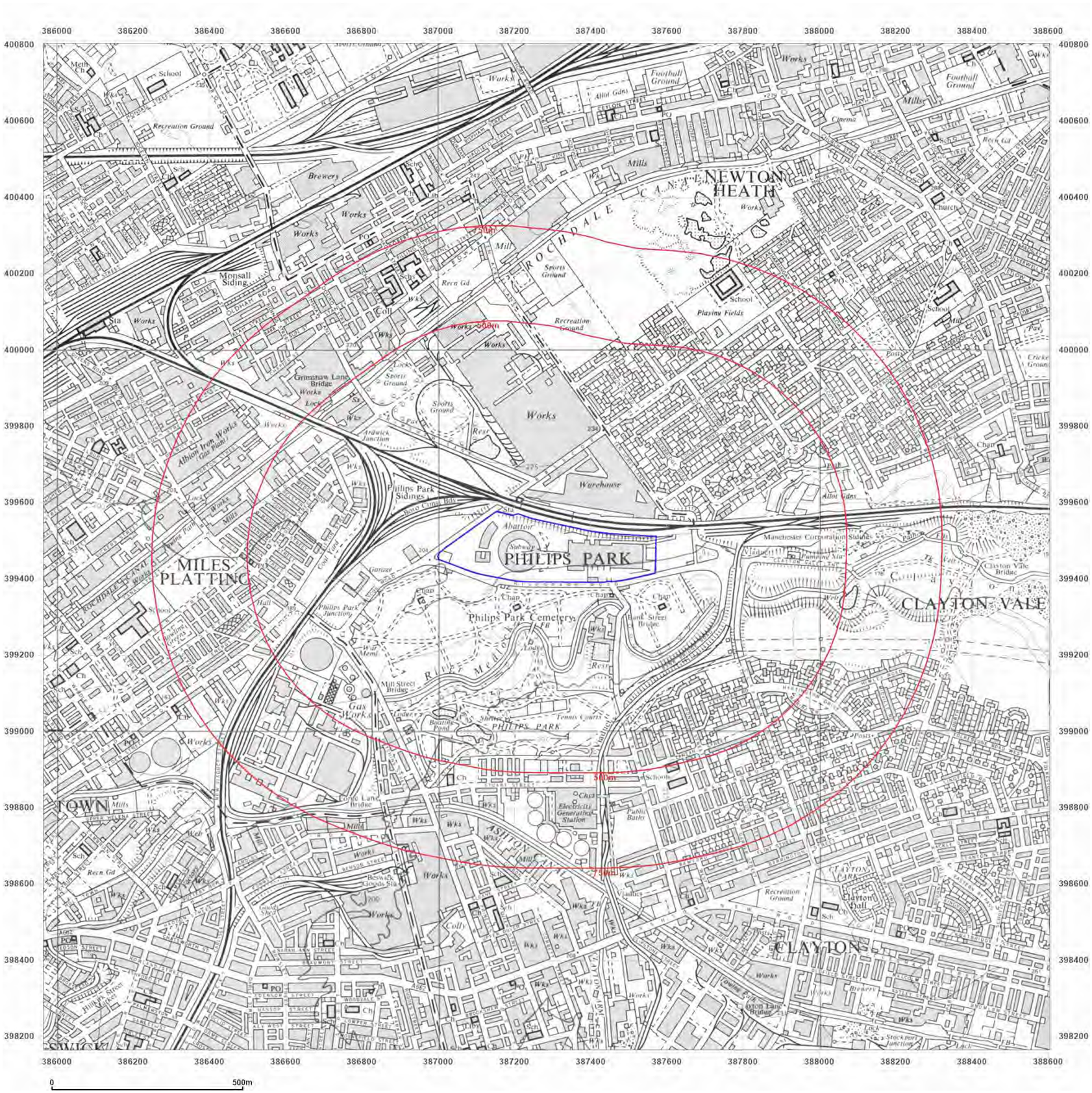
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Grid Ref: 387284, 399484

Map Name: Provisional

Map date: **1966-1968**

Scale: 1:10,560

Printed at: 1:10,560

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Edition N/A
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Surveyed 1968
Revised 1968
Edition N/A
Copyright 1968
Levelled N/A

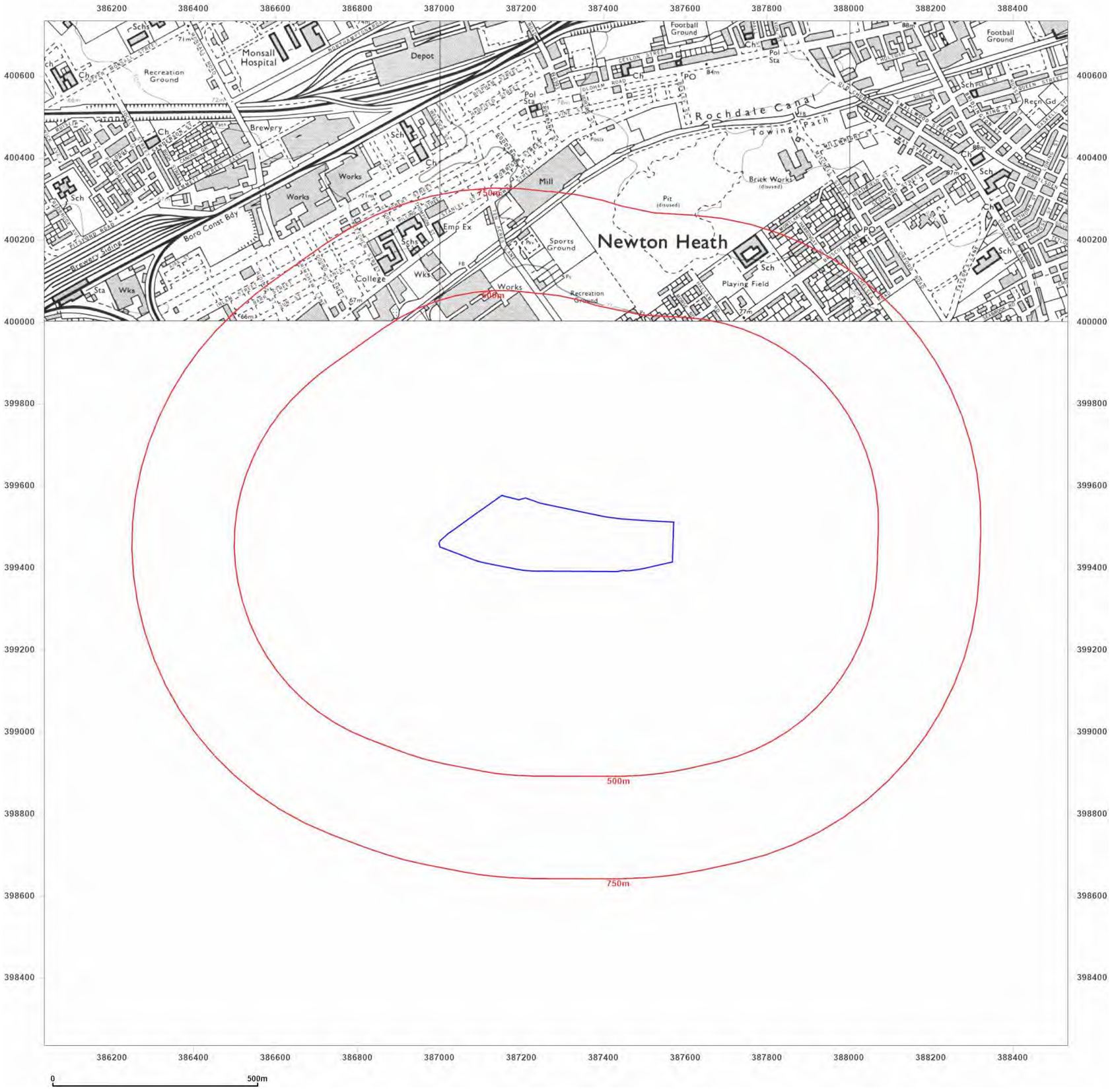
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Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: National Grid

Map date: **1975**

Scale: 1:10,000

Printed at: 1:10,000

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Revised 1975
Edition N/A
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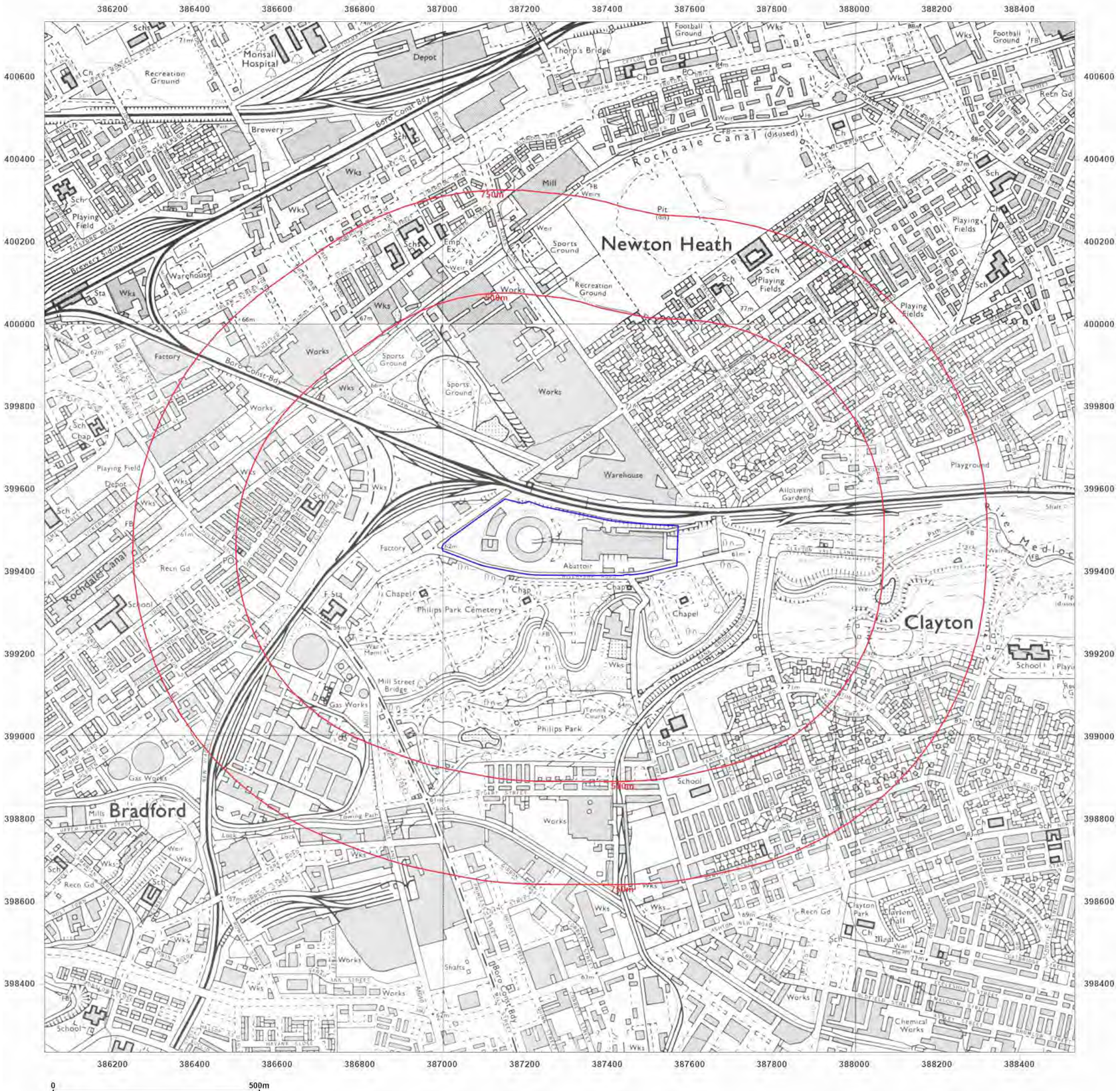
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Grid Ref: 387284, 399484

Map Name: National Grid

Map date: **1980-1981**

Scale: 1:10,000

Printed at: 1:10,000

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Revised 1980
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1976
Revised 1980
Edition N/A
Copyright 1981
Levelled 1976

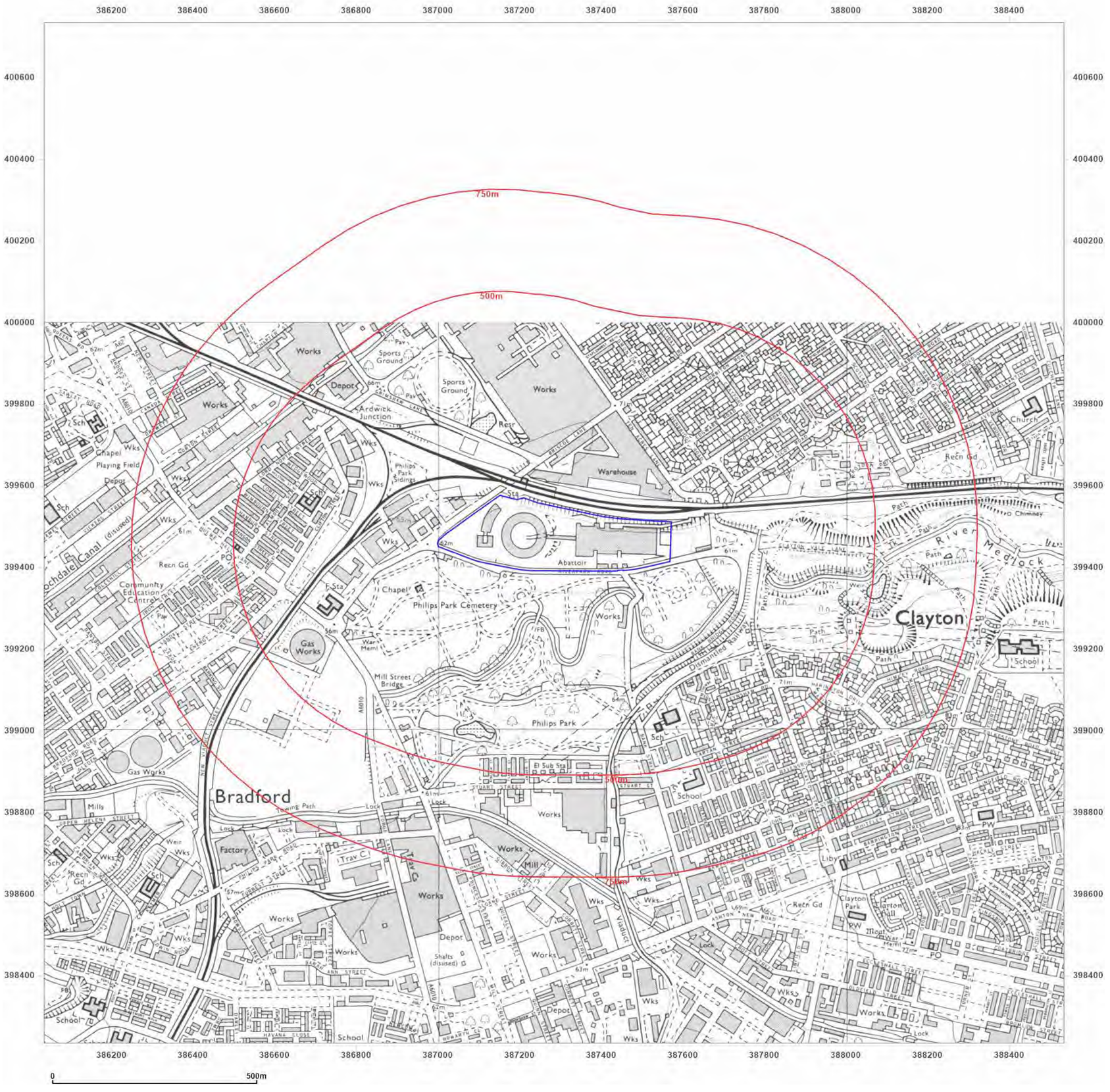
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Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: National Grid

Map date: **1985**

Scale: 1:10,000

Printed at: 1:10,000

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Revised 1985
Edition N/A
Copyright 1985
Levelled 1981

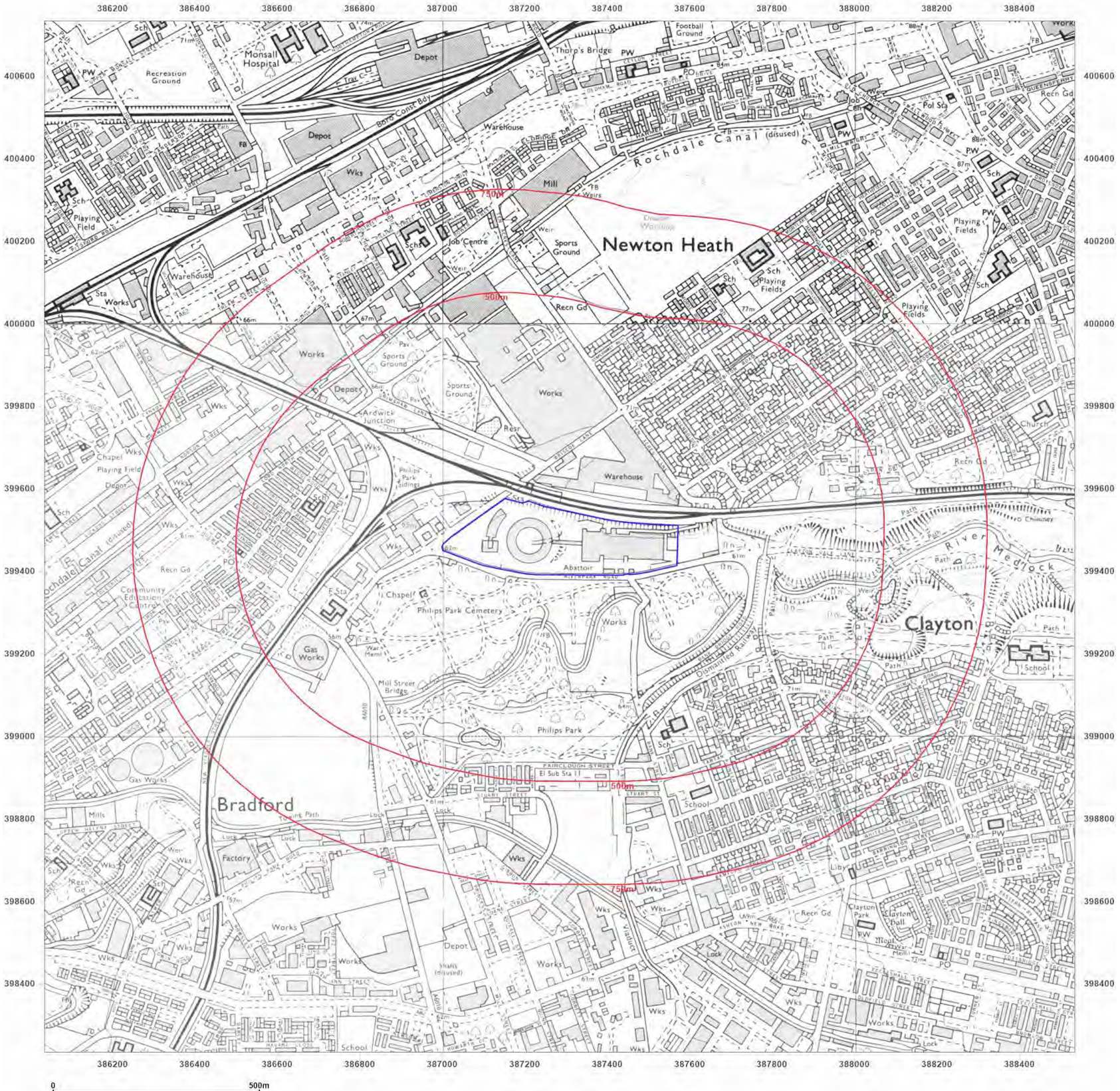
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Site Details:

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MANCHESTER, M40 2XP

Client Ref: 007231
Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: National Grid

Map date: **1988-1991**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1987
Revised 1988
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1985
Revised 1991
Edition N/A
Copyright 1991
Levelled 1981

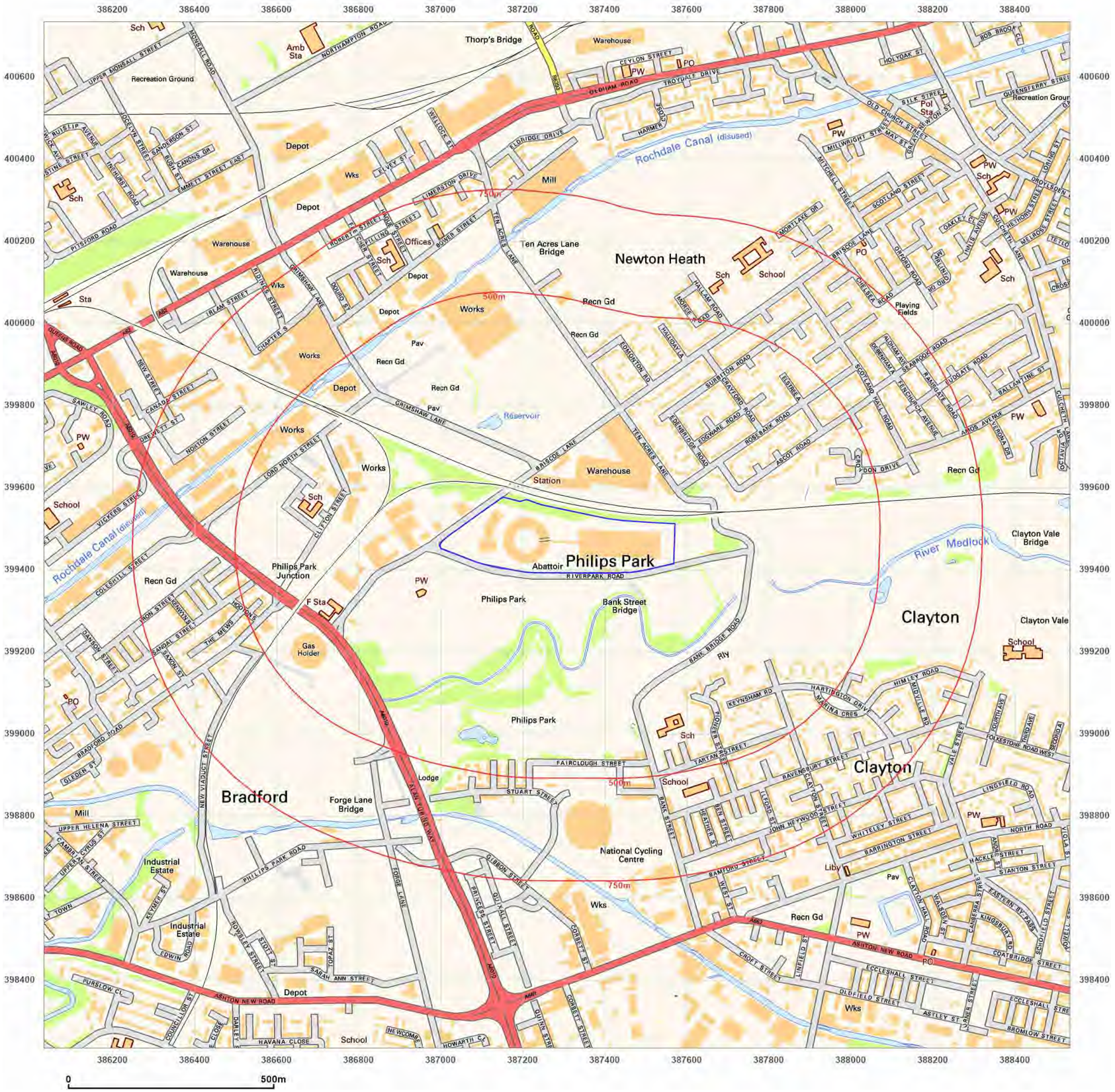
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Groundsure INSIGHTS

Site Details:

RIVERPARK ROAD,
MANCHESTER, M40 2XP

Client Ref: 007231
Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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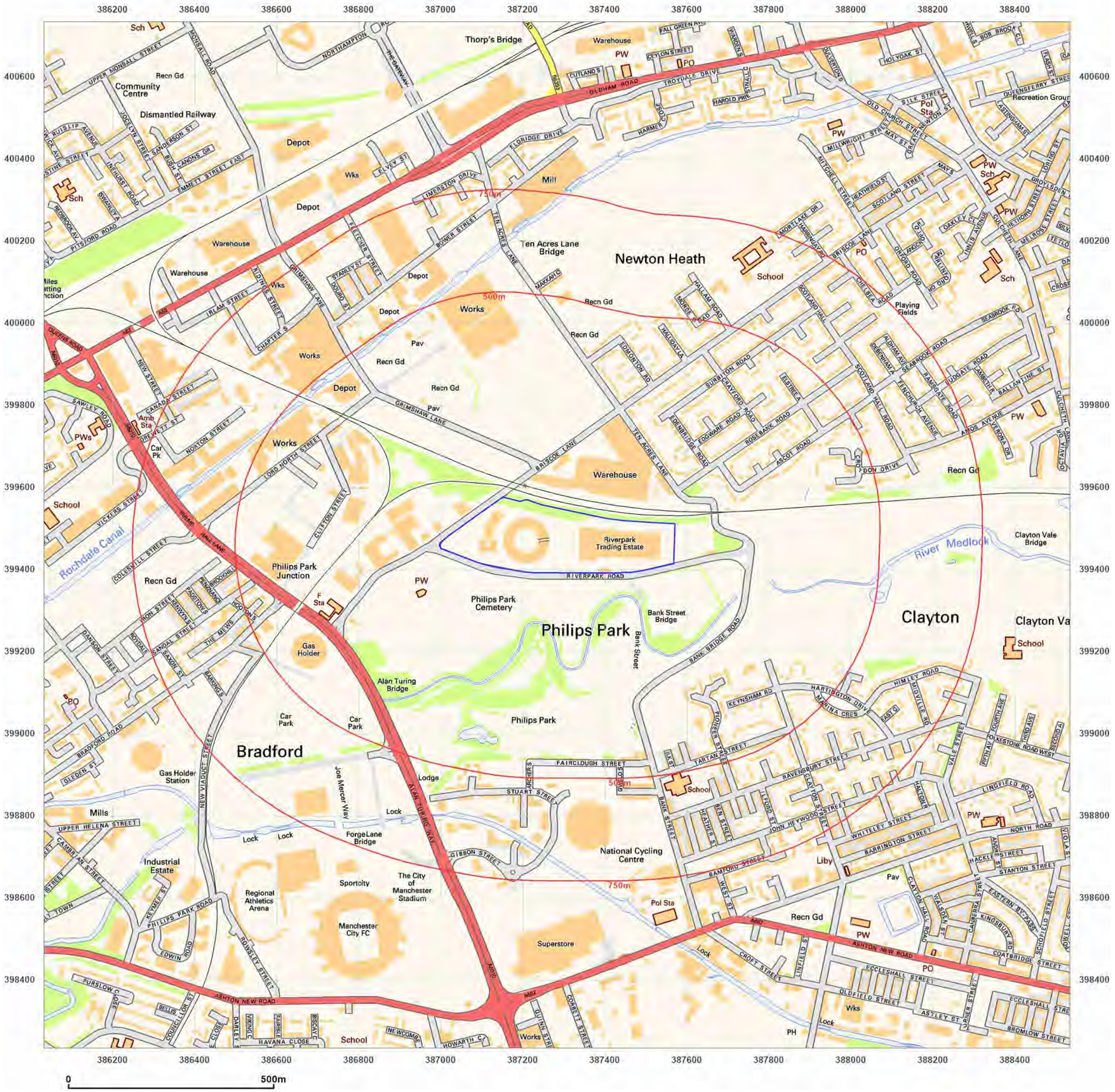
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Groundsure INSIGHTS

Site Details:

RIVERPARK ROAD,
MANCHESTER, M40 2XP

Client Ref: 007231
Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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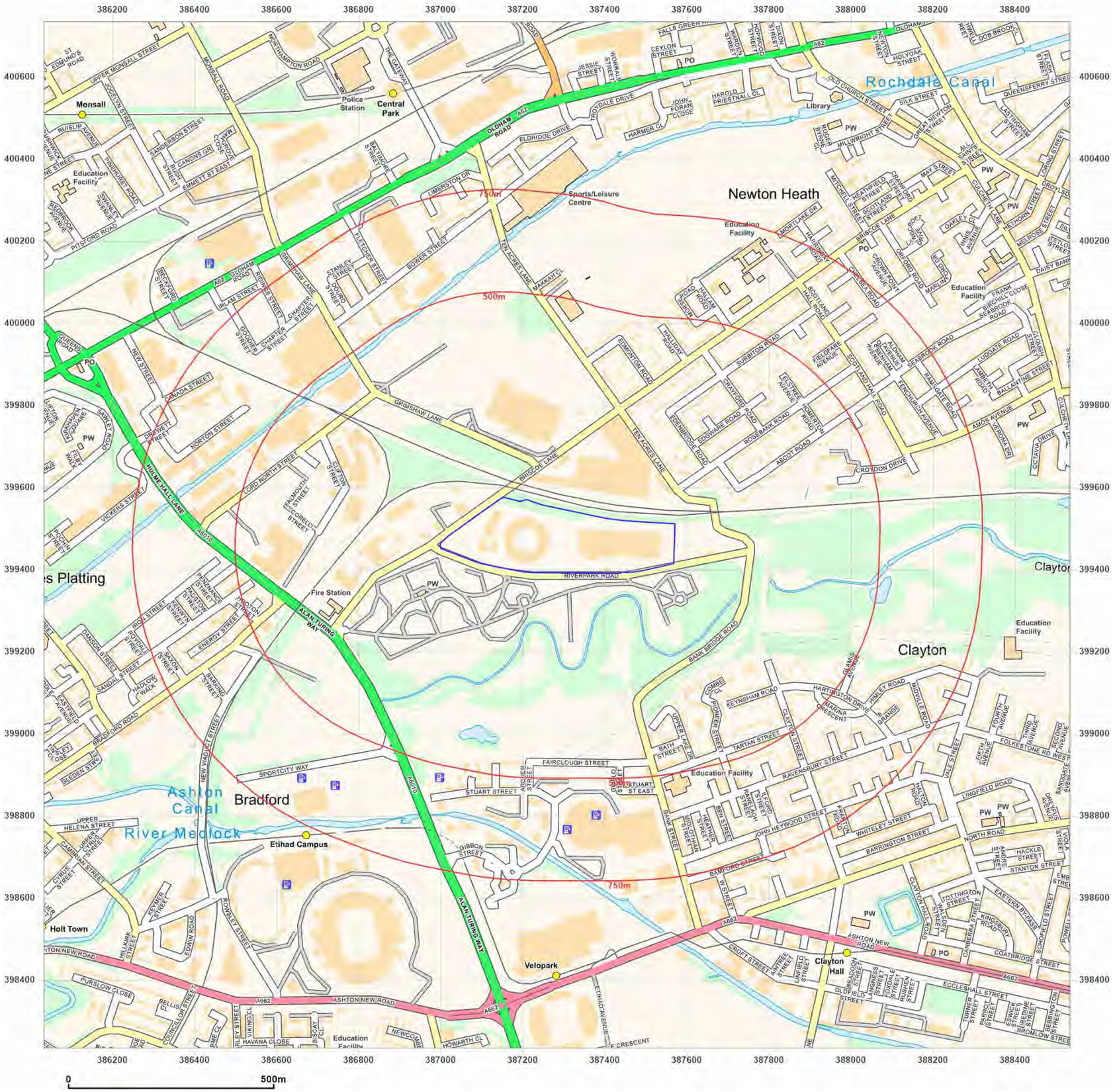
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Groundsure INSIGHTS

Site Details:

RIVERPARK ROAD,
MANCHESTER, M40 2XP

Client Ref: 007231
Report Ref: GS-X1C-1I4-525-TLT
Grid Ref: 387284, 399484

Map Name: National Grid

Map date: **2024**

Scale: 1:10,000

Printed at: 1:10,000

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2024

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APPENDIX VII
EXPLORATORY HOLE LOGS

Borehole Log

Borehole No. **CP101**

Sheet 1 of 2

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387048E - 399468N	Hole Type CP
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 18/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.40			MADE GROUND: Light grey sandy gravel (MOT). Gravel is fine to coarse angular to sub-angular of mudstone.
		1.00	SPT	N=7 (1,2/1,2,2,2)	0.90			MADE GROUND: Red sandy gravel (MOT). Gravel is fine to coarse angular to sub-angular of mudstone and brick.
		2.00	SPT	N=2 (1,0/1,1,0,0)				MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-rounded of brick and ash.
		4.00	SPT	N=4 (1,0/1,1,1,1)				
		5.00	SPT	N=9 (1,1/1,2,3,3)	5.20			Very stiff high strength brown CLAY.
		6.00	SPT	N=24 (3,4/5,6,7,6)				
		9.00	SPT	N=27 (3,5/6,6,7,8)				

1 2 3 4 5 6 7 8 9 10

Remarks

1. Refused on mudstone. 2. Shallow natural deposits have the potential to be reworked.

Borehole Log

Borehole No. **CP101** Sheet 2 of 2

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387048E - 399468N	Hole Type CP
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 18/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	SPT	N=38 (5,7/9,9,10,10)	10.50			Very stiff high strength brown CLAY.
		12.00	SPT	N=36 (4,6/8,9,9,10)				Very stiff high strength brown silty CLAY.
		13.50	SPT	N=36 (5,8/8,9,9,10)				
		15.00	SPT	50 (25 for 145mm/50 for 245mm)	15.00			Dense grey weather MUDSTONE.
		16.50	SPT	50 (25 for 135mm/50 for 275mm)	16.50			End of Borehole at 16.50m

Remarks

1. Refused on mudstone. 2. Shallow natural deposits have the potential to be reworked.

Borehole Log

Borehole No. **CP102/RB103**

Sheet 1 of 4

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387218E - 399462N	Hole Type CP
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15			MADE GROUND: Asphalt.
					0.50			MADE GROUND: Red brown slightly sandy gravel with occasional cobbles. Gravel is fine to coarse angular to sub-angular of brick and sandstone. Cobbles are sub-angular of sandstone.
					0.70			MADE GROUND: Red sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone and brick.
		1.00	SPT	N=45 (5,9/10,10,12,13)	0.80			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-rounded of brick and ash. Hydrocarbon sheen and odour.
		2.00	SPT	N=16 (3,3/3,4,4,5)				Very stiff high strength brown slightly sandy CLAY. Becoming stiff medium strength circa. 2.00m bgl, then becoming very stiff high strength from crica. 3.00m bgl.
		3.00	SPT	N=21 (1,3/5,5,5,6)				
		4.00	SPT	N=24 (3,4/5,6,6,7)				
		5.00	SPT	N=25 (3,3/5,5,7,8)				
		6.00	SPT	N=27 (2,2/4,5,9,9)				
		7.50	SPT	N=33 (3,4/6,8,9,10)				
		9.00	SPT	N=40 (7,9/10,10,10,10)	9.10			Dense grey weather MUDSTONE.

Remarks

1. Cable percussive borehole refused on mudstone at 12.00m bgl, then rotary hole follow on to 40.00m bgl. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **CP102/RB103**

Sheet 2 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387218E - 399462N	Hole Type CP
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	SPT	50 (5,12/50 for 235mm)				Dense grey weather MUDSTONE.
		12.00	SPT	50 (25 for 145mm/50 for 275mm)	12.00			Dense light grey MUDSTONE with SANDSTONE bands.

Remarks

1. Cable percussive borehole refused on mudstone at 12.00m bgl, then rotary hole follow on to 40.00m bgl. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **CP102/RB103**

Sheet 3 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387218E - 399462N	Hole Type CP
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dense light grey MUDSTONE with SANDSTONE bands.

21
22
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Remarks

1. Cable percussive borehole refused on mudstone at 12.00m bgl, then rotary hole follow on to 40.00m bgl. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **CP102/RB103**

Sheet 4 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387218E - 399462N	Hole Type CP
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dense light grey MUDSTONE with SANDSTONE bands.
					40.00			End of Borehole at 40.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Cable percussive borehole refused on mudstone at 12.00m bgl, then rotary hole follow on to 40.00m bgl. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **CP103/RB104**

Sheet 1 of 4

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387292E - 399431N	Hole Type CP
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			MADE GROUND: Asphalt.
					0.10			MADE GROUND: Light grey sandy gravel (MOT). Gravel is fine to coarse angular to sub-angular of mudstone.
					0.60			MADE GROUND: Red brick boulders (building foundation).
		1.00	SPT	N=14 (1,2/2,3,4,5)				Stiff medium strength brown slightly sandy CLAY. Becoming very stiff high strength circa. 2.00m bgl, then becoming very stiff very high strength circa. 4.00m bgl.
		2.00	SPT	N=17 (2,3/4,4,4,5)				
		3.00	SPT	N=27 (1,2/4,5,9,9)				
		4.00	SPT	N=41 (3,5/9,10,11,11)				
		5.00	SPT	N=23 (5,9/5,5,6,7)	5.00			Very stiff high strength brown silty CLAY.
		6.00	SPT	N=34 (3,5/9,9,8,8)				
		7.50	SPT	50 (10,12/50 for 275mm)	7.60			Dense brown medium SAND.
		9.00	SPT	50 (25 for 85mm/50 for 285mm)	9.00			Light grey MUDSTONE with SANDSTONE bands.

Remarks

1. Cable hole refused on sandstone cobble at 9.00m bgl, then Rotary Openhole follow on to 40.00m bgl. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **CP103/RB104**

Sheet 2 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387292E - 399431N	Hole Type CP
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey MUDSTONE with SANDSTONE bands.

11
12
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Remarks

1. Cable hole refused on sandstone cobble at 9.00m bgl, then Rotary Openhole follow on to 40.00m bgl. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **CP103/RB104**

Sheet 3 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387292E - 399431N	Hole Type CP
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey MUDSTONE with SANDSTONE bands.

21
22
23
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Remarks

1. Cable hole refused on sandstone cobble at 9.00m bgl, then Rotary Openhole follow on to 40.00m bgl. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **CP103/RB104**

Sheet 4 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387292E - 399431N	Hole Type CP
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey MUDSTONE with SANDSTONE bands.
					40.00			End of Borehole at 40.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Cable hole refused on sandstone cobble at 9.00m bgl, then Rotary Openhole follow on to 40.00m bgl. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **CP104**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387578E - 399468N	Hole Type CP
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			Black brown slightly sandy CLAY (TOPSOIL) with occasional rootlets. Stiff medium strength brown slightly sandy CLAY.
		1.00	SPT	N=13 (1,2/3,3,3,4)				
		2.00	SPT	N=16 (2,3/4,4,4,4)				
		3.00	SPT	N=26 (5,5/6,6,7,7)	3.00			Very stiff high strength brown silty CLAY. Becoming very stiff very high strength from circa. 4.00m bgl.
		4.00	SPT	N=36 (3,6/7,9,10,10)				
		5.00	SPT	50 (27 for 135mm/50 for 275mm)	5.00			Red brown SANDSTONE.
		6.00	SPT	50 (25 for 135mm/50 for 265mm)	6.00			End of Borehole at 6.00m

Remarks

1. Refused on sandstone.

Borehole Log

Borehole No. **CP105**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387478E - 399409N	Hole Type CP
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 22/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Black brown slightly sandy clay (Reworked topsoil) with occasional rootlets. MADE GROUND: Brown gravelly clay (Reworked). Gravel is fine to coarse angular to sub-rounded of brick and concrete.
		1.00	SPT	N=12 (1,2/3,3,3,3)	1.00			Stiff medium strength brown slightly sandy CLAY. Becoming very stiff high strength circa. 2.00m bgl, then becoming very stiff very high strength circa. 3.00m bgl.
		2.00	SPT	N=21 (3,4/5,5,5,6)				
		3.00	SPT	50 (5,5/50 for 265mm)				
					3.80			Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of mudstone.
		4.00	SPT	50 (7,9/50 for 245mm)	4.20			Dense brown coarse SAND with occasional gravel. Gravel is fine to coarse angular to sub-rounded of sandstone.
		5.00	SPT	50 (8,10/50 for 255mm)				
					5.50			Dense red brown weathered SANDSTONE.
		6.00	SPT	50 (25 for 125mm/50 for 235mm)				
		7.00	SPT	50 (25 for 135mm/50 for 255mm)	7.00			End of Borehole at 7.00m

Remarks

1. Refused on sandstone.

Borehole Log

Borehole No. **RB101**

Sheet 1 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387078E - 399483N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	19/11/2019	Logged By M Williams

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.60			MADE GROUND.
								Firm brown CLAY.

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB101**

Sheet 2 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387078E - 399483N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	19/11/2019	Logged By M Williams

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Firm brown CLAY.
					14.00			Light grey dark grey MUDSTONE with SANDSTONE bands.

11 12 13 14 15 16 17 18 19 20

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB101**

Sheet 3 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords: 387078E - 399483N	Hole Type BH
Location:	Manchester		Level:	Scale 1:50
Client:	Countryside Properties		Dates: 19/11/2019	Logged By M Williams

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey dark grey MUDSTONE with SANDSTONE bands.

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Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB101**

Sheet 4 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387078E - 399483N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	19/11/2019	Logged By M Williams

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey dark grey MUDSTONE with SANDSTONE bands.
					40.00			End of Borehole at 40.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB102**

Sheet 1 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387155E - 399550N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	20/11/2019	Logged By M Williams

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50			MADE GROUND.
								Firm silty CLAY.

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB102**

Sheet 2 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387155E - 399550N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	20/11/2019	Logged By M Williams

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Firm silty CLAY.
					12.70			COAL (intact).
					13.00			Light grey MUDSTONE with SANDSTONE bands.

11 12 13 14 15 16 17 18 19 20

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB102**

Sheet 3 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387155E - 399550N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	20/11/2019	Logged By M Williams

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey MUDSTONE with SANDSTONE bands.

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Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB102**

Sheet 4 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387155E - 399550N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	20/11/2019	Logged By M Williams

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey MUDSTONE with SANDSTONE bands.
					40.00			End of Borehole at 40.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB105**

Sheet 1 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387255E - 399526N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	20/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40			MADE GROUND: Asphalt, MOT, stone and brick.
								Light brown boulder CLAY.

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB105**

Sheet 2 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387255E - 399526N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	20/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown boulder CLAY.
					10.50			Light grey and light brown MUDSTONE with light grey SANDSTONE bands.

11 12 13 14 15 16 17 18 19 20

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB105** Sheet 3 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords: 387255E - 399526N	Hole Type BH
Location:	Manchester		Level:	Scale 1:50
Client:	Countryside Properties		Dates: 20/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey and light brown MUDSTONE with light grey SANDSTONE bands.

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Remarks
1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB105**

Sheet 4 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords: 387255E - 399526N	Hole Type BH
Location:	Manchester		Level:	Scale 1:50
Client:	Countryside Properties		Dates: 20/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey and light brown MUDSTONE with light grey SANDSTONE bands.
					40.00			End of Borehole at 40.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB106**

Sheet 1 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387202E - 399537N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	21/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			MADE GROUND: Asphalt, MOT, stone and brick.
								Light brown boulder CLAY.

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB106**

Sheet 2 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387202E - 399537N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	21/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown boulder CLAY.
					11.70			Dark grey shaley MUDSTONE with light brown SANDSTONE bands and COAL traces.

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Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB106**

Sheet 3 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords: 387202E - 399537N	Hole Type BH
Location:	Manchester		Level:	Scale 1:50
Client:	Countryside Properties		Dates: 21/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					20.20			Dark grey shaley MUDSTONE with light brown SANDSTONE bands and COAL traces. Light grey and dark grey MUDSTONE.
					27.80			Light grey and light brown MUDSTONE.

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB106**

Sheet 4 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387202E - 399537N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	21/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey and light brown MUDSTONE.
					40.00			End of Borehole at 40.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB107**

Sheet 1 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords: 387145E - 399495N	Hole Type BH
Location:	Manchester		Level:	Scale 1:50
Client:	Countryside Properties		Dates: 22/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND: Asphalt, MOT, stone and brick.
					0.80			Light brown boulder CLAY.

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB107**

Sheet 2 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387145E - 399495N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light brown boulder CLAY.
					12.10			Light grey MUDSTONE with dark grey and light brown bands.

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB107**

Sheet 3 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords: 387145E - 399495N	Hole Type BH
Location:	Manchester		Level:	Scale 1:50
Client:	Countryside Properties		Dates: 22/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey MUDSTONE with dark grey and light brown bands.

21
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Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB107**

Sheet 4 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387145E - 399495N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey MUDSTONE with dark grey and light brown bands.
					40.00			End of Borehole at 40.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB108**

Sheet 1 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387275E - 399433N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND: Grass, topsoil and brick.
					0.50			Light brown boulder CLAY.
					8.90			Light grey and light brown MUDSTONE with dark grey MUDSTONE and dark grey SANDSTONE bands.

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB108**

Sheet 2 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords: 387275E - 399433N	Hole Type BH
Location:	Manchester		Level:	Scale 1:50
Client:	Countryside Properties		Dates: 22/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Light grey and light brown MUDSTONE with dark grey MUDSTONE and dark grey SANDSTONE bands.	11 12 13 14 15 16 17 18 19 20

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB108**

Sheet 3 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords: 387275E - 399433N	Hole Type BH
Location:	Manchester		Level:	Scale 1:50
Client:	Countryside Properties		Dates: 22/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey and light brown MUDSTONE with dark grey MUDSTONE and dark grey SANDSTONE bands.

21
22
23
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Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Borehole Log

Borehole No. **RB108**

Sheet 4 of 4

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387275E - 399433N	Hole Type BH
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	22/11/2019	Logged By D Taylor

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey and light brown MUDSTONE with dark grey MUDSTONE and dark grey SANDSTONE bands.
					40.00			End of Borehole at 40.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Complete. 2. Rotary boreholes logged by drillers.

Trial Pit Log

TrialPit No: TP101
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387083.00 - 399463.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): 1.80 x 1.00 Depth 2.20	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Asphalt.
				0.30			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
▼ 0.70	0.60	ES					MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
				0.80			
	1.00	D					Red brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-angular of mudstone and coal traces. Very friable.
				2.20			End of Pit at 2.20m

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4

Trial Pit Photographs



Trial Pit 101



Trial Pit 101 Spoil

Remarks: 1. Water strike encountered at 0.70m bgl. 2. Complete.

Stability: Stable.

Trial Pit Log

TrialPit No: TP102
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387053.00 - 399447.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): Depth 2.00 (1.70 x 1.00)	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Asphalt.
				0.30			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
	0.50	B					MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
	0.50	ES		0.70			
	1.00	ES					Stiff high strength red brown slightly sandy CLAY. Becoming very stiff very high strength from circa. 1.50m bgl.
	1.00	HVP	134				
	1.50	HVP	164				
				2.00			End of Pit at 2.00m

Trial Pit Photographs



Trial Pit 102



Trial Pit 102 Spoil

Remarks: 1. Complete.

Stability: Stable.

Trial Pit Log

TrialPit No: TP103
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387026.00 - 399471.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): Depth 2.00 — 1.60 × 1.00	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Asphalt.
	0.40	ES		0.30			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
▼ 0.50				0.60			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
	0.90	ES					Firm medium strength red brown slightly sandy CLAY.
	1.00	HVP	47				
	1.50	HVP	64				
				2.00			End of Pit at 2.00m

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4

Trial Pit Photographs



Trial Pit 103



Trial Pit 103 Spoil

Remarks: 1. Water strike encountered at 0.50m bgl. 2. Complete.

Stability: Stable.

Trial Pit Log

TrialPit No: TP104
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387080.00 - 399513.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): 1.90 x 1.00 Depth 0.80	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
0.40	0.50	ES		0.10			MADE GROUND: Asphalt.
				0.30			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
				0.80			MADE GROUND: Black sandy gravel with occasional cobbles. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash. Cobbles are angular of brick.
							End of Pit at 0.80m

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Trial Pit Photographs



Trial Pit 104



Trial Pit 104 Spoil

Remarks: 1. Terminated due to filling with water from water strike at 0.40m bgl.

Stability: Stable.

Trial Pit Log

TrialPit No: TP105
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387099.00 - 399526.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): Depth 2.00 (1.00 x 1.60)	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Asphalt.
	0.30	ES					MADE GROUND: Black sandy gravel with occasional cobbles. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash. Cobbles are angular of brick.
▼ 0.60				0.60			
	0.80	HVP	53				Firm medium strength brown slightly gravelly sandy CLAY. Gravel is fine angular to sub-rounded of mudstone and coal traces. Becoming stiff high strength from circa. 1.50m bgl.
	1.00 1.00	B ES					
	1.50	HVP	133				
				2.00			End of Pit at 2.00m

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4

Trial Pit Photographs



Trial Pit 105



Trial Pit 105 Spoil

Remarks: 1. Water strike encountered at 0.60m bgl. 2. Complete.

Stability: Stable.

Trial Pit Log

TrialPit No: TP106
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387170.00 - 399546.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): 1.40 x 1.00 Depth 1.90	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Asphalt.
0.40	0.40	ES		0.50			MADE GROUND: Red brown sandy gravel with occasional cobbles. Gravel is fine to coarse angular to sub-rounded of mudstone, brick and ash. Cobbles are angular of brick.
	0.80	HVP	92				Stiff high strength red brown sandy CLAY with occasional gravel. Gravel is fine to medium angular to sub-angular of coal. Becoming very stiff very high strength from circa. 1.50m bgl.
	1.00 1.00	B ES					
	1.50	HVP	159				
				1.90			End of Pit at 1.90m

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Trial Pit Photographs



Trial Pit 106



Trial Pit 106 Spoil

Remarks: 1. Water strike encountered at 0.40m bgl. 2. Complete.

Stability: Stable.

Trial Pit Log

TrialPit No: TP107
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387250.00 - 399530.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): 1.80 x 1.00 Depth 1.90	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Asphalt.
				0.30			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
▼ 0.70	0.60	ES					MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
				0.80			
	1.00	D					Stiff high strength brown sandy CLAY with occasional gravel. Gravel is fine to medium angular to sub-angular of coal. Very stiff very high strength from circa. 1.50m bgl.
	1.00	HVP	96				
	1.50	HVP	165				
				1.90			End of Pit at 1.90m

Trial Pit Photographs



Trial Pit 107



Trial Pit 107 Spoil

Remarks: 1. Water strike encountered at 0.70m bgl. 2. Complete.

Stability: Stable.

Trial Pit Log

TrialPit No: TP108
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387312.00 - 399510.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): 1.60 x 1.00 Depth 2.20	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Asphalt.
	0.30 0.30	D ES		0.25			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
				0.80			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
	1.20	ES					Brown sandy CLAY with occasional gravel. Gravel is fine to medium angular to sub-angular of coal. Very friable.
				2.20			End of Pit at 2.20m

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Trial Pit Photographs



Trial Pit 108



Trial Pit 108 Spoil

Remarks: 1. Complete.

Stability: Stable.

Trial Pit Log

TrialPit No: TP109
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387319.00 - 399450.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): 1.20 x 1.00 Depth 2.20	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10			MADE GROUND: Asphalt.
				0.30			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
	0.50	HVP	141				Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine to medium sub-angular to sub-rounded of mudstone and sandstone. Very friable. Becoming very stiff very high strength from circa. 1.00m bgl.
	1.00	HVP	177				
	1.30	ES					
				2.00			Brown medium SAND.
				2.20			End of Pit at 2.20m

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Trial Pit Photographs



Trial Pit 109



Trial Pit 109 Spoil

Remarks: 1. Collapsing side walls within sand strata. 2. Complete.

Stability: Unstable.

Trial Pit Log

TrialPit No: TP110
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387307.00 - 399404.00 Level:	Date 05/11/2019
Location: Manchester		Dimensions (m): 1.40 x 1.00 Depth 1.80	Scale 1:30
Client: Countryside Properties			Logged E Fearn

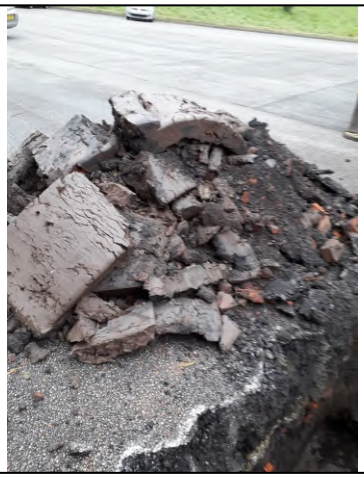
Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Asphalt.
				0.20			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
	0.40	B					
	0.40	ES					MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
				0.60			Stiff high strength brown sandy CLAY with occasional gravel. Gravel is fine to medium angular to sub-angular of coal. Becoming very stiff very high strength from circa. 1.50m bgl.
	1.00	HVP	135				
	1.50	HVP	160				
				1.80			End of Pit at 1.80m

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Trial Pit Photographs



Trial Pit 110



Trial Pit 110 Spoil

Remarks: 1. Complete.

Stability: Stable.

Trial Pit Log

TrialPit No: TP111
Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387270.00 - 399448.00 Level:	Date 06/11/2019
Location: Manchester		Dimensions (m): 1.60 x 1.00 Depth 2.00	Scale 1:30
Client: Countryside Properties			Logged E Fearn

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20			MADE GROUND: Brown slightly sandy clay (Reworked topsoil) with occasional rootlets.
	0.50	HVP	87				MADE GROUND: Brown slightly gravelly sandy clay (Reworked). Gravel is fine to coarse angular to sub-rounded of mudstone, brick and coal traces.
				2.00			End of Pit at 2.00m

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4

Trial Pit Photographs



Trial Pit 111



Trial Pit 111 Spoil

Remarks: 1. Complete.

Stability: Stable.

Borehole Log

Borehole No. **WS101**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387324E - 399435N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 06/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.10			MADE GROUND: Asphalt.
					0.30			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
					0.50			MADE GROUND: Red cobbles. Cobbles are angular of brick.
		1.00 1.00	D SPT	N=27 (1,2/4,5,8,10)				Very stiff high strength brown sandy CLAY with occasional gravel. Gravel is fine to medium angular to sub-angular of coal. Becoming stiff medium strength from circa. 2.00m bgl. Then becoming very stiff high strength from circa. 3.00m bgl. Then becoming very stiff very high strength from circa. 4.00m bgl.
		2.00 2.00	D SPT	N=14 (1,2/2,3,4,5)				
		3.00 3.00	D SPT	N=29 (4,3/4,6,8,11)				
		4.00 4.00	D SPT	N=39 (8,11/7,11,10,11)				
		5.00 5.00	D SPT	50 (12,12/50 for 245mm)				
					5.45			End of Borehole at 5.45m

Remarks

1. Complete. 2.Monitoring well installed.

Borehole Log

Borehole No. **WS102**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387281E - 399407N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 06/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
		0.40	ES		0.30			MADE GROUND: Grey sandy gravel (MOT). Gravel is fine to coarse angular to sub-angular of mudstone and sandstone.
					0.50			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
		0.90	ES					Stiff medium strength brown sandy CLAY with occasional gravel. Gravel is fine to medium angular to sub-angular of coal. Becoming very stiff high strength from circa. 2.00m bgl. The becoming very stiff very high strength from circa. 5.00m bgl.
		1.00	D					
		1.00	SPT	N=13 (1,2/2,3,4,4)				
		2.00	D					
		2.00	SPT	N=27 (4,6/5,7,7,8)				
		3.00	D					
		3.00	SPT	N=33 (5,5/8,7,8,10)				
		4.00	D					
		4.00	SPT	N=30 (5,7/6,7,9,8)				
		5.00	SPT	N=42 (9,10/10,10,11,11)				
					5.45			End of Borehole at 5.45m

Remarks

1. No return from 4.00m to 5.00m bgl. 2. Complete. 3. Monitoring well installed.

Borehole Log

Borehole No. **WS103**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387276E - 399519N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 06/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
		0.30	ES					MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
					0.60			Very stiff high strength red brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular to sub-angular of mudstone and coal traces. Becoming very stiff very high strength from circa. 3.00m bgl.
		1.00 1.00	D SPT	N=24 (4,4/5,6,6,7)				
		1.50	U					
		2.00 2.00	D SPT	N=22 (2,3/3,6,6,7)				
		3.00 3.00	D SPT	N=44 (6,7/7,11,12,14)				
		4.00	SPT	50 (10,11/50 for 260mm)				
					4.45			End of Borehole at 4.45m

Remarks

1. No return from 3.00m to 4.00m bgl. 2. Refused in very stiff CLAY.

Borehole Log

Borehole No. **WS104**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387354E - 399513N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	06/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Concrete.
					0.50			MADE GROUND: Red cobbles. Cobbles are angular of brick.
								End of Borehole at 0.50m

Remarks

1. Terminated due to barrel, SPT and CPT unable to penetrate ground.

Borehole Log

Borehole No. **WS105**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387276E - 399514N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 06/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.20			MADE GROUND: Brown slightly sandy clay (Topsoil) with occasional rootlets.
		1.00 1.00	D SPT	N=18 (2,3/3,4,5,6)				MADE GROUND: Red brown gravelly clay (Reworked). Gravel is fine to coarse angular to sub-rounded of mudstone and brick.
					2.45			End of Borehole at 2.45m

Remarks

1. Terminated due to borehole falling in twice.

Borehole Log

Borehole No. **WS106**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords: 387294E - 399464N	Hole Type WS
Location:	Manchester		Level:	Scale 1:50
Client:	Countryside Properties		Dates: 06/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.40	U		0.20			MADE GROUND: Brown sandy clay (Reworked topsoil) with occasional rootlets. Very stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular to sub-rounded of mudstone and coal traces.
		1.00 1.00	D SPT	N=17 (2,2/5,4,3,5)				
		2.00 2.00	D SPT	N=28 (4,5/6,6,8,8)				
		3.00 3.00	D SPT	50 (5,10/50 for 295mm)	3.45			End of Borehole at 3.45m

Remarks

1. Terminated due to collapsed borehole. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS107**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387185E - 399537N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 06/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.30			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
		0.70	ES					MADE GROUND: Red black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
		1.00	D					
		1.00	SPT	N=4 (1,0/0,1,1,2)				
		2.00	SPT	N=25 (5,5/6,5,7,7)				
					2.45			End of Borehole at 2.45m

Remarks

1. No return from 2.00m 2. Terminated due to brick obstruction. 3. Monitoring well installed.

Borehole Log

Borehole No. **WS108**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387266E - 399501N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 06/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
		0.40	ES					MADE GROUND: Red sandy gravel. Gravel is coarse angular to sub-angular of brick and ash.
		1.00 1.00	D SPT	N=18 (2,2/3,5,5,5)	1.20			Very stiff high strength brown sandy CLAY with occasional gravel. Gravel is fine to medium angular to sub-angular of coal. Becoming very stiff very high strength from circa. 3.00m bgl.
		2.00 2.00	D SPT	N=22 (4,3/5,5,6,6)				
		3.00 3.00	D SPT	50 (10,10/50 for 290mm)				
					3.80			End of Borehole at 3.80m

Remarks

1. Refused in very stiff CLAY. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS109**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387011E - 399458N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 07/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.30			MADE GROUND: Red sandy gravel. Gravel is coarse angular to sub-angular of mudstone and brick.
		0.50	ES					MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of brick and coal traces.
		1.00 1.00	D SPT	N=4 (1,1/1,1,1,1)	1.10			Stiff medium strength grey brown sandy gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of mudstone. Becomes very stiff high strength from 3.00 mbgl.
		2.00 2.00	D SPT	N=10 (1,2/3,2,2,3)				
		3.00 3.00	D SPT	N=26 (5,6/6,6,7,7)				
		4.00 4.00	D SPT	N=37 (7,7/8,10,9,10)				
		5.00 5.00	D SPT	N=45 (9,10/10,10,12,13)				
					5.45			End of Borehole at 5.45m

1 2 3 4 5 6 7 8 9 10

Remarks

1. Complete. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS110**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387141E - 399496N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	06/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.30			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-rounded of brick and ash.
								End of Borehole at 0.30m

Remarks

1. Terminated due to barrel, SPT and CPT unable to penetrate ground.

Borehole Log

Borehole No. **WS111**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387114E - 399533N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 07/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
		0.30	ES					MADE GROUND: Red sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone and brick.
					0.80			
		0.90	ES					Very stiff high strength grey brown sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of mudstone and coal traces.
		1.00	D					
		1.00	SPT	N=18 (2,3/4,4,5,5)				
		2.00	D					
		2.00	SPT	N=21 (4,4/4,5,6,6)				
		3.00	D					
		3.00	SPT	50 (7,11/50 for 260mm)				
					3.45			End of Borehole at 3.45m

Remarks

1. Terminated due to collapsed borehole. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS112**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387032E - 399456N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	07/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
		0.60	ES		0.50			MADE GROUND: Red sandy gravel. Gravel is fine to coarse angular to sub-angular of brick.
		1.00	D		1.00			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-rounded of brick and ash.
		1.00	U					
		1.00	SPT	N=4 (1,1/1,1,1,1)				MADE GROUND: Brown slightly gravelly sandy clay (Reworked). Gravel is fine to coarse angular to sub-rounded of mudstone, sandstone and brick.
	2.10	2.00	D					
		2.00	SPT	N=2 (1,0/1,0,0,1)				
		2.10	ES					
		3.00	D					
		3.00	SPT	N=2 (1,0/1,0,0,1)				
		4.00	D					
		4.00	SPT	N=4 (6,2/1,1,1,1)				
		5.00	SPT	N=0 (1,0/0,0,0,0)				
					5.45			End of Borehole at 5.45m

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Remarks

1. Water strike encountered at 2.10m bgl 2. Complete. 3. Monitoring well installed.

Borehole Log

Borehole No. **WS113**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387096E - 399428N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	07/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.20			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
					0.50			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-rounded of mudstone, brick and coal traces.
								End of Borehole at 0.50m

Remarks

1. Terminated in service inspection pit - unable to continue digging through concrete/brick layer.

Borehole Log

Borehole No. **WS114**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387095E - 399504N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 07/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.30			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
		0.50	ES		0.60			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-rounded of mudstone, brick and ash.
		1.00	D					Very stiff high strength grey brown sandy CLAY with occasional gravel. Gravel is fine to medium angular of coal. Becoming very stiff very high strength from circa. 3.00m bgl.
		1.00	SPT	N=16 (3,4/2,4,5,5)				
		1.50	U					
		2.00	D					
		2.00	SPT	N=17 (4,4/3,4,5,5)				
		3.00	D					
		3.00	SPT	50 (7,8/50 for 295mm)				
					3.45			End of Borehole at 3.45m

Remarks

1. Refused due to made ground falling in. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS115**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387192E - 399406N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	07/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.30			MADE GROUND: Red sandy gravel. Gravel is fine to coarse angular to sub-rounded of brick.
					0.60			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
								End of Borehole at 0.60m

Remarks

1. Terminated in service inspection pit - unable to continue digging through concrete/brick layer.

Borehole Log

Borehole No. **WS116**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387155E - 399437N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	07/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			MADE GROUND: Asphalt.
					0.60			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-rounded of mudstone, brick and ash.
								End of Borehole at 0.60m

Remarks

1. Terminated in service inspection pit - unable to continue digging through concrete/brick layer.

Borehole Log

Borehole No. **WS117**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387410E - 399416N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 08/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.40			MADE GROUND: Red sandy gravel. Gravel is fine to coarse angular to sub-angular of brick.
		0.80	ES					MADE GROUND: Black slightly clayey sandy gravel. Gravel is fine to coarse angular to sub-rounded of mudstone, sandstone, brick and ash.
		1.00	SPT	N=13 (1,2/1,0,0,12)				
		2.00	D					
		2.00	SPT	N=24 (2,3/4,5,6,9)				
		2.50	U					
		3.00	D		2.90			Very stiff very high strength brown sandy gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of mudstone.
		3.00	SPT	50 (5,6/50 for 265mm)				
					3.45			End of Borehole at 3.45m

Remarks

1. Terminated due to collapsed borehole. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS118**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387267E - 399441N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 07/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
		0.30	ES		0.30			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
					0.80			MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-rounded of mudstone, brick and ash.
		0.90	ES					Firm low strength brown sandy gravelly CLAY. Gravel is fine to coarse angular to sub-angular of mudstone. Becoming very stiff very high strength from circa. 2.00m bgl.
		1.00	D					
		1.00	SPT	N=4 (1,0/1,1,1,1)				
		2.00	D					
		2.00	SPT	N=38 (4,5/7,9,11,11)				
		3.00	D					
		3.00	SPT	50 (7,9/50 for 255mm)				
					3.45			End of Borehole at 3.45m

Remarks

1. Terminated due to made ground falling in. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS119**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387503E - 399404N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	08/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.10			MADE GROUND: Black brown sandy clay (Topsoil) with occasional rootlets. MADE GROUND: Red sandy gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick and ash.
		1.00	D					
		1.00	SPT	N=14 (3,5/3,3,3,5)	1.10			Very stiff high strength brown sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of mudstone.
		2.00	SPT	N=19 (3,4/4,4,5,6)				
					2.45			End of Borehole at 2.45m

Remarks

1. Terminated due to made ground falling in. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS120**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387457E - 399404N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	08/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			MADE GROUND: Concrete.
					0.60			MADE GROUND: Red sandy gravel. Gravel is fine to coarse angular to sub-rounded of mudstone, brick and ash.
								End of Borehole at 0.60m

Remarks

1. Terminated due to drain identified in service inspection pit.

Borehole Log

Borehole No. **WS121**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387555E - 399439N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 08/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.20			MADE GROUND: Concrete with rebar.
					0.40			MADE GROUND: Black slightly clayey sandy gravel. Gravel is fine to coarse angular to sub-rounded of mudstone, brick and ash.
		0.90	ES					Very stiff high strength brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of mudstone.
		1.00	D					
		1.00	U					
		1.00	SPT	N=16 (1,2/2,3,4,7)				
		2.00	SPT	N=29 (6,6/8,7,7,7)				
					2.45			End of Borehole at 2.45m

Remarks

1. Terminated due to support foot sheared off while removing SPT rod. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS122**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387526E - 399425N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	08/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.30			MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone.
					0.50			MADE GROUND: Red sandy gravel. Gravel is fine to coarse angular to sub-angular of brick.
		0.70	ES		0.80			MADE GROUND: Black clayey gravel. Gravel is fine to coarse angular to sub-rounded of mudstone and ash.
	1.00	1.00	D					Very stiff high strength brown sandy CLAY with occasional gravel. Gravel is coarse angular to sub-angular of mudstone. Becoming very stiff very high strength from circa. 2.00m bgl.
		1.00	SPT	N=19 (3,3/4,4,5,6)				
		1.20	ES					
		2.00	D					
		2.00	SPT	38 (10,1/38 for 295mm)				
					2.45			End of Borehole at 2.45m

Remarks

1. Water strike encountered at 1.00m bgl. 2. Terminated due to refusal in very stiff clay. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS123**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387584E - 399455N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 08/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.40	ES		0.50			MADE GROUND: Black very sandy gravel with occasional rootlets. Gravel is fine to coarse angular to sub-rounded of mudstone, brick, plastic and ash.
		1.00 1.00 1.20	D SPT ES	N=16 (2,2/4,4,4,4)				Very stiff high strength Brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of mudstone and coal traces.
		2.00 2.00	D SPT	N=32 (5,6/7,7,8,10)				
		2.50	SPT	50 (10,8/50 for 275mm)	2.50			End of Borehole at 2.50m
		3.00	D					

Remarks

1. Terminated due to collapsed borehole. 2. Monitoring well installed.

Borehole Log

Borehole No. **WS124**

Sheet 1 of 1

Project Name:	Riverpark Trading Estate	Project No. 13492	Co-ords:	387559E - 399470N	Hole Type WS
Location:	Manchester		Level:		Scale 1:50
Client:	Countryside Properties		Dates:	08/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
	0.70	1.00 1.00 1.00	D ES SPT	N=50 (6,6/10,12,14,14)	0.20 0.30 0.70 1.45			MADE GROUND: Concrete. MADE GROUND: Light yellow brown slightly sandy gravel (MOT). Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone. MADE GROUND: Black sandy gravel. Gravel is fine to coarse angular to sub-angular of brick and ash. Very stiff very high strength brown sandy CLAY with occasional cobbles. Cobbles are angular to sub-angular of mudstone. End of Borehole at 1.45m

Remarks

1. Water strike encountered at 0.70m bgl. 2. Refused in very stiff CLAY.

Borehole Log

Borehole No. **WS125**

Sheet 1 of 1

Project Name: Riverpark Trading Estate	Project No. 13492	Co-ords: 387586E - 399436N	Hole Type WS
Location: Manchester		Level:	Scale 1:50
Client: Countryside Properties		Dates: 08/11/2019	Logged By E Fearn

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.40			MADE GROUND: Black gravel. Gravel is fine to coarse angular to sub-angular of mudstone, brick, plastic and ash.
		1.00	D					MADE GROUND: Red sandy gravel. Gravel is fine to coarse angular to sub-rounded of brick and ash.
		1.00	SPT	N=10 (1,2/2,3,3,2)	1.20			
		1.50	U					Very stiff high strength brown sandy gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of mudstone.
		2.00	D					
		2.00	SPT	N=22 (3,4/6,5,5,6)				
		3.00	SPT	N=50 (6,8/10,12,14,14)	3.45			End of Borehole at 3.45m

Remarks

1. Terminated due to collapsed borehole. 2. Monitoring well installed.

Trial Pit Log

TrialPit No TP201 / SA203
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387554.00 - 399466.00 Level: 56.50	Date 18/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): Depth 1.50, 0.60 x 2.00	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

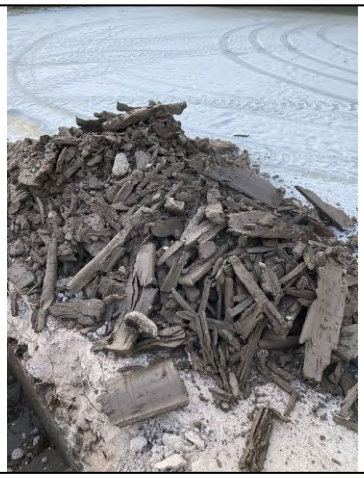
Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	56.30		MADE GROUND: Concrete reinforced with 10mm rebar.
	0.30	ES		0.40	56.10		MADE GROUND: Greyish brown slightly gravelly fine to medium sand. Gravel is fine to medium subangular of sandstone, brick, and concrete.
	0.60	ES					Stiff high strength brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone, and coal.
	0.70	HVP	114				
	1.50	HVP	156	1.50	55.00		End of Pit at 1.50m

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Trial Pit Photographs



TP201 Pit



TP201 Arising

Remarks: 1. Complete. 2. Soakaway conducted. 3. Hard digging from circa 0.75m bgl. 4. Timings- 2 minutes 36 seconds to excavate 0.20m.

Stability: Stable

Trial Pit Log

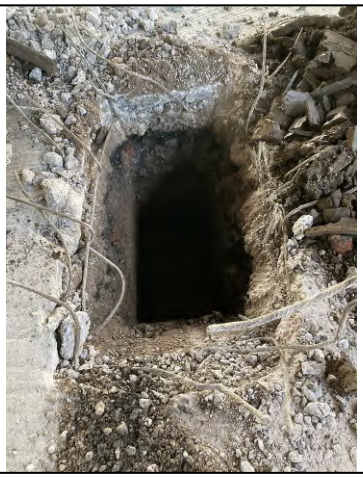
TrialPit No: TP202
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387550.00 - 399444.00 Level:	Date 19/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 × 0.80 Depth 1.85	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25			MADE GROUND: Concrete reinforced with 10mm rebar.
				0.60			MADE GROUND: Dark greyish brown slightly gravelly fine to medium sand. Gravel is fine to medium subangular of sandstone, brick, and concrete.
	1.00	HVP	127				Stiff high strength brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone, and rare coal.
	1.40 1.50	HVP ES	188				
	1.80	HVP	179	1.85			End of Pit at 1.85m

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Trial Pit Photographs



TP202 Pit



TP202 Arising

Remarks: 1. Complete.

Stability: Stable

Trial Pit Log

TrialPit No: TP203
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387493.00 - 399423.00 Level: 56.70	Date 17/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 x 0.80 Depth 0.90	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

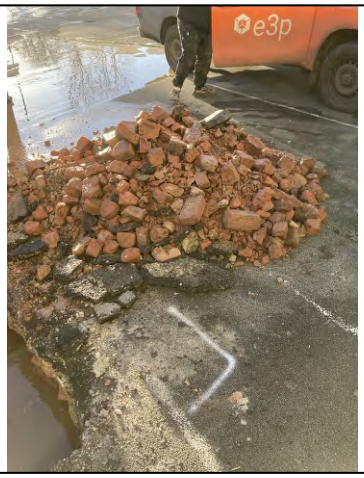
Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.60		MADE GROUND: Asphalt.
				0.15	56.55		MADE GROUND: Light greyish brown sandy gravel. Gravel is fine to medium subangular of sandstone. (MOT subbase).
	0.40 0.50	B ES					MADE GROUND: Reddish brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Frequent cobbles of subangular brick and sandstone.
▼ 0.60							
				0.90	55.80		End of Pit at 0.90m

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Trial Pit Photographs



TP203 Pit



TP203 Arising

Remarks: 1. Terminated due to concrete obstruction at 0.90 m bgl. 2. Water strike encountered at 0.60m bgl as perched groundwater.

Stability: Stable

Trial Pit Log

			TrialPit No TP204 Sheet 1 of 1
Project Name: Riverpark	Project No. 17-246	Co-ords: 387419.00 - 399421.00 Level: 56.80	Date 19/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 × 0.80 Depth 1.60	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00	56.80		MADE GROUND: Concrete reinforced with 10mm rebar.
	0.30	ES		0.30	56.50		
				0.40	56.40		MADE GROUND: Brown gravelly fine to medium sand. Gravel is fine to medium subangular to subrounded of sandstone, brick, and concrete. MADE GROUND: Concrete.
				0.80	56.00		MADE GROUND: Brown slightly gravelly sandy clay. Gravel is fine to medium subangular of brick, concrete, and clinker, with fragments of metal pipe.
▼ 1.30	1.20	D					
	1.30	ES					
				1.60	55.20		End of Pit at 1.60m

Trial Pit Photographs



TP204 Pit



TP204 Arising

Remarks: 1. Terminated due to water ingress. 2. Water strike encountered at 1.30m bgl (northern wall, moderate ingress). 3. Concrete obstruction removed with the aid of the breaker.

Stability: Stable

Trial Pit Log

TrialPit No: TP205
Sheet 1 of 1

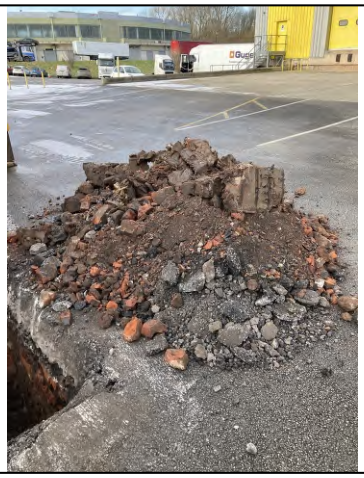
Project Name: Riverpark	Project No. 17-246	Co-ords: 387357.00 - 399413.00 Level: 58.00	Date 18/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 × 0.80, Depth 1.50	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	57.90		MADE GROUND: Asphalt.
				0.25	57.75		MADE GROUND: Greyish brown sandy gravel. Gravel is fine to medium subangular of sandstone (MOT subbase).
	0.50	ES					MADE GROUND: Black gravelly fine to medium sand. Gravel is fine to medium subangular of sandstone, mudstone, brick, concrete, clinker, ash, and fragments of timber. (Compacted).
				0.80	57.20		MADE GROUND: Brown slightly sandy slightly gravelly clay. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. (Reworked clay).
	1.00	HVP	127				
▼ 1.40	1.30	HVP	151				
				1.50	56.50		MADE GROUND: Yellowish brown sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
				1.50	56.50		End of Pit at 1.50m

Trial Pit Photographs



TP205 Pit



TP205 Arising

Remarks: 1. Terminated due to the presence of potential service gravel at 1.50 m bgl. 2.Water strike encountered at 1.40m bgl as seepage within MOT gravel. 3. Made Ground compacted between 0.25-0.80m bgl.

Stability: Stable

Trial Pit Log

TrialPit No: TP206
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387300.00 - 399466.00 Level: 55.50	Date 19/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 × 0.80 Depth 1.90	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	55.35		MADE GROUND: Asphalt.
	0.50	ES					MADE GROUND: Black gravelly fine to medium. Gravel is fine to medium subangular of sandstone and mudstone, brick, concrete, ash, clinker. Frequent cobbles of angular brick.
▼ 1.00				0.80	54.70		MADE GROUND: Stiff brown slightly sandy slightly gravelly clay. Gravel is fine subangular to subrounded of sandstone, mudstone, rare coal, and brick. (Reworked clay).
▼ 1.70				1.90	53.60		End of Pit at 1.90m

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Trial Pit Photographs



TP206 Pit



TP206 Arising

Remarks: 1. Terminated due to water ingress. Water strike encountered at 1.00m bgl as perched groundwater and at 1.70m bgl (fast ingress). 3. Made Ground compacted between 0.15-0.80m bgl.

Stability: Unstable from 0.30-0.80m bgl.

Trial Pit Log

			TrialPit No TP207 Sheet 1 of 1
Project Name: Riverpark	Project No. 17-246	Co-ords: 387373.00 - 399504.00 Level: 58.60	Date 19/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 x 0.80 Depth 1.60	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.10	58.50		MADE GROUND: Asphalt.
				0.30	58.30		MADE GROUND: Black gravelly fine to medium sand. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, brick, concrete, clinker, ash. Occasional cobbles of subangular sandstone.
				0.50	58.10		MADE GROUND: Brown slightly gravelly sandy clay. Gravel is medium subangular brick. (Reworked clay).
	0.90	ES					Stiff brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone. (Friable).
	1.30	B					
				1.60	57.00		End of Pit at 1.60m

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Trial Pit Photographs



TP207 Pit



TP207 Arising

Remarks: 1. Complete. 2. Friable CLAY impeaded the use of Hand shear vane.

Stability: Stable

Trial Pit Log

TrialPit No: TP208 / SA201
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387096.00 - 399489.00 Level: 60.00	Date 19/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.10 × 0.70, Depth 1.80	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	59.90		MADE GROUND: Asphalt.
				0.25	59.75		MADE GROUND: Yellowish brown sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone (MOT subbase).
	0.40	ES		0.50	59.50		MADE GROUND: Black gravelly fine to medium sand. Gravel is fine to medium subangular to subrounded of sandstone, brick, concrete, ash, and clinker.
				0.70	59.30		MADE GROUND: Stiff brown mottled grey slightly gravelly clay. Gravel is fine to medium subangular of brick and concrete. (Reworked clay)
	1.00	HVP	115				Stiff high strength brown slightly sandy CLAY.
	1.50	ES					
	1.50	HVP	142				
				1.80	58.20		End of Pit at 1.80m

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Trial Pit Photographs



TP208 Pit



SA208 Arising

Remarks: 1. Complete. 2. Soakaway conducted.

Stability: Stable

Trial Pit Log

TrialPit No: TP209
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387315.00 - 399490.00 Level: 56.70	Date 18/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 x 0.80 Depth 1.50	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	56.60		MADE GROUND: Asphalt.
	0.20	ES					MADE GROUND: Dark greyish brown slightly gravelly fine to medium sand. Gravel is fine to medium subangular of sandstone, brick, and concrete.
				0.40	56.30		Stiff brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular subrounded of sandstone, mudstone, and rare coal. (Becoming more sandy at 1.00 mbgl.) (Friable).
	1.30	ES					
				1.50	55.20		End of Pit at 1.50m

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Trial Pit Photographs



TP209 Pit



TP209 Arising

Remarks: 1. Complete. 2. Friable CLAY impeaded the use of Hand shear vane.

Stability: Stable

Trial Pit Log

TrialPit No TP210 / SA202
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387290.00 - 399521.00 Level: 58.80	Date 18/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 1.90 × 0.60 Depth 1.70	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.10	58.70		MADE GROUND: Asphalt.
							MADE GROUND: Black gravelly fine to medium sand. Gravel is fine subangular to subrounded of sandstone, brick, concrete, clinker and ash.
				0.70	58.10		Stiff high strength brown slightly sandy slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone, and coal.
	1.00	HVP	137				
	1.20	ES					
	1.50	HVP	152				
				1.70	57.10		End of Pit at 1.70m

Remarks: 1. Complete. 2. Soakaway conducted.

Stability: Stable

Trial Pit Log

TrialPit No: TP211
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387232.00 - 399537.00 Level: 59.30	Date 18/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 × 0.80 Depth 1.95	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	59.20		MADE GROUND: Asphalt.
	0.20 0.30	ES B					MADE GROUND: Dark greyish brown slightly gravelly fine to medium sand. Gravel is fine to medium subangular of sandstone, brick, and concrete.
				0.70	58.60		Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone, and rare coal. (Becoming very stiff very high strength from circa 1.40 m bgl.)
	1.00 1.00 1.00	D ES HVP	128				
	1.40	HVP	155				
	1.80	HVP	188				
				1.95	57.35		End of Pit at 1.95m

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Trial Pit Photographs



TP211 Pit



TP211 Arising

Remarks: 1. Complete.

Stability: Stable

Trial Pit Log

TrialPit No: TP212
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387163.00 - 399521.00 Level: 59.50	Date 18/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 x 0.80 Depth 2.10	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	59.40		MADE GROUND: Asphalt.
	0.40	ES					MADE GROUND: Dark brownish black gravelly fine to medium sand. Gravel is fine subangular to subrounded of sandstone, mudstone, brick , concrete, ash, and clinker.
	0.70	HVP	121	0.60	58.90		MADE GROUND: Brown slightly gravelly slightly sandy clay. Gravel is medium subangular of brick with fragments of timber beam. (Reworked).
	1.20	HVP	133	1.00	58.50		Stiff high brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone. (Becoming very stiff very high strength from circa 1.50 m bgl.)
	1.50	ES					
	1.60	HVP	179				
	2.00	HVP	179				
				2.10	57.40		End of Pit at 2.10m

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Trial Pit Photographs



TP212 Pit



TP212 Arising

Remarks: 1. Complete.

Stability: Stable

Trial Pit Log

TrialPit No: TP213
Sheet 1 of 1

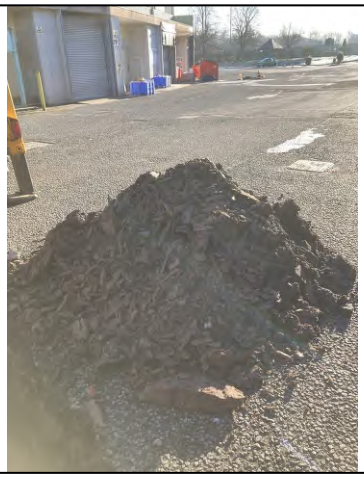
Project Name: Riverpark	Project No. 17-246	Co-ords: 387140.00 - 399482.00 Level: 59.60	Date 18/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 × 0.80, Depth 1.10	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	59.50		MADE GROUND: Asphalt.
							MADE GROUND: Dark greyish brown slightly gravelly fine to medium sand. Gravel is fine to medium subangular of sandstone, brick, and concrete with fragments of plastic.
				0.60	59.00		Very stiff very high strength brown sandy slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone, and rare coal.
	0.80	ES		0.80			
	0.80	HVP	152				
	1.00	HVP	188				Very stiff very high strength brown sandy slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone, and rare coal.
				1.10	58.50		End of Pit at 1.10m
				1.11	58.49		

Trial Pit Photographs



TP213 Pit



TP213 Arising

Remarks: 1. Terminated due to stiff CLAY.

Stability: Stable

Trial Pit Log

			TrialPit No TP214 Sheet 1 of 1
Project Name: Riverpark	Project No. 17-246	Co-ords: 387153.00 - 399447.00 Level: 59.40	Date 17/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 × 0.80 Depth 1.70	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

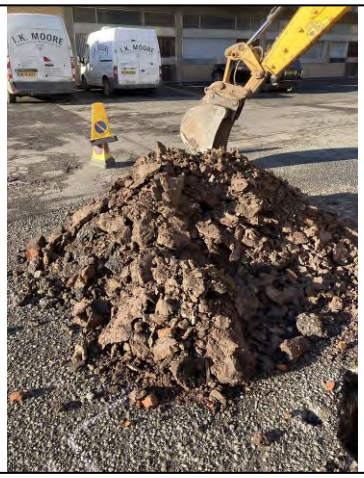
Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10	59.30		MADE GROUND: Asphalt.
	0.20	ES					MADE GROUND: Dark greyish brown slightly gravelly fine to medium sand. Gravel is fine to medium subangular of sandstone, brick, and concrete.
				0.40	59.00		Stiff brown slightly sandy slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone, and coal. (Friable)
	1.10	ES					
				1.70	57.70		End of Pit at 1.70m

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Trial Pit Photographs



TP214 Pit



TP214 Arising

Remarks: 1. Complete. 2. Friable CLAY impeaded the use of Hand shear vane.

Stability: Stable

Trial Pit Log

			TrialPit No TP215 Sheet 1 of 1
Project Name: Riverpark	Project No. 17-246	Co-ords: 387041.00 - 399445.00 Level: 61.40	Date 17/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 x 0.80 Depth 2.65	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.40	B		0.75	60.65		MADE GROUND: Black sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, brick, asphalt, ash, and concrete, with fragments of plastic.
	0.80	ES					MADE GROUND: Black gravelly clayey fine to medium sand. Gravel is fine to medium subangular to subrounded of sandstone and brick with fragments of plastic and shells.
2.00	2.10	HVP	81	1.90	59.50		Stiff high strength brown mottled grey sandy gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.
	2.40	ES					
	2.50	HVP	98				
				2.65	58.75		End of Pit at 2.65m

1 2 3 4

Trial Pit Photographs



TP215 Pit



TP115 Arising

Remarks: 1. Complete. 2. Water strike encountered at 2.00m bgl as perched groundwater (slow ingress). 3. Made Ground compacted from ground level to 0.75m bgl.

Stability: Stable

Trial Pit Log

TrialPit No: TP216
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387046.00 - 399481.00 Level: 61.70	Date 17/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 x 0.80 Depth 3.20	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.15	ES		0.10 0.20	61.60 61.50		MADE GROUND: Black asphalt gravel. MADE GROUND: Brown sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone. (MOT subbase).
				0.60	61.10		MADE GROUND: Black slightly clayey gravelly fine to medium sand. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, brick, concrete, ash, and clinker.
	0.80	HVP	97				MADE GROUND: Light grey mottled brown slightly gravelly clay. Gravel is fine subangular to subrounded of mudstone, brick, and coal, with fragments of timber. (Reworked).
	1.00	B					
▼ 1.20	1.20	HVP	88				
	1.80	HVP	65				
	2.00	ES					
	2.40	HVP	104				
	3.00	HVP	110				
				3.20	58.50		End of Pit at 3.20m

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Trial Pit Photographs



TP216 Pit



TP216 Arising

Remarks: 1. Complete. 2. Limit of excavator reached. 3. Water strike encountered at 1.20m bgl as perched groundwater.

Stability: Stable

Trial Pit Log

TrialPit No: TP217
Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387122.00 - 399546.00 Level: 60.30	Date 19/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 × 0.80 Depth 1.80	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.15	60.15		MADE GROUND: Asphalt.
	0.30	ES					MADE GROUND: Brownish black gravelly fine to medium sand. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, brick, ash, concrete and clinker.
				0.70	59.60		Stiff high strength brown sandy CLAY.
	1.00 1.10	HVP ES	110				
				1.80	58.50		End of Pit at 1.80m

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Trial Pit Photographs



TP217 Pit



TP217 Arising

Remarks: 1. Complete.

Stability: Stable

Trial Pit Log

			TrialPit No TP218 Sheet 1 of 1
Project Name: Riverpark	Project No. 17-246	Co-ords: 387208.00 - 399401.00 Level: 59.40	Date 19/01/2024
Location: Riverpark Trading Estate, Manchester		Dimensions (m): 2.00 x 0.80 Depth 2.10	Scale 1:30
Client: Kellen Homes			Logged G. CALVERT

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.10	59.30		MADE GROUND: Asphalt. MADE GROUND: Concrete.
				0.40	59.00		MADE GROUND: Yellowish brown sandy gravel. Gravel is fine to medium subangular of sandstone and brick. (MOT subbase).
				0.60	58.80		Stiff high strength brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone, and coal. (Becoming very stiff very high strength from circa 1.80 m bgl.)
	0.90	HVP	121				
	1.30	HVP	146				
	1.40	ES					
	1.50	D					
	1.80	HVP	169				
	2.00	HVP	164				
				2.10	57.30		End of Pit at 2.10m

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Trial Pit Photographs



TP218 Pit



TP118 Spoil

Remarks: 1. Complete.

Stability: Stable

Borehole Log

Borehole No. **WS201**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387472.00 - 399476.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level:	Scale 1:50
Client: Kellen Homes		Dates: 18/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40			MADE GROUND: Concrete.
					0.60			MADE GROUND: Black slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular of brick.
		1.00 1.00	D	N=9 (1,2/2,2,2,3)				MADE GROUND: Stiff high strength brown slightly gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, and brick. (Reworked).
		2.00 2.00	D	N=12 (2,3/3,2,3,4)				
					2.30			Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone with rare subangular cobbles of sandstone from 3.2m bgl.
		2.70	ES					
		3.00 3.00	D	N=23 (3,4/4,5,6,8)				Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone with rare subangular cobbles of sandstone from 3.2m bgl.
		4.00 4.00	D	50 (5,9/50 for 275mm)	4.00			
					4.43			End of borehole at 4.43 m

Remarks

1. Refusal due to inferred cobble. 2. Monitoring well installed. 3. Response zone 1.00 - 2.00m bgl.

Borehole Log

Borehole No. **WS202**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387511.00 - 399480.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level:	Scale 1:50
Client: Kellen Homes		Dates: 18/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40			MADE GROUND: Concrete.
					0.60			MADE GROUND: Black slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular of brick.
		1.00 1.00	D	N=19 (3,3/3,4,6,6)	0.90			MADE GROUND: Brown slightly gravelly clay. Gravel is fine subangular to subrounded of sandstone, brick, and coal.
		1.30 1.50 - 2.00	ES+L U					Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
		2.00 2.00	D	N=47 (5,6/8,10,13,16)				Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
		3.00 3.00	D	50 (4,4/50 for 275mm)	3.43 3.45			End of borehole at 3.43 m

Remarks

1. Refusal due to stiff CLAY. 2. Monitoring well installed. 3. Response zone 1.00 - 3.00m bgl.

Borehole Log

Borehole No. **WS203**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387503.00 - 399439.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level:	Scale 1:50
Client: Kellen Homes		Dates: 18/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.60	ES		0.40			MADE GROUND: Concrete.
		1.00 1.00	D	N=6 (1,1/1,1,2,2)	0.80 1.10			MADE GROUND: Reddish brown slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular to subrounded of brick.
	▼				1.60			MADE GROUND: Dark brown slightly gravelly slightly sandy clay. Gravel is fine to medium subangular of brick.
					1.80			MADE GROUND: Loose reddish brown slightly clayey slightly gravelly fine to medium sand. Gravel is fine of sandstone, mudstone, and brick.
		2.00 2.00	D	N=15 (2,2/3,3,4,5)	2.00			MADE GROUND: Black slightly gravelly fine to medium sand. Gravel is fine to medium subangular to subrounded of brick. (Saturated).
								MADE GROUND: Dark brown slightly sandy slightly gravelly clay. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, brick, and coal.
		3.00 3.00	D	50 (6,7/50 for 275mm)	3.00 3.43			Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
								Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
								End of borehole at 3.43 m

Remarks

1. Refusal due to stiff CLAY. 2. Water strike encountered at 1.60m bgl as perched groundwater. 3. Saturated ground between 1.60-1.80m bgl. 4. Monitoring well installed. 5. Response zone 0.50 - 1.50m bgl.

Borehole Log

Borehole No. **WS204**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387474.00 - 399423.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level: 56.70	Scale 1:50
Client: Kellen Homes		Dates: 18/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.50	56.20		MADE GROUND: Concrete.
		0.60	ES		0.70	56.00		MADE GROUND: Reddish brown slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular of brick.
		1.00 1.00	D	N=5 (1,2/2,1,1,1)				MADE GROUND: Very stiff very high strength brown slightly gravelly clay. Gravel is fine to medium subangular to subrounded of brick and coal with fragments of rubber.
		1.80	ES					
		2.00 2.00	D	N=17 (3,2/3,4,4,6)	2.20	54.50		Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone with rare subangular cobbles of sandstone from 2.9m bgl.
		3.00 3.00	D	N=31 (4,4/6,7,7,11)				Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone with rare subangular cobbles of sandstone from 2.9m bgl.
		3.80 3.80	D	50 (15,10/50 for 25mm)	3.80 3.98	52.90 52.72		End of borehole at 3.98 m

Remarks
1. Refused on inferred cobble.

Borehole Log

Borehole No. **WS205**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387369.00 - 399413.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level: 57.90	Scale 1:50
Client: Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	57.60		MADE GROUND: Asphalt.
					0.70	57.20		MADE GROUND: Light brown sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone and mudstone with brick at 0.6m bgl. (MOT subbase).
		1.00 1.00 1.30	D ES	N=8 (2,2/2,2,2,2)	1.00	56.90		MADE GROUND: Reddish brown slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular of brick.
		2.00		N=15 (3,6/4,4,3,4)				MADE GROUND: Stiff medium to high strength brown slightly gravelly clay. Gravel is fine to medium subangular of brick. (Reworked).
					2.30	55.60		Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
		3.00 3.00 3.10 3.50 - 4.00	D ES U	N=28 (3,3/5,6,8,9)				Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
		4.00 4.00	D 	N=46 (3,4/11,12,11,12)				
		5.00 5.00	D 	50 (8,10/50 for 275mm)	5.00	52.90		
					5.43	52.47		End of borehole at 5.43 m

Remarks

1. Refusal due to stiff CLAY. 2. Monitoring well installed. 3. Response zone 1.00 - 2.00m bgl.

Borehole Log

Borehole No. **WS206**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387312.00 - 399470.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level: 56.00	Scale 1:50
Client: Kellen Homes		Dates: 18/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	55.70		MADE GROUND: Asphalt.
								No Recovery. Assumed MADE GROUND: Gravelly fine to medium sand.
		1.00		N=27 (3,3/6,6,8,7)				No Recovery. Assumed MADE GROUND: Gravelly fine to medium sand.
		1.80		50 (25,25/50 for 5mm)	1.80 1.96	54.20 54.04		End of borehole at 1.96 m

Remarks
1. Refusal due to obstruction.

Borehole Log

Borehole No. **WS207**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387193.00 - 399456.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level: 59.00	Scale 1:50
Client: Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	58.80		MADE GROUND: Asphalt.
		0.40	ES		0.40	58.60		MADE GROUND: Concrete.
					0.50	58.50		MADE GROUND: Light grey sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. (MOT subbase).
		1.00	D					
		1.00		N=26 (2,3/4,6,8,8)				Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.
		1.50 - 2.00	U					
								Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.
		2.00	D					
		2.00		N=31 (3,5/6,7,8,10)				
		2.40	ES					
		3.00		N=44 (5,6/8,9,11,16)				
		3.50		50 (5,6/50 for 275mm)	3.60	55.40		
		3.60	D					
					3.93	55.07		End of borehole at 3.93 m

Remarks

1. Refusal due to stiff CLAY. 2. Monitoring well installed. 3. Response zone 0.50 - 3.00m bgl.

Borehole Log

Borehole No. **WS208**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387229.00 - 399458.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level: 59.00	Scale 1:50
Client: Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	58.80		MADE GROUND: Asphalt.
					0.30	58.70		MADE GROUND: Concrete.
					0.60	58.40		MADE GROUND: Grey slightly sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, and brick. (MOT subbase).
		0.80	ES+L					
		1.00	D					
		1.00		N=16 (3,2/3,3,4,6)	1.10	57.90		MADE GROUND: Reddish brown slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular of brick.
								Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.
		2.00	D					Very stiff very high strength brown slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.
		2.00		N=20 (4,3/3,4,5,8)				
		2.30	ES					
		3.00	D					
		3.00		N=32 (4,5/6,6,8,12)				
		4.00		N=30 (4,4/6,6,8,10)				
		5.00	D		5.00	54.00		
		5.00		N=36 (4,5/6,8,9,13)				
					5.45	53.55		End of borehole at 5.45 m

Remarks
1. Complete.

Borehole Log

Borehole No. **WS209**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387215.00 - 399473.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level: 58.80	Scale 1:50
Client: Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	58.60		MADE GROUND: Asphalt.
					0.40	58.40		MADE GROUND: Concrete.
		0.50	ES		0.60	58.20		MADE GROUND: Light grey slightly sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. (MOT subbase).
		1.00		N=14 (2,2/3,3,4,4)				Stiff high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of mudstone and sandstone. Becoming very stiff very high strength from 2.00 m bgl.
		2.00	D					Stiff high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of mudstone and sandstone. Becoming very stiff very high strength from 2.00 m bgl.
		2.00		N=21 (3,4/5,5,4,7)				
		3.00	D					
		3.00		N=22 (4,4/4,4,8,6)				
		3.20	ES					
		4.00	D					
		4.00		N=26 (4,4/5,6,7,8)				
		5.00	D		5.00	53.80		
		5.00		N=31 (4,5/6,7,8,10)				
					5.45	53.35		End of borehole at 5.45 m

Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 1.00 - 4.00m bgl.

Borehole Log

Borehole No. **WS210**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387229.00 - 399485.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level: 59.00	Scale 1:50
Client: Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40	58.60		MADE GROUND: Asphalt.
		0.70	ES		0.80	58.20		MADE GROUND: Light grey sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, and brick. (MOT subbase).
		1.00 1.00	D	N=13 (1,2/3,3,3,4)				Stiff high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of mudstone, sandstone, and coal with a 0.2m lense of brown fine to medium sand at 2.7m bgl. Becoming very stiff very high strength from 2.00 m bgl.
		2.00 2.00	D	N=26 (3,6/6,7,7,6)				Stiff high strength brown slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of mudstone, sandstone, and coal with a 0.2m lense of brown fine to medium sand at 2.7m bgl. Becoming very stiff very high strength from 2.00 m bgl.
		2.80	ES					
		3.00 3.00	D	N=29 (3,4/6,6,8,9)				
		4.00 4.00	D	N=33 (5,5/7,7,8,11)				
		5.00 5.00	D	N=37 (4,5/6,8,10,13)	5.00	54.00		
					5.45	53.55		End of borehole at 5.45 m

Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 0.50 - 1.00m bgl.

Borehole Log

Borehole No. **WS211**

Sheet 1 of 1

Project Name: Riverpark	Project No. 17-246	Co-ords: 387203.00 - 399491.00	Hole Type WS
Location: Riverpark Trading Estate, Manchester		Level: 58.90	Scale 1:50
Client: Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	58.70		MADE GROUND: Asphalt.
								MADE GROUND: Concrete.
		0.50	ES		0.50	58.40		
					0.70	58.20		MADE GROUND: Light grey sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. (MOT subbase).
		1.00 1.00	D	N=20 (3,4/4,5,5,6)				Very stiff very high strength rown slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone and coal.
		2.00 2.00	D	N=26 (3,4/5,6,6,9)				Very stiff very high strength rown slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone, mudstone and coal.
		3.00 3.00	D	N=30 (3,4/5,6,8,11)				
		4.00		N=35 (5,5/6,7,9,13)				
		4.50	ES					
		4.70 4.70	D	50 (9,12/50 for 275mm)	4.70	54.20		
					5.13	53.77		End of borehole at 5.13 m

Remarks

1. Refusal due to stiff CLAY. 2. Monitoring well installed. 3. Response zone 1.00 - 4.50m bgl.

Rotary Core Log

Borehole No. **CP/RB201**

Sheet 1 of 3

Project Name: Riverpark	Project No. 17-246	Co-ords: 387119.00 - 399431.00	Hole Type CP+RC
Location: Riverpark Trading Estate, Manchester		Level: 60.00mbgl Orientation: ° Inclination: °	Scale 1:75
Client: Kellen Homes		Dates: 23/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Depth (m)	Type / FI	Coring TCR	Coring SCR	Coring RQD	Results & Information	Depth (m)	Level (m)	Legend	Stratum Description
		0.30	D					0.20	59.80		MADE GROUND: Asphalt.
	▼										MADE GROUND: Black slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular brick.
		1.00	D				N=20 (2,3/4,5,5,6)	0.80	59.20		
		1.00									Very stiff very high strength brown slightly gravelly slightly sandy CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.
		2.00	D				N=27 (3,4/6,6,7,8)				
		2.00									
		3.00	B				N=31 (4,5/7,7,8,9)				
		3.00	D								
		3.00									
		4.00	D				N=40 (5,8/8,9,10,13)				
	▼	4.00									
		5.00	D				50 (5,6/50 for 285mm)				
		5.00									
		6.50	D				50 (5,9/50 for 220mm)				
		6.50									
		8.00	B				50 (6,9/50 for 255mm)				
		8.00	D								
		8.00									
		9.50	D				50 (7,9/50 for 255mm)				
		9.50									

Continued on next sheet

Remarks

1. Complete. 2. Cable refused at 9.90m bgl due to stiff CLAY. 3. Rotary open hole follow to 40.00 m bgl. 4. Water strike encountered at 0.70m bgl as perched groundwater and at 4.30m bgl as groundwater strike.

Rotary Core Log

Borehole No. **CP/RB201**

Sheet 2 of 3

Project Name: Riverpark	Project No. 17-246	Co-ords: 387119.00 - 399431.00	Hole Type CP+RC
Location: Riverpark Trading Estate, Manchester		Level: 60.00mbgl Orientation: ° Inclination: °	Scale 1:75
Client: Kellen Homes		Dates: 23/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Depth (m)	Type / FI	Coring TCR	Coring SCR	Coring RQD	Results & Information	Depth (m)	Level (m)	Legend	Stratum Description
								16.60	43.40		Light grey MUDSTONE with interbedded SANDSTONE.

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Continued on next sheet

Remarks

1. Complete. 2. Cable refused at 9.90m bgl due to stiff CLAY. 3. Rotary open hole follow to 40.00 m bgl. 4. Water strike encountered at 0.70m bgl as perched groundwater and at 4.30m bgl as groundwater strike.

Rotary Core Log

Borehole No.
CP/RB201
Sheet 3 of 3

Project Name: Riverpark	Project No. 17-246	Co-ords: 387119.00 - 399431.00	Hole Type CP+RC
Location: Riverpark Trading Estate, Manchester		Level: 60.00mbgl Orientation: ° Inclination: °	Scale 1:75
Client: Kellen Homes		Dates: 23/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Depth (m)	Type / FI	Coring TCR	Coring SCR	Coring RQD	Results & Information	Depth (m)	Level (m)	Legend	Stratum Description
								40.00	20.00		End of borehole at 40.00 m

Remarks
1. Complete. 2. Cable refused at 9.90m bgl due to stiff CLAY. 3. Rotary open hole follow to 40.00 m bgl. 4. Water strike encountered at 0.70m bgl as perched groundwater and at 4.30m bgl as groundwater strike.

Borehole Log

Borehole No. **CP202**

Sheet 1 of 2

Project Name: Riverpark	Project No. 17-246	Co-ords: 387093.00 - 399525.00	Hole Type CP
Location: Riverpark Trading Estate, Manchester		Level: 60.60	Scale 1:50
Client: Kellen Homes		Dates: 16/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	60.50		MADE GROUND: Asphalt.
		0.30	D					MADE GROUND: Light grey sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, and brick.
		1.00	B					
		1.00	D					
		1.00		N=5 (1,0/1,1,1,2)				
		1.50	B		1.50	59.10		MADE GROUND: Soft low strength brown sandy clay. (Reworked)
		2.00	D					MADE GROUND: Soft low strength brown sandy clay. (Reworked)
		2.00		N=4 (1,0/1,1,1,1)				
		3.00	D					
		3.00		N=4 (1,1/1,1,1,1)				
		4.00	D		4.00	56.60		Very stiff very high strength brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone with subangular cobbles of sandstone.
		4.00		N=17 (1,2/3,3,5,6)	4.30	56.30		Very stiff very high strength brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone with subangular cobbles of sandstone.
		4.50	B					
		5.00	D					
		5.00		N=20 (2,3/3,4,5,8)				
		6.50	D					
		6.50		N=28 (3,3/5,6,8,9)				
		8.00	D					
		8.00		N=38 (4,5/7,9,10,12)				
		9.50	B					
		9.50	D					
		9.50		50 (5,9/50 for 231mm)				

Continued on next sheet

Remarks

1. Refusal at 11.40m bgl due to stiff CLAY. 2. Monitoring well installed. 3. Response zone 3.30-4.30mbgl.

Borehole Log

Borehole No. **CP202**
Sheet 2 of 2

Project Name: Riverpark	Project No. 17-246	Co-ords: 387093.00 - 399525.00	Hole Type CP
Location: Riverpark Trading Estate, Manchester		Level: 60.60	Scale 1:50
Client: Kellen Homes		Dates: 16/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		11.00 11.00	B	60 (6,9/60 for 255mm)	11.40 11.40	49.20 49.20		End of borehole at 11.40 m

Remarks
1. Refusal at 11.40m bgl due to stiff CLAY. 2. Monitoring well installed. 3. Response zone 3.30-4.30mbgl.

Borehole Log

Borehole No. **CP203**

Sheet 1 of 2

Project Name: Riverpark	Project No. 17-246	Co-ords: 387165.00 - 399552.00	Hole Type CP
Location: Riverpark Trading Estate, Manchester		Level: 59.90	Scale 1:50
Client: Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	59.80		MADE GROUND: Asphalt.
		0.30	D					MADE GROUND: Light brown sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone, mudstone, and brick. (MOT subbase).
	▼	0.60	D		0.60	59.30		Stiff high strength brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone with subangular cobbles of sandstone. Becoming very stiff very high strength from 2.00 m bgl.
		1.00	B					
		1.00	D					
		1.00		N=14 (1,2/2,3,4,5)				
		2.00	D					
		2.00		N=19 (1,2/3,5,5,6)				
		3.00	D					
		3.00		N=21 (2,3/4,5,5,7)				
		4.00	D					
		4.00		N=24 (3,3/5,5,6,8)				
		5.00	B					
		5.00	D					
		5.00		N=31 (3,5/5,7,9,10)				
		6.50	D					
		6.50		N=33 (3,4/6,8,9,10)				
		8.00	D					
		8.00		N=40 (4,6/8,10,10,12)				
		9.50	B					
		9.50	D					
		9.50		50 (6,10/50 for 285mm)				

Continued on next sheet

Remarks

1. Refusal at 11.40m bgl due to stiff CLAY. 2. Water strike encountered at 0.60m bgl as perched groundwater.

Borehole Log

Borehole No. **CP203**
Sheet 2 of 2

Project Name: Riverpark	Project No. 17-246	Co-ords: 387165.00 - 399552.00	Hole Type CP
Location: Riverpark Trading Estate, Manchester		Level: 59.90	Scale 1:50
Client: Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		11.00 11.00	D	50 (6,9/50 for 255mm)	11.40	48.50		End of borehole at 11.40 m

Remarks
1. Refusal at 11.40m bgl due to stiff CLAY. 2. Water strike encountered at 0.60m bgl as perched groundwater.

Borehole Log

Borehole No. **RB202**

Sheet 1 of 4

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387338E - 399513N	Hole Type RO
Location:	Riverpark Trading Estate, Manchester		Level:	58.80 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	18/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	58.80		MADE GROUND: Asphalt.
					0.70	58.60		MADE GROUND: Black slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular of sandstone, mudstone, and brick.
					3.20	58.10		Brown slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.
								Grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.

1 2 3 4 5 6 7 8 9 10

Remarks

1. Complete.

Borehole Log

Borehole No. **RB202**

Sheet 2 of 4

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387338E - 399513N	Hole Type RO
Location:	Riverpark Trading Estate, Manchester		Level:	58.80 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	18/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					17.20	55.60		Light grey calcareous MUDSTONE with interbedded SANDSTONE.

11 12 13 14 15 16 17 18 19 20

Remarks

1. Complete.

Borehole Log

Borehole No. **RB202**

Sheet 3 of 4

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387338E - 399513N	Hole Type RO
Location:	Riverpark Trading Estate, Manchester		Level:	58.80 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	18/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				Light grey calcareous MUDSTONE with interbedded SANDSTONE.

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Remarks
1. Complete.

Borehole Log

Borehole No. **RB202**

Sheet 4 of 4

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387338E - 399513N	Hole Type RO
Location:	Riverpark Trading Estate, Manchester		Level:	58.80 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	18/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Light grey calcareous MUDSTONE with interbedded SANDSTONE.
					40.00	41.60		End of Borehole at 40.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Complete.

Borehole Log

Borehole No. **DBH201**

Sheet 1 of 2

Project Name: Riverpark	Project No. 17-246	Co-ords: 387488E - 399461N	Hole Type BH
Location: Riverpark Trading Estate, Manchester		Level:	Scale 1:50
Client: Kellen Homes		Dates: 17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25			MADE GROUND: Concrete.
								MADE GROUND: Loose Black slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular of brick.
					1.50			Stiff high strength brown slightly sandy CLAY. Becoming very stiff very high strength from 2.50 m bgl.
								Stiff high strength brown slightly sandy CLAY. Becoming very stiff very high strength from 2.50 m bgl.
					8.00			
					8.70			Very stiff very high strength grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. Occasional cobbles of subangular sandstone.
								End of Borehole at 8.00m

Remarks

1. Complete. 2. Pre-cored concrete before drilling. 3. Monitoring well installed. 4. Response zone 0.50-1.00m bgl.

Borehole Log

Borehole No. **DBH201**

Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387488E - 399461N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	Scale 1:50
Client:	Kellen Homes		Dates: 17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Very stiff very high strength grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. Occasional cobbles of subangular sandstone.
					15.00			

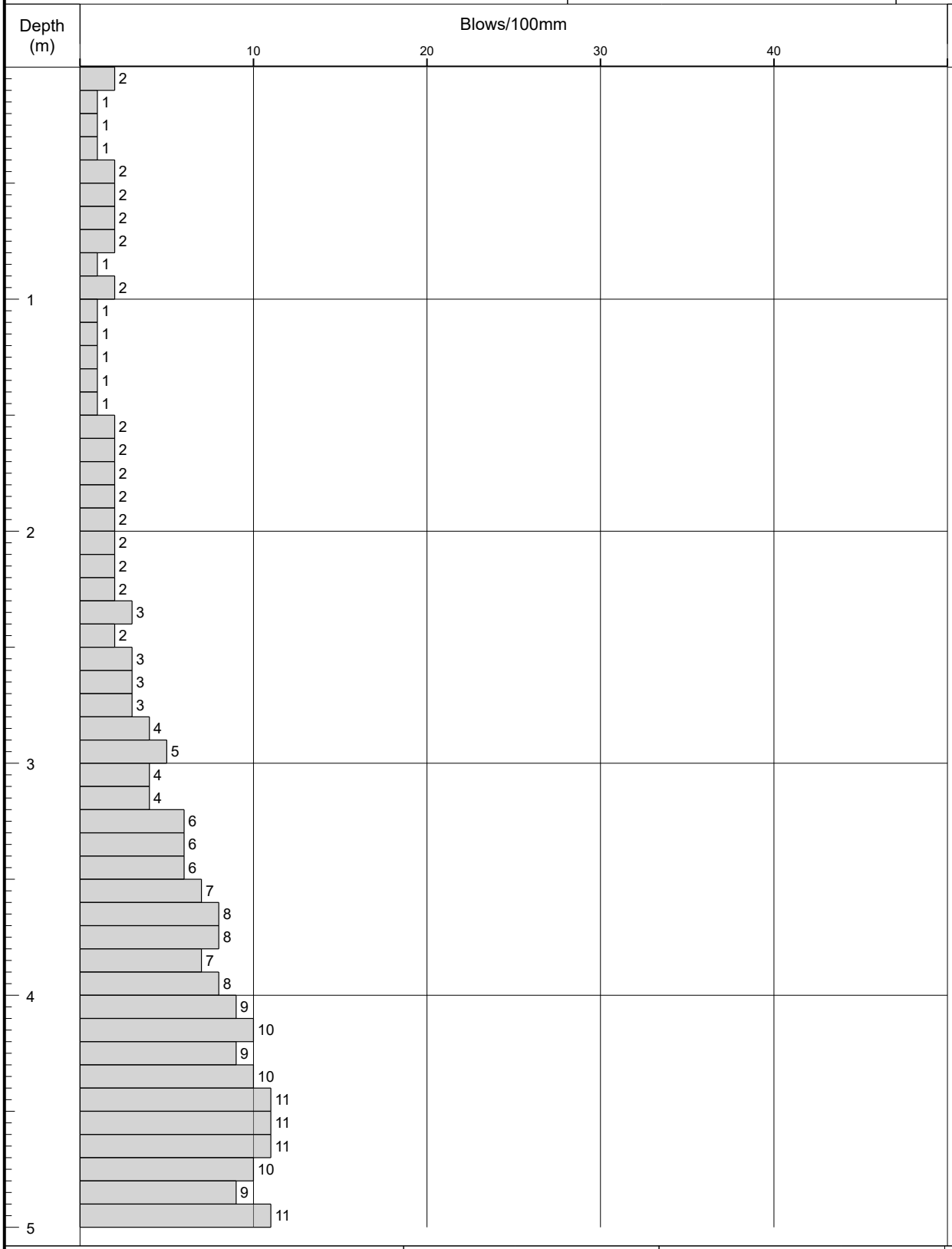
11 12 13 14 15 16 17 18 19 20

Remarks

1. Complete. 2. Pre-cored concrete before drilling. 3. Monitoring well installed. 4. Response zone 0.50-1.00m bgl.

Probe Log

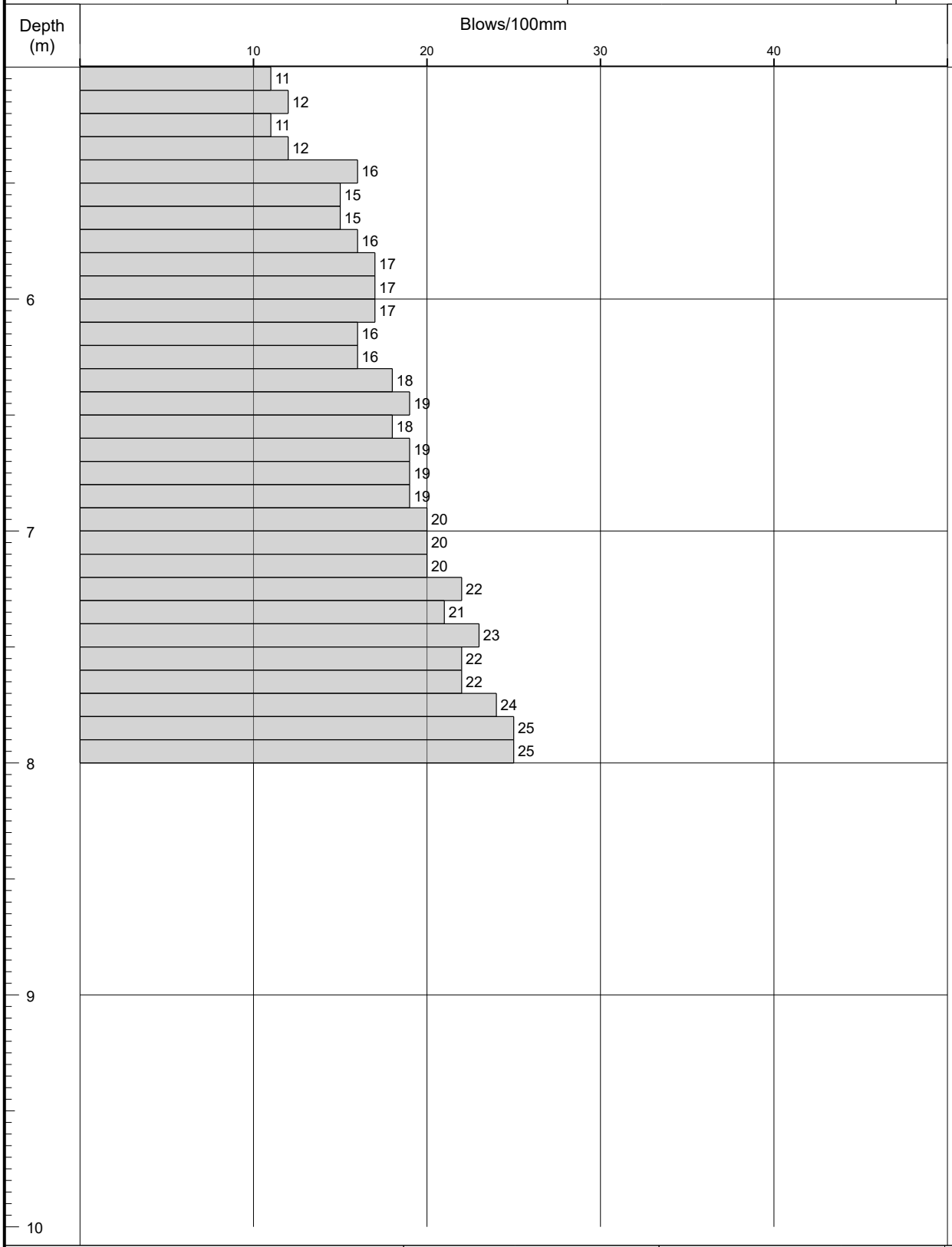
Borehole No. **DBH201** Sheet 1 of 2			
Project Name: Riverpark	Project No. 17-246	Co-ords: 387488.00 - 399461.00	Hole Type DP
Location: Riverpark Trading Estate, Manchester		Level:	Scale 1:25
Client: Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Logged By L. CALLISS



Remarks 1. Complete. 2. Pre-cored concrete before drilling. 3. Monitoring well installed. 4. Response zone 0.50-1.00m bgl.	Fall Height	Cone Base Diameter	
	Hammer Wt	Final Depth	8.00
	Probe Type	Log Scale	1:25

Probe Log

Project Name: Riverpark	Project No. 17-246	Co-ords: 387488.00 - 399461.00	Borehole No. **DBH201** Sheet 2 of 2
Location: Riverpark Trading Estate, Manchester		Level:	Hole Type DP
Client: Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Scale 1:25
			Logged By L. CALLISS



Remarks			
1. Complete. 2. Pre-cored concrete before drilling. 3. Monitoring well installed. 4. Response zone 0.50-1.00m bgl.	Fall Height	Cone Base Diameter	
	Hammer Wt	Final Depth	8.00
	Probe Type	Log Scale	1:25

Borehole Log

Borehole No. **DBH202**

Sheet 1 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387398E - 399422N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	56.80 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	56.80		MADE GROUND: Asphalt.
					0.50	56.60		MADE GROUND: Medium dense yellowish brown sandy gravel. Gravel is fine to medium subangular of sandstone and brick. (MOT subbase).
								MADE GROUND: Medium dense yellowish brown sandy gravel. Gravel is fine to medium subangular of sandstone and brick. (MOT sub-base).
					1.30	56.60		Stiff high strength brown slightly sandy CLAY. Becoming very stiff very high strength from 2.50 m bgl.
					5.00	55.50		End of Borehole at 5.00m

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Remarks

1. Complete.

Borehole Log

Borehole No. **DBH202**

Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387398E - 399422N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	56.80 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				

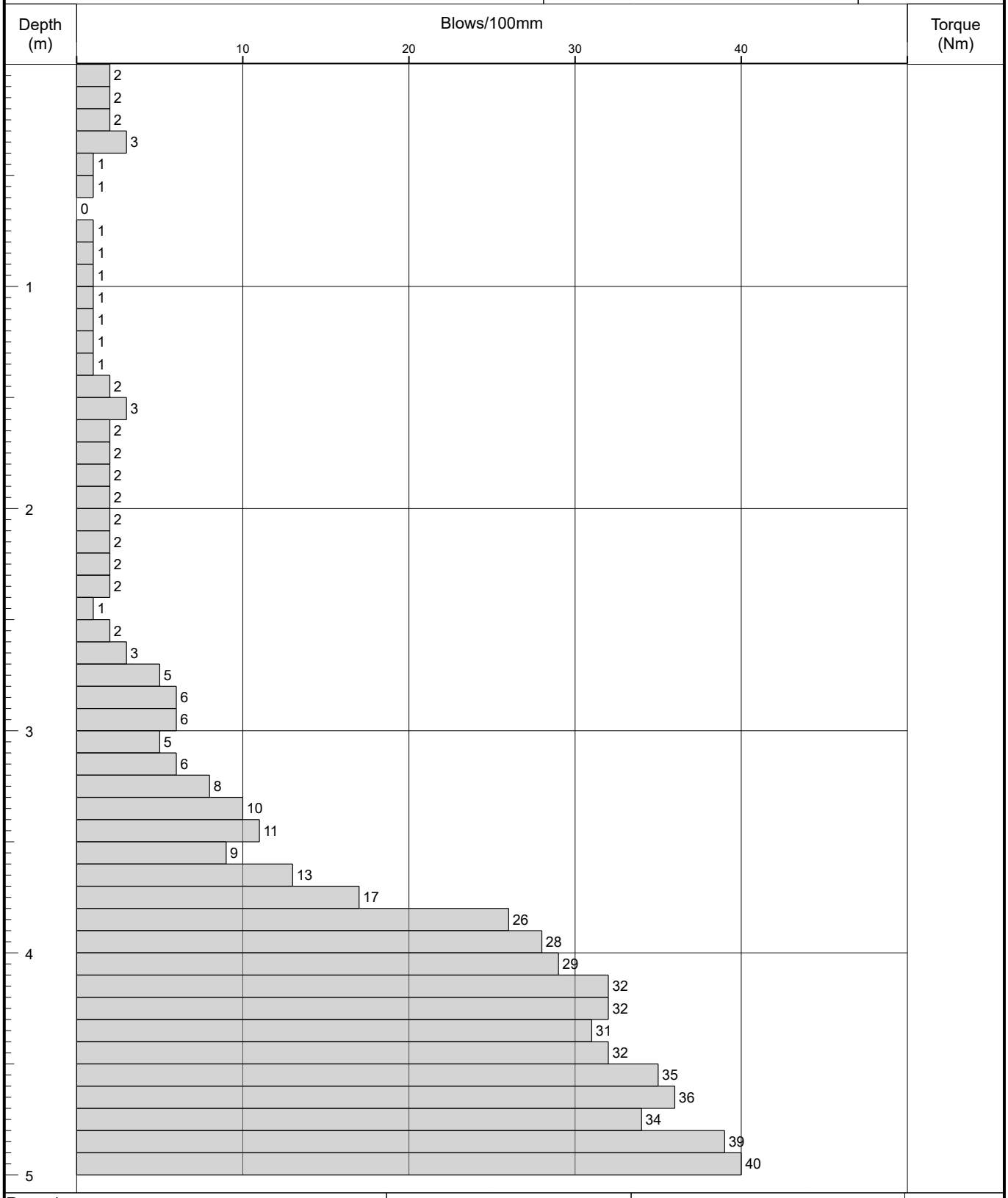
11
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Remarks
1. Complete.

Probe Log

Borehole No.
DBH202
Sheet 1 of 1

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387398.00 - 399422.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 56.80	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Logged By L. CALLISS



Remarks
1. Complete.

Fall Height		Cone Base Diameter	
Hammer Wt		Final Depth	5.00
Probe Type		Log Scale	1:25

Borehole Log

Borehole No. **DBH203**

Sheet 1 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387173E - 399410N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	59.40 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	59.40		MADE GROUND: Asphalt.
					0.40	59.20		MADE GROUND: Dense yellowish brown sandy gravel. Gravel is fine to medium subangular of sandstone and brick. (MOT subbase).
								MADE GROUND: Loose black slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular of sandstone, mudstone, and brick.
					1.10	59.00		MADE GROUND: Soft low strength brown sandy clay. (Reworked)
					2.00	58.30		Stiff high strength brown sandy CLAY.
					2.30	57.40		Very stiff very high strength grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
								Very stiff very high strength grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					7.00	57.10		End of Borehole at 7.00m

Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 0.50-1.00m bgl.

Borehole Log

Borehole No. **DBH203**

Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387173E - 399410N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	59.40 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Very stiff very high strength grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					15.00	57.10		

11 12 13 14 15 16 17 18 19 20

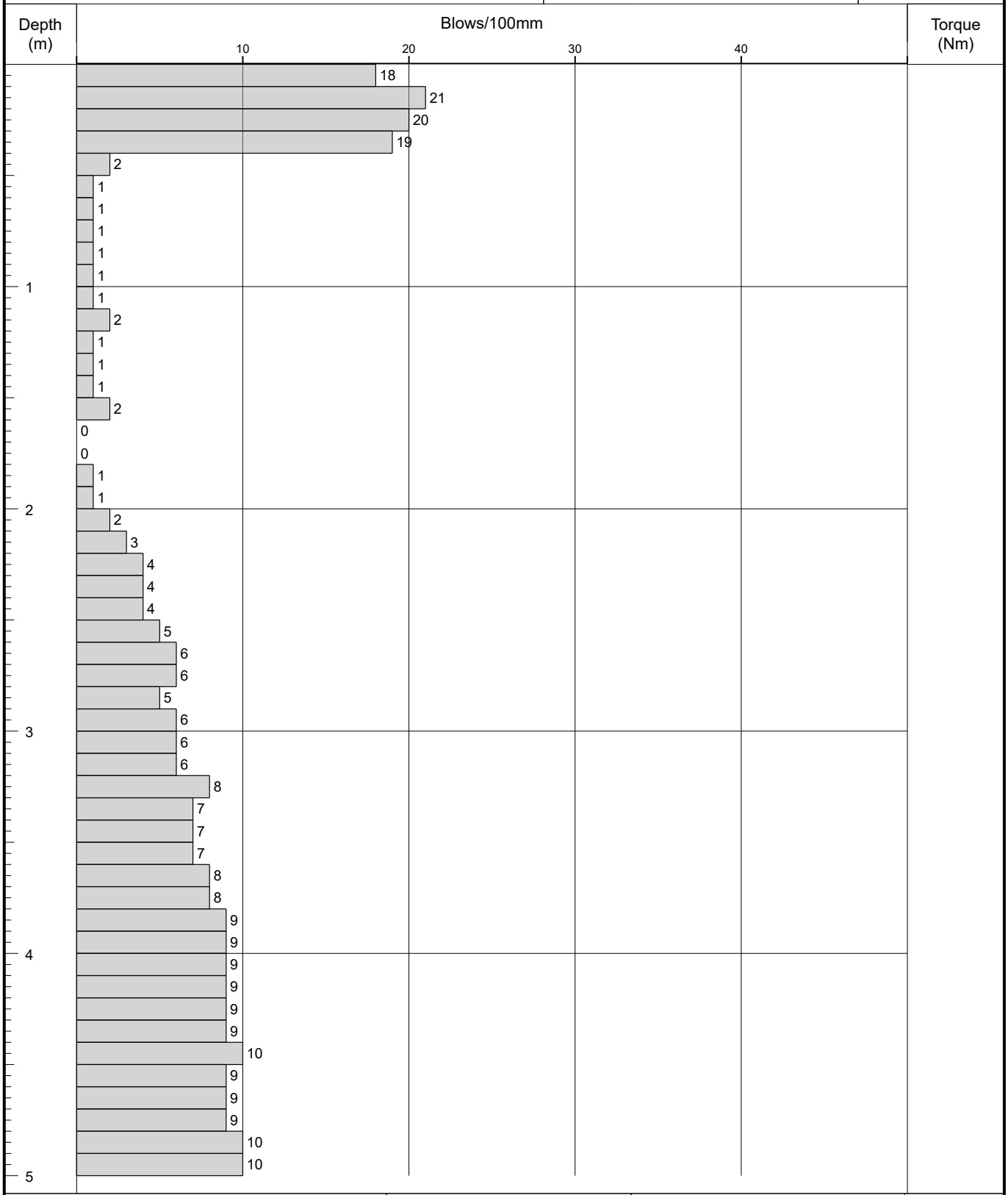
Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 0.50-1.00m bgl.

Probe Log

Borehole No.
DBH203
Sheet 1 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387173.00 - 399410.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 59.40	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Logged By L. CALLISS

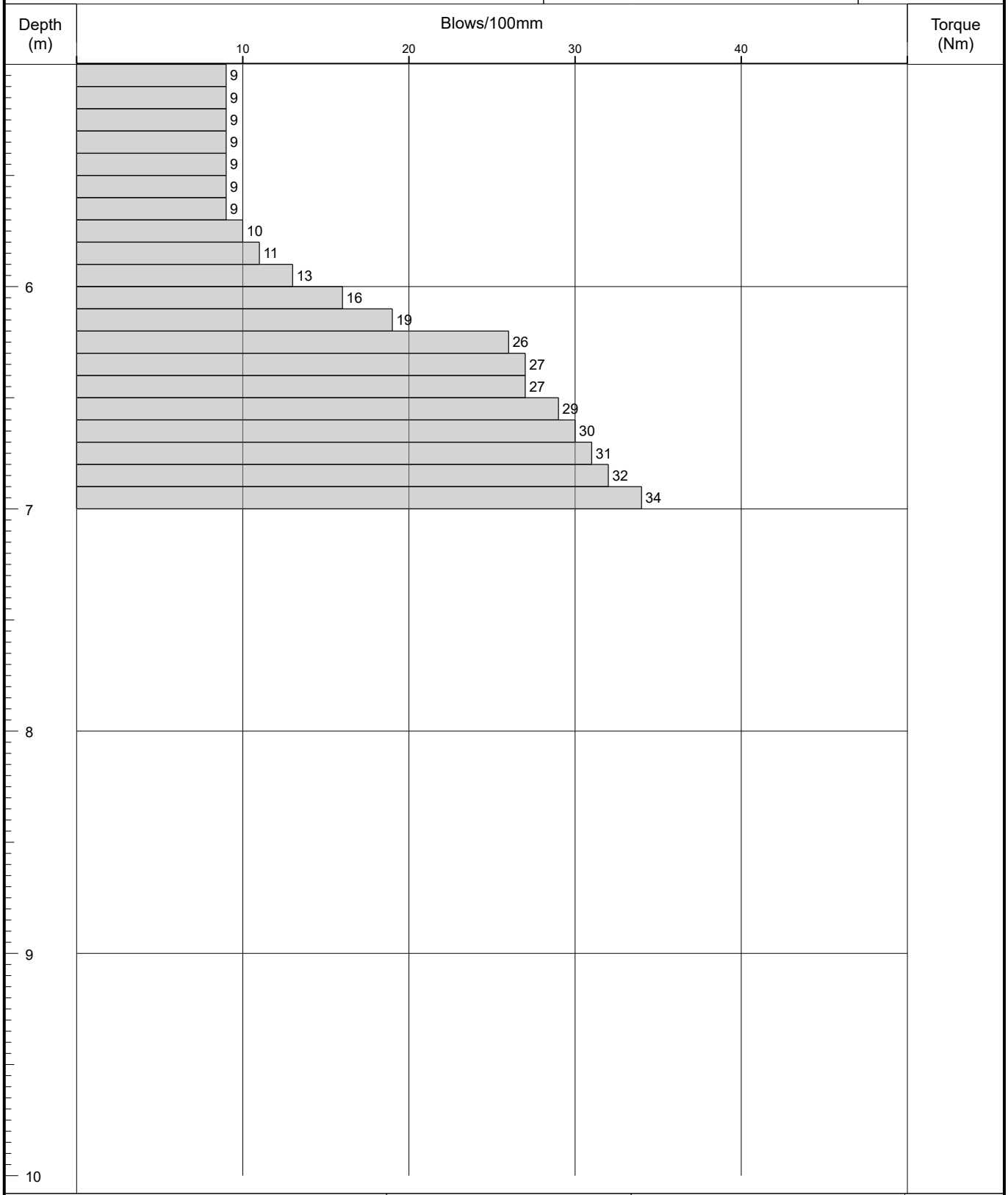


Remarks	Fall Height	Cone Base Diameter	
1. Complete. 2. Monitoring well installed. 3. Response zone 0.50-1.00m bgl.	Hammer Wt	Final Depth	7.00
	Probe Type	Log Scale	1:25

Probe Log

Borehole No.
DBH203
Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387173.00 - 399410.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 59.40	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Logged By L. CALLISS



Remarks		
1. Complete. 2. Monitoring well installed. 3. Response zone 0.50-1.00m bgl.	Fall Height	Cone Base Diameter
	Hammer Wt	Final Depth 7.00
	Probe Type	Log Scale 1:25

Borehole Log

Borehole No. **DBH204**

Sheet 1 of 1

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387473E - 399416N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	56.65 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND: Concrete.
					0.40	56.65		
					0.60	56.25		MADE GROUND: Medium dense yellowish brown sandy gravel. Gravel is fine to medium subangular of sandstone and brick. (MOT subbase).
								MADE GROUND: Soft low strength brown slightly gravelly clay. Gravel is fine to medium subangular to subrounded of brick and sandstone.
					2.40	56.05		Very Stiff very high strength brown sandy CLAY.
					4.00	54.25		Very stiff very high strength grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					8.00	52.65		End of Borehole at 8.00m

1 2 3 4 5 6 7 8 9 10

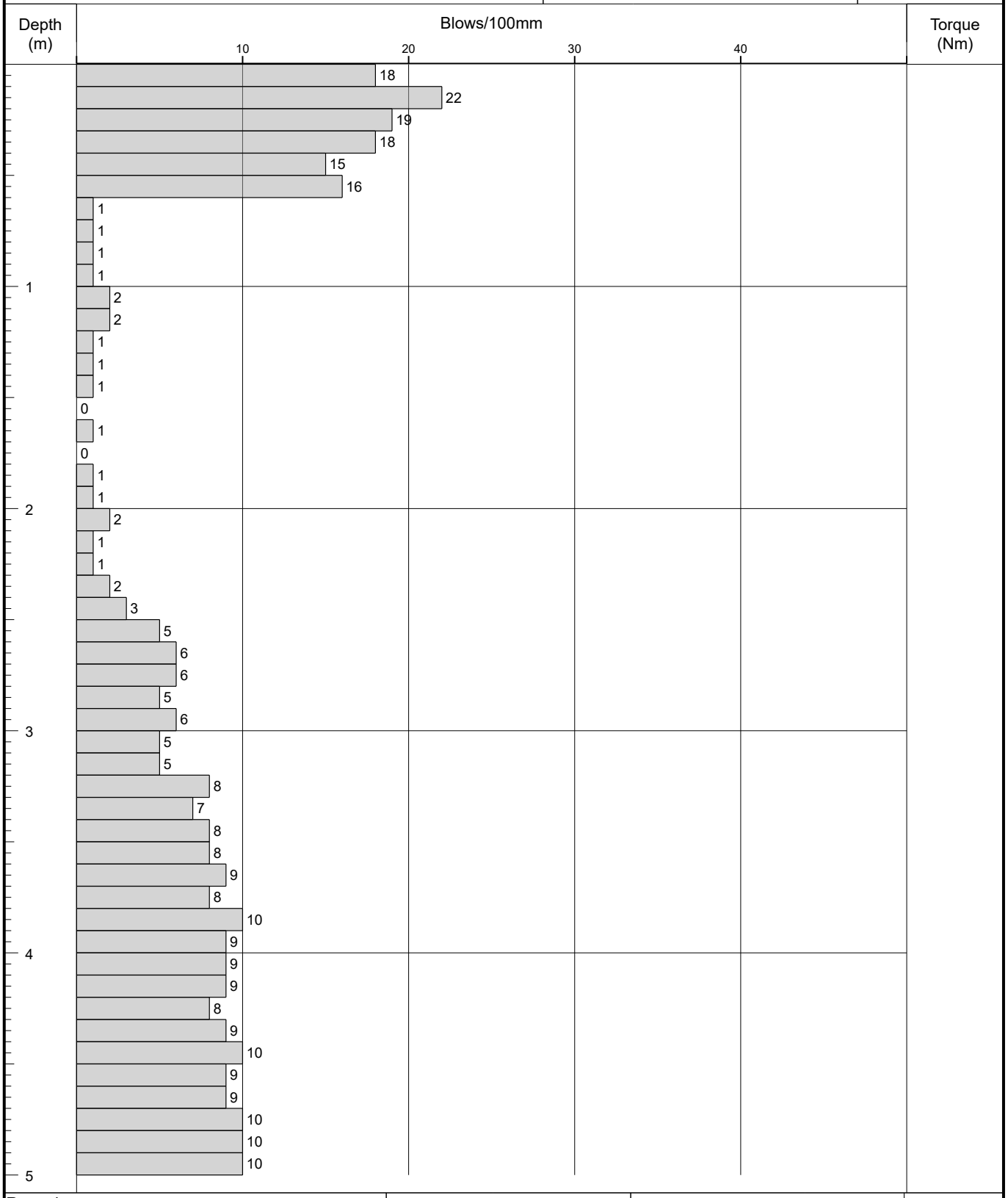
Remarks

1. Complete.

Probe Log

Borehole No.
DBH204
Sheet 1 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387473.00 - 399416.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 56.65	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS



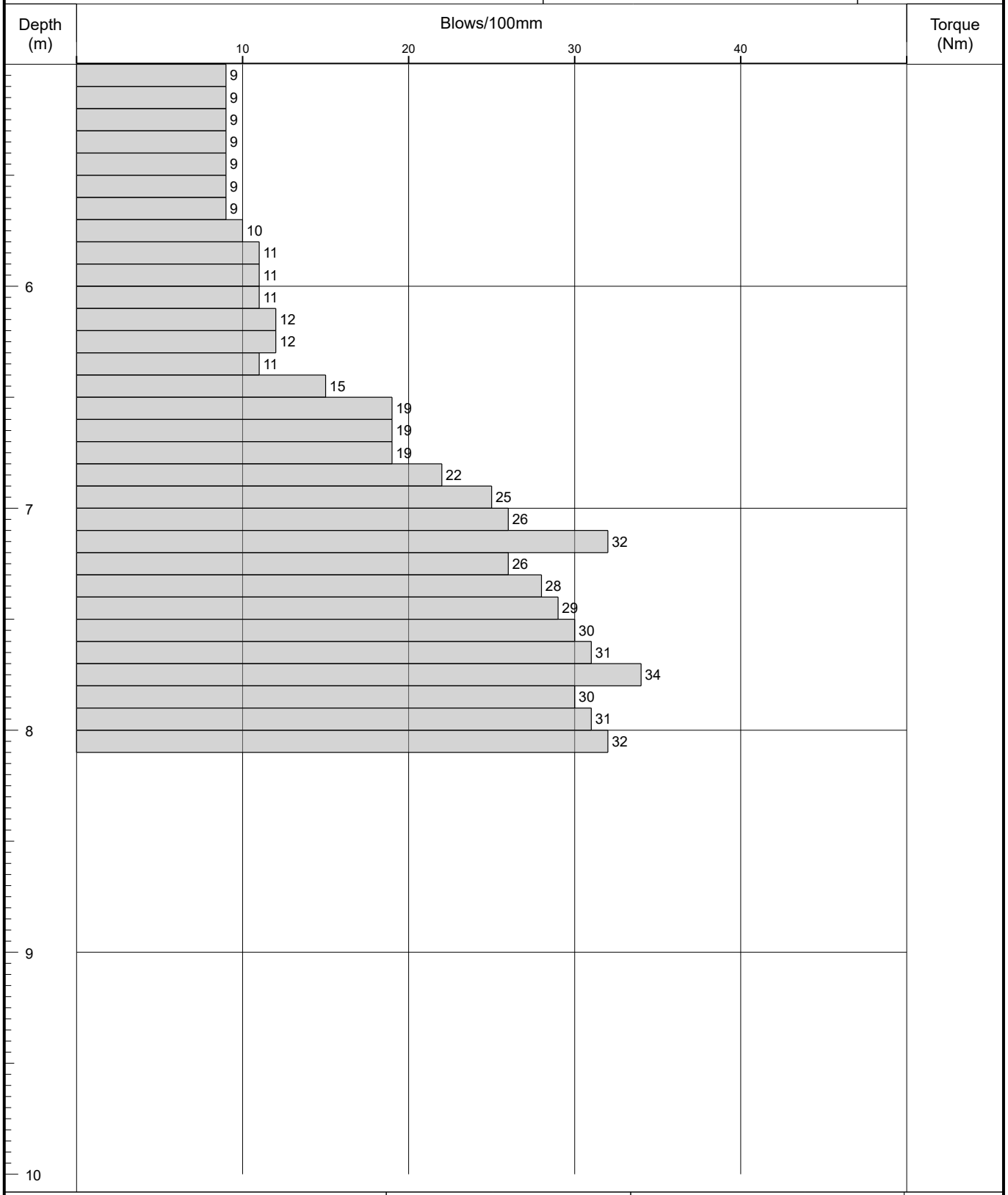
Remarks
1. Complete.

Fall Height		Cone Base Diameter	
Hammer Wt		Final Depth	8.00
Probe Type		Log Scale	1:25

Probe Log

Borehole No.
DBH204
Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387473.00 - 399416.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 56.65	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 -	Logged By L. CALLISS



Remarks
1. Complete.

Fall Height		Cone Base Diameter	
Hammer Wt		Final Depth	8.00
Probe Type		Log Scale	1:25

Borehole Log

Borehole No. **DBH205**

Sheet 1 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387299E - 399484N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	55.70 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	55.70		MADE GROUND: Asphalt.
					0.40	55.50		MADE GROUND: Medium dense yellowish brown sandy gravel. Gravel is fine to medium subangular of sandstone and brick. (MOT subbase).
					1.10	55.30		MADE GROUND: Medium dense grey slightly sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. (MOT subbase).
					2.30	54.60		Very stiff very high strength brown sandy CLAY.
								Very stiff very high strength grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					8.00	53.40		Very stiff very high strength grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
								End of Borehole at 8.00m

Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 0.50-1.00m bgl.

Borehole Log

Borehole No. **DBH205**

Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387299E - 399484N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	55.70 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Very stiff very high strength grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					15.00	53.40		

11 12 13 14 15 16 17 18 19 20

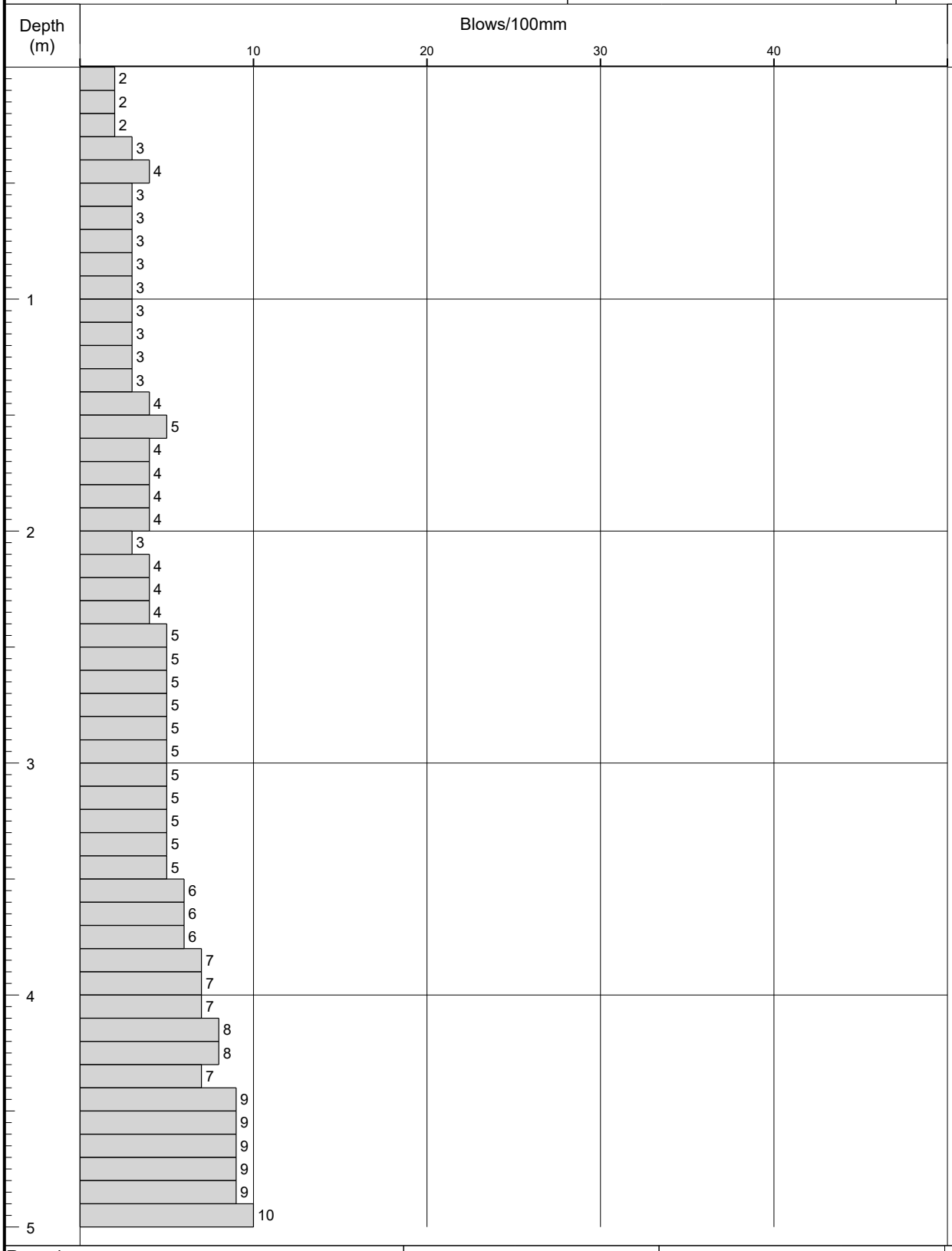
Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 0.50-1.00m bgl.

Probe Log

Borehole No.
DBH205
Sheet 1 of 2

Project Name: Riverpark	Project No. 17-246	Co-ords:	387299.00 - 399484.00	Hole Type DP
Location: Riverpark Trading Estate, Manchester		Level:	55.70	Scale 1:25
Client: Kellen Homes		Dates:	17/01/2024 - 18/01/2024	Logged By L. CALLISS

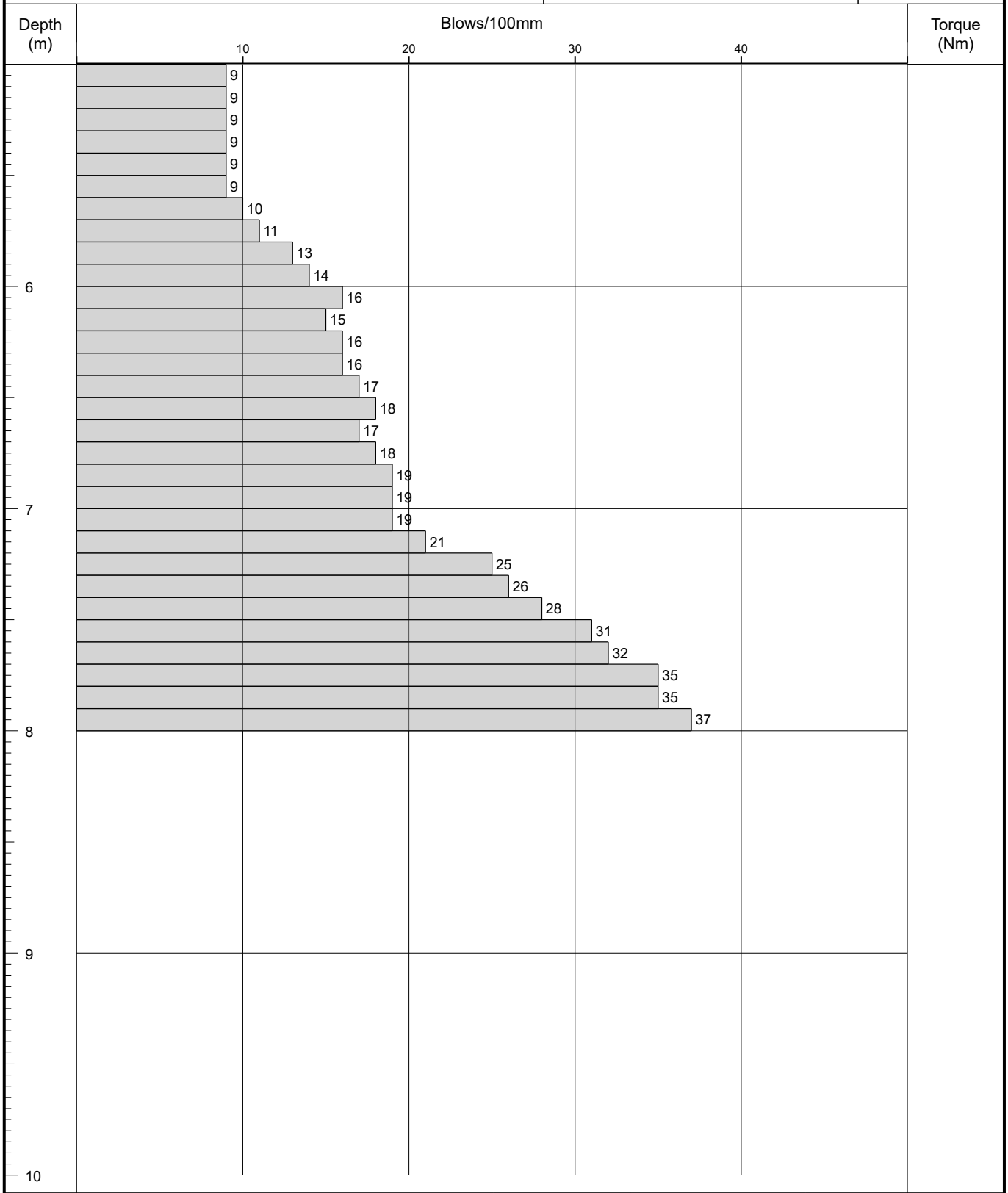


Remarks 1. Complete. 2. Monitoring well installed. 3. Response zone 0.50-1.00m bgl.	Fall Height	Cone Base Diameter	
	Hammer Wt	Final Depth	8.00
	Probe Type	Log Scale	1:25

Probe Log

Borehole No.
DBH205
Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387299.00 - 399484.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 55.70	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Logged By L. CALLISS



Remarks			
1. Complete. 2. Monitoring well installed. 3. Response zone 0.50-1.00m bgl.	Fall Height	Cone Base Diameter	
	Hammer Wt	Final Depth	8.00
	Probe Type	Log Scale	1:25

Borehole Log

Borehole No. **DBH206**

Sheet 1 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387151E - 399504N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	59.50 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	59.50		MADE GROUND: Asphalt.
								MADE GROUND: Black slightly gravelly slightly clayey fine to medium sand. Gravel is fine to medium subangular of sandstone and brick.
					1.80	59.30		Brown slightly sandy CLAY.
					2.90	57.70		Grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
								Grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					10.00	56.60		

1 2 3 4 5 6 7 8 9 10

Remarks

1. Complete.

Borehole Log

Borehole No. **DBH206**

Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387151E - 399504N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	59.50 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					15.00	56.60		End of Borehole at 10.00m

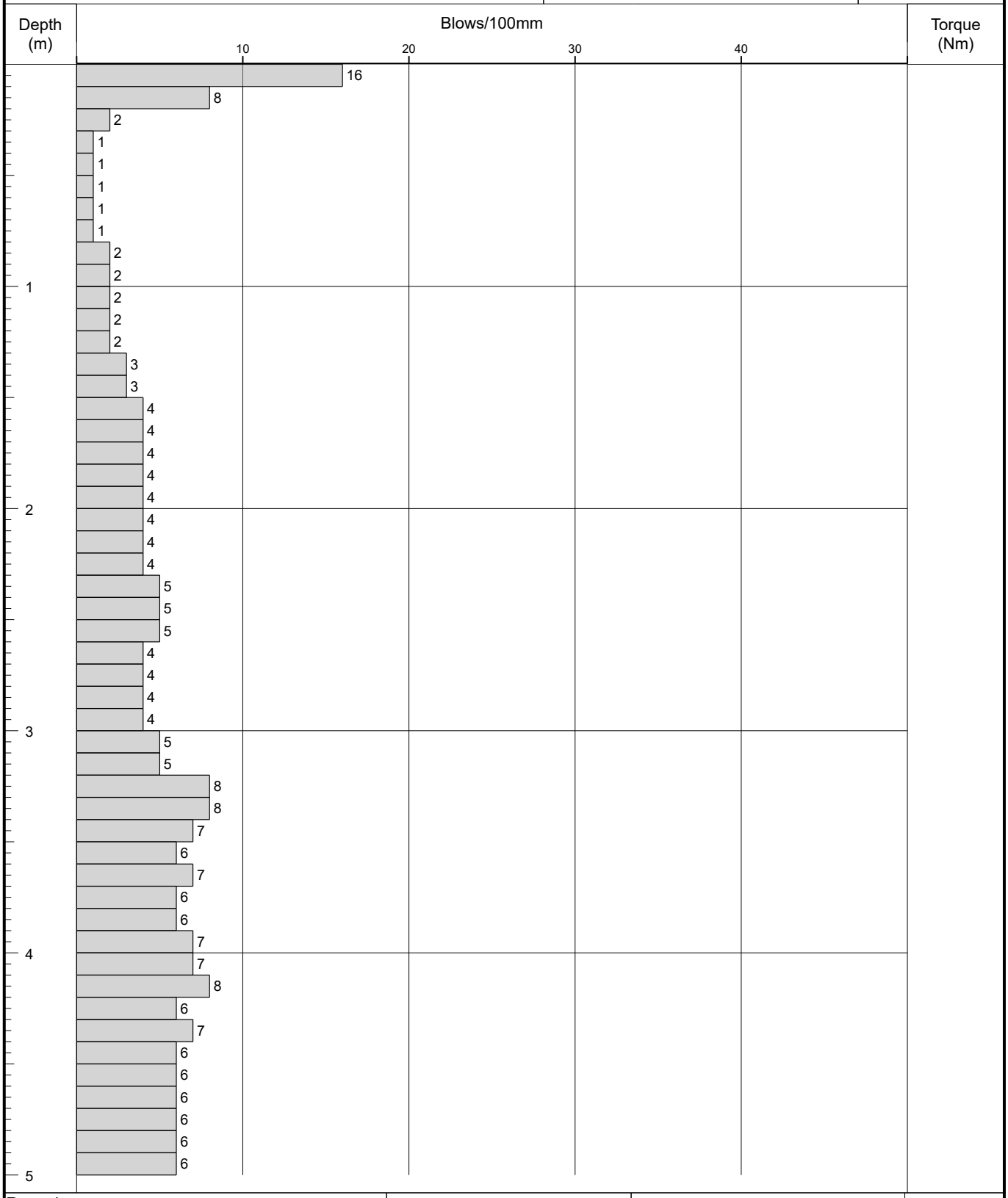
Remarks

1. Complete.

Probe Log

Borehole No.
DBH206
Sheet 1 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387151.00 - 399504.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 59.50	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Logged By L. CALLISS



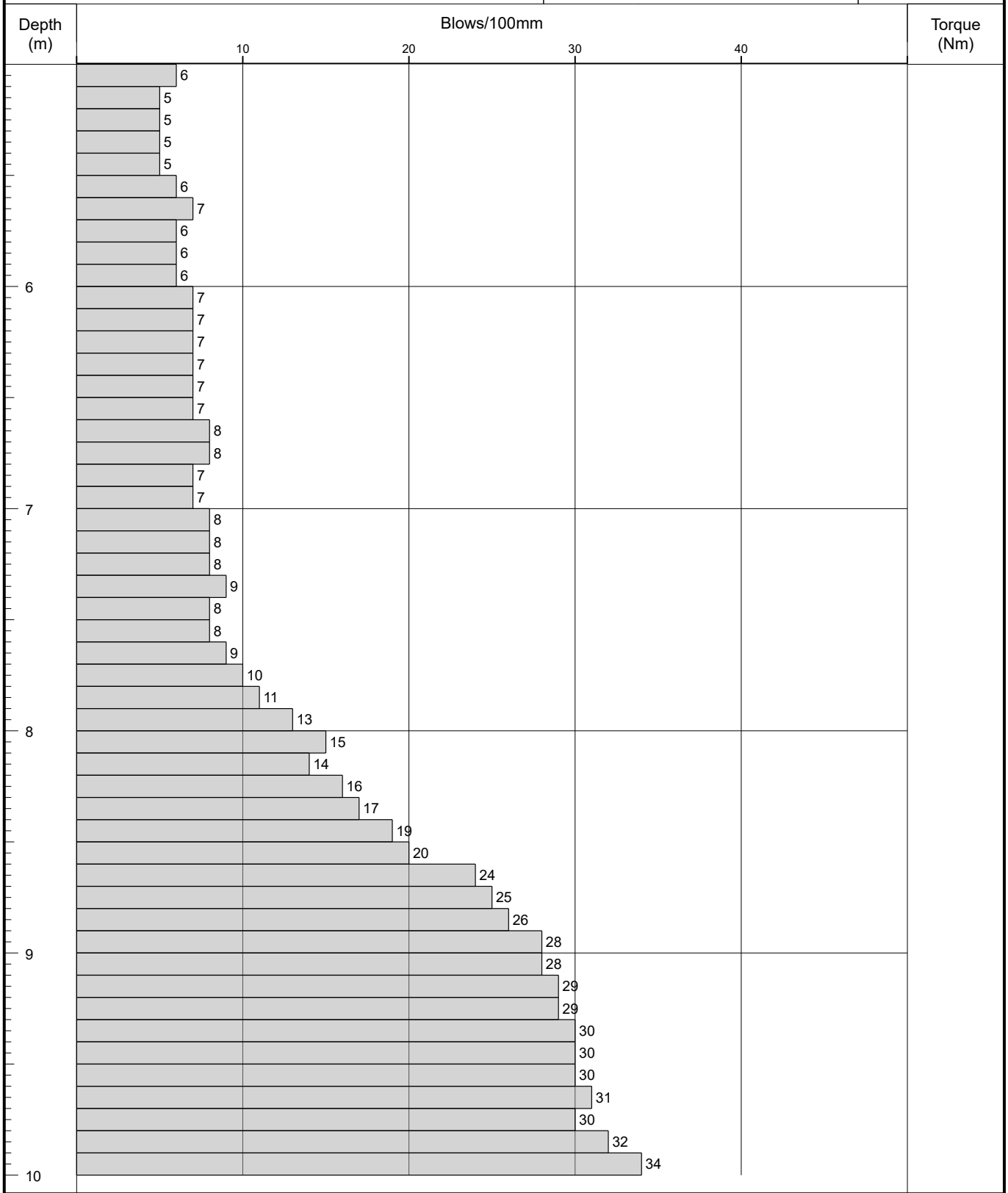
Remarks
1. Complete.

Fall Height		Cone Base Diameter	
Hammer Wt		Final Depth	10.00
Probe Type		Log Scale	1:25

Probe Log

Borehole No.
DBH206
Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387151.00 - 399504.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 59.50	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Logged By L. CALLISS



Remarks
1. Complete.

Fall Height		Cone Base Diameter	
Hammer Wt		Final Depth	10.00
Probe Type		Log Scale	1:25

Borehole Log

Borehole No. **DBH207**

Sheet 1 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387022E - 399470N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	61.70 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	61.70		MADE GROUND: Asphalt.
					0.40	61.50		MADE GROUND: Medium dense yellowish brown sandy gravel. Gravel is fine to medium subangular of sandstone and brick. (MOT subbase).
					0.50	61.30		MADE GROUND: Concrete.
								MADE GROUND: Loose grey slightly sandy gravel. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					2.80	61.20		Stiff high strength brown sandy CLAY.
					4.00	58.90		Very stiff very high strength brown slightly sandy CLAY.
								Very stiff very high strength brown slightly sandy CLAY.

Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 1.00-2.60m bgl.

Borehole Log

Borehole No. **DBH207**

Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387022E - 399470N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	61.70 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	17/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Very stiff very high strength brown slightly sandy CLAY.
					12.00	57.70		End of Borehole at 12.00m
					15.00	57.70		

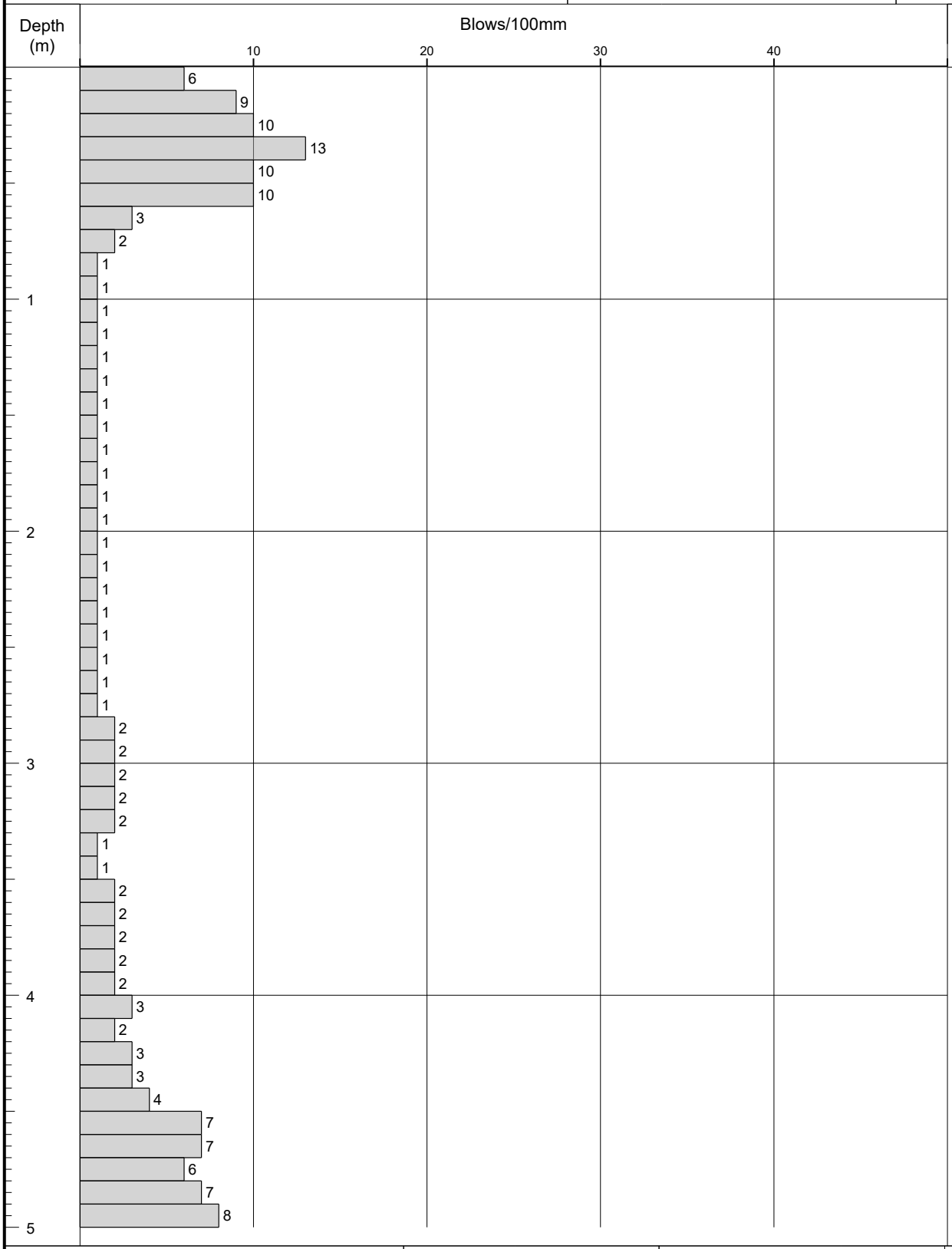
Remarks

1. Complete. 2. Monitoring well installed. 3. Response zone 1.00-2.60m bgl.

Probe Log

Borehole No.
DBH207
Sheet 1 of 3

Project Name: Riverpark	Project No. 17-246	Co-ords:	387022.00 - 399470.00	Hole Type DP
Location: Riverpark Trading Estate, Manchester		Level:	61.70	Scale 1:25
Client: Kellen Homes		Dates:	17/01/2024 - 18/01/2024	Logged By L. CALLISS



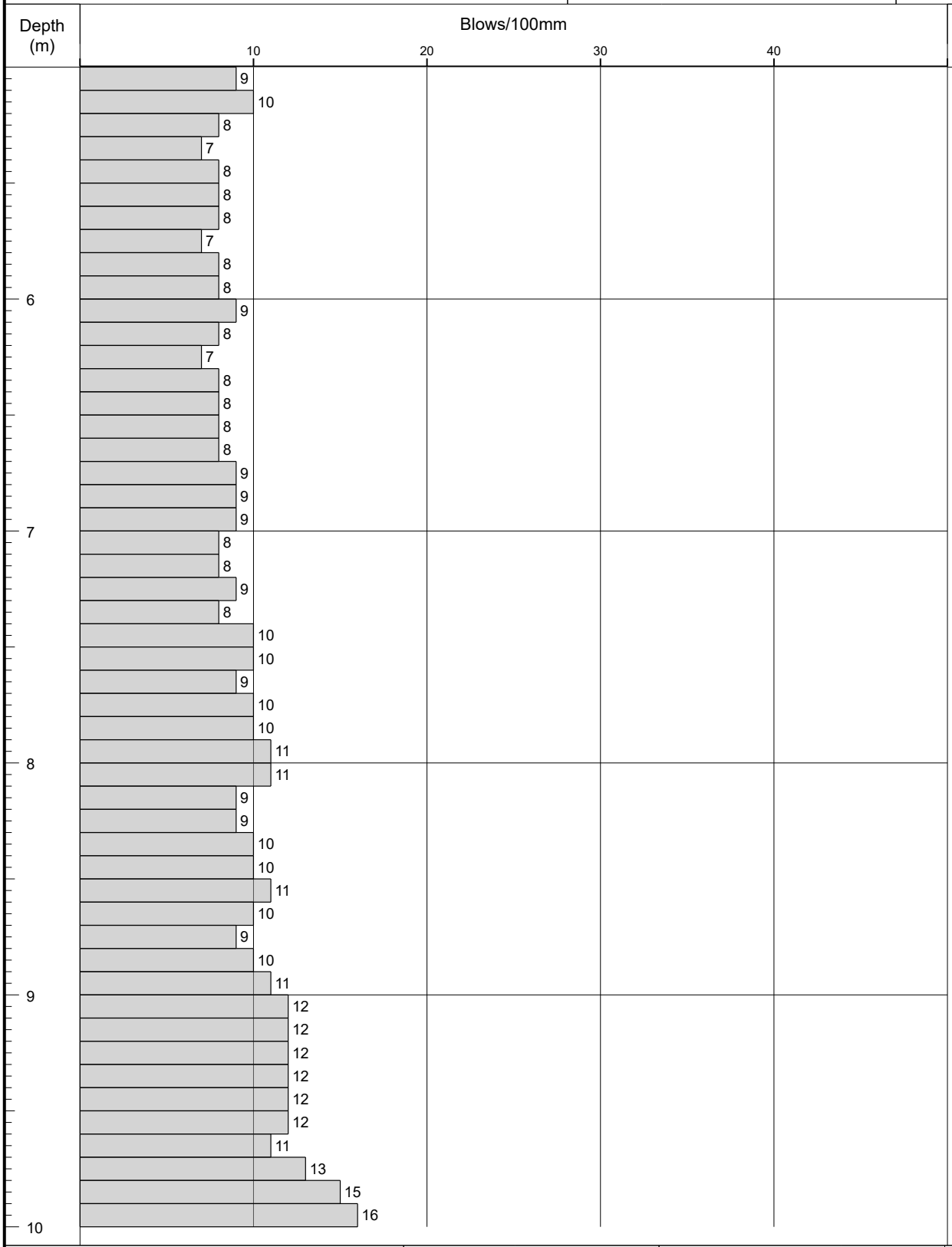
Remarks
1. Complete. 2. Monitoring well installed. 3. Response zone 1.00-2.60m bgl.

Fall Height		Cone Base Diameter	
Hammer Wt		Final Depth	12.00
Probe Type		Log Scale	1:25

Probe Log

Borehole No.
DBH207
Sheet 2 of 3

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387022.00 - 399470.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 61.70	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Logged By L. CALLISS



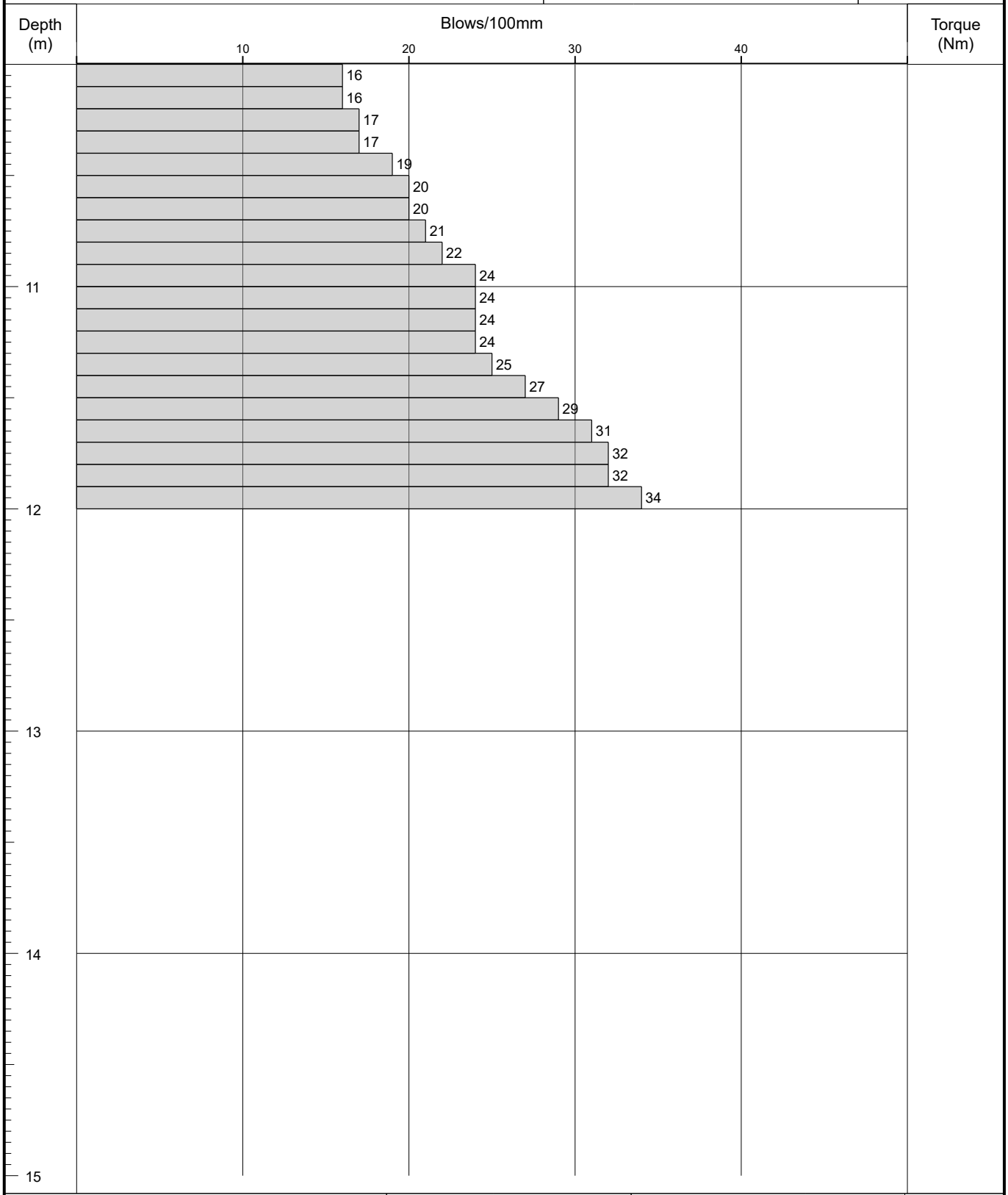
Remarks
1. Complete. 2. Monitoring well installed. 3. Response zone 1.00-2.60m bgl.

Fall Height		Cone Base Diameter	
Hammer Wt		Final Depth	12.00
Probe Type		Log Scale	1:25

Probe Log

Borehole No.
DBH207
Sheet 3 of 3

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387022.00 - 399470.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 61.70	Scale 1:25
Client:	Kellen Homes		Dates: 17/01/2024 - 18/01/2024	Logged By L. CALLISS



Remarks			
1. Complete. 2. Monitoring well installed. 3. Response zone 1.00-2.60m bgl.	Fall Height	Cone Base Diameter	
	Hammer Wt	Final Depth	12.00
	Probe Type	Log Scale	1:25

Borehole Log

			Borehole No.	**DBH208**
				Sheet 1 of 2
Project Name:	Riverpark	Project No. 17-246	Co-ords: 387233E - 399401N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level: 59.40 m AOD	Scale 1:50
Client:	Kellen Homes		Dates: 24/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	59.40		MADE GROUND: Asphalt.
					0.40	59.20		MADE GROUND: Dense yellowish brown sandy gravel. Gravel is fine to medium subangular of sandstone and brick. (MOT subbase).
								MADE GROUND: Loose black fine to medium sand.
					1.00	59.00		MADE GROUND: Very soft very low strength brown sandy CLAY. (Reworked)
					1.50	58.40		Stiff high strength brown sandy CLAY.
					2.50	57.90		Very stiff very high strength grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
								Very stiff very high strength grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					7.00	56.90		End of Borehole at 7.00m

Remarks

1. Complete.

Borehole Log

Borehole No. **DBH208**

Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords:	387233E - 399401N	Hole Type BH
Location:	Riverpark Trading Estate, Manchester		Level:	59.40 m AOD	Scale 1:50
Client:	Kellen Homes		Dates:	24/01/2024	Logged By L. CALLISS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Very stiff very high strength grey slightly sandy gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.
					15.00	56.90		

11 12 13 14 15 16 17 18 19 20

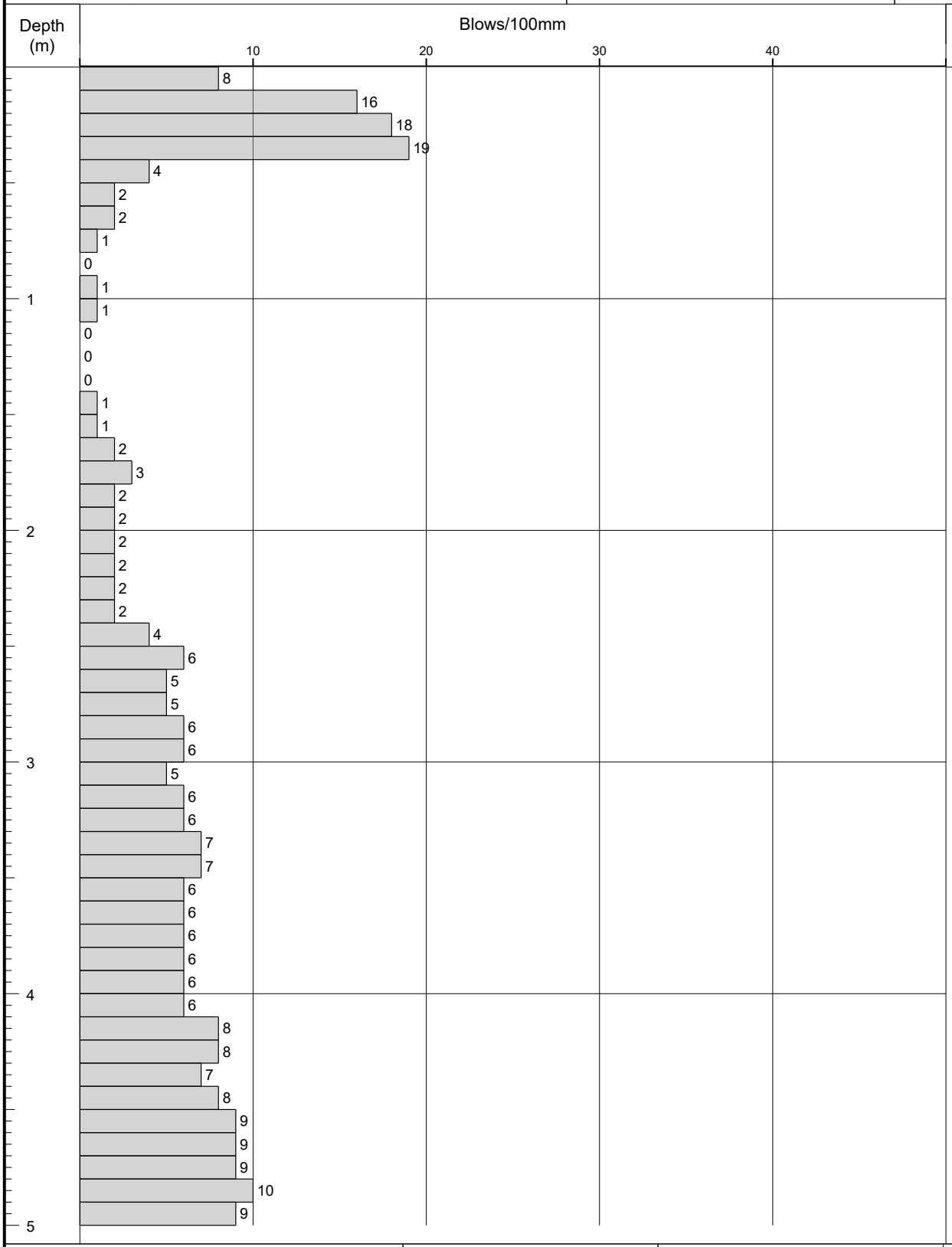
Remarks

1. Complete.

Probe Log

Borehole No.
DBH208
Sheet 1 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387233.00 - 399401.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 59.40	Scale 1:25
Client:	Kellen Homes		Dates: 24/01/2024 - 18/01/2024	Logged By L. CALLISS



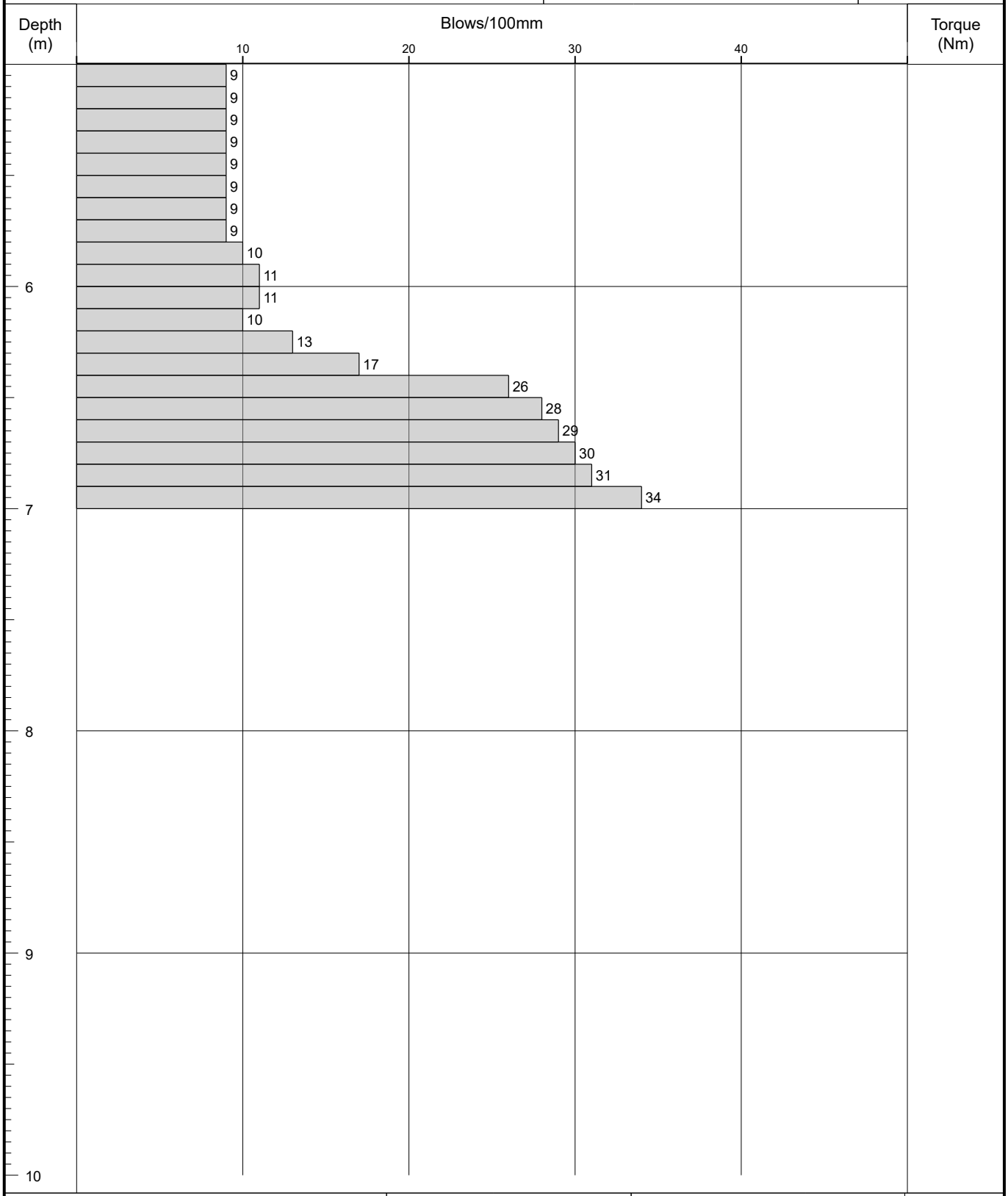
Remarks
1. Complete.

Fall Height		Cone Base Diameter	
Hammer Wt		Final Depth	7.00
Probe Type		Log Scale	1:25

Probe Log

Borehole No.
DBH208
Sheet 2 of 2

Project Name:	Riverpark	Project No. 17-246	Co-ords: 387233.00 - 399401.00	Hole Type DP
Location:	Riverpark Trading Estate, Manchester		Level: 59.40	Scale 1:25
Client:	Kellen Homes		Dates: 24/01/2024 - 18/01/2024	Logged By L. CALLISS



Remarks
1. Complete.

Fall Height		Cone Base Diameter	
Hammer Wt		Final Depth	7.00
Probe Type		Log Scale	1:25

APPENDIX VIII
CHEMICAL TESTING RESULTS

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Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-001862

Project / Site name:	Riverpark	**Samples received on:**	06/02/2024
Your job number:	17 246	**Samples instructed on/ Analysis started on:**	06/02/2024
Your order number:	007350	**Analysis completed by:**	15/02/2024
Report Issue Number:	1	**Report issued on:**	15/02/2024
Samples Analysed:	1 soil sample		

Signed:

Joanna Szwagrzak
Reporting Specialist
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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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

Analytical Report Number: 24-001862
Project / Site name: Riverpark
Your Order No: 007350

Lab Sample Number				111200
Sample Reference				Hardstand 001
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				31/01/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	1.2
Total mass of sample received	kg	0.1	NONE	1
Speciated PAHs				
Naphthalene	mg/kg	0.05	NONE	6.9
Acenaphthylene	mg/kg	0.05	NONE	4.5
Acenaphthene	mg/kg	0.05	NONE	45
Fluorene	mg/kg	0.05	NONE	29
Phenanthrene	mg/kg	0.05	NONE	740
Anthracene	mg/kg	0.05	NONE	210
Fluoranthene	mg/kg	0.05	NONE	920
Pyrene	mg/kg	0.05	NONE	770
Benzo(a)anthracene	mg/kg	0.05	NONE	340
Chrysene	mg/kg	0.05	NONE	290
Benzo(b)fluoranthene	mg/kg	0.05	NONE	340
Benzo(k)fluoranthene	mg/kg	0.05	NONE	130
Benzo(a)pyrene	mg/kg	0.05	NONE	270
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	150
Dibenzo(a,h)anthracene	mg/kg	0.05	NONE	22
Benzo(ghi)perylene	mg/kg	0.05	NONE	160
Total PAH				
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	4410
Miscellaneous Organics				
Coal Tar		N/A	NONE	Not Identified
Total Residue	mg/kg	10	NONE	92000

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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

Analytical Report Number : 24-001862
Project / Site name: Riverpark

* 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 *
111200	Hardstand 001	None Supplied	None Supplied	Black gravel with tar**

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

Analytical Report Number : 24-001862
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	NONE
Coal Tar in soil	In-house method by GC-MS, by calculation of discrete polyaromatic content	In-house method by calculation	L064B	D	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

**Unaccredited sample matrix

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

Sample Deviation Report

Analytical Report Number : 24-001862
Project / Site name: Riverpark

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
Hardstand 001	N/A	S	111200	b	Coal Tar in soil	L064B	b
Hardstand 001	N/A	S	111200	b	Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	L064B	b

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Analytical Report Number : 24-79203

Replaces Analytical Report Number: 24-79203, issue no. 1
Client references/information amended.
All Sample Id's changed as per clients request

Project / Site name:	Riverpark	**Samples received on:**	19/01/2024
Your job number:	17-246	**Samples instructed on/ Analysis started on:**	19/01/2024
Your order number:	7227	**Analysis completed by:**	25/01/2024
Report Issue Number:	2	**Report issued on:**	25/02/2024
Samples Analysed:	3 leachate samples - 14 soil samples		

Signed:

Anna Goc
PL Head of Reporting Team
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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933634	2933635	2933636	2933637	2933638
Sample Reference				TP204	TP211	TP212	TP214	TP215
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.20	1.50	1.10	0.80
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	72	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	8.7	13	10	22
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3	0.3	0.6
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ	N/A	N/A	IZJ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	8.7	8.6	8.6	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	420	370	370	460	560
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.098	0.04	0.043	0.063	0.037
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	200	79	86	130	73
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	97.9	39.6	42.9	62.5	36.6
Sulphide	mg/kg	1	MCERTS	15	14	28	13	1.9
Total Sulphur	mg/kg	50	MCERTS	530	490	670	660	590
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.5	2	0.6	0.5	2.9

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.09	0.18	0.12	0.12	0.57
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.06	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.49
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.4
Phenanthrene	mg/kg	0.05	MCERTS	0.06	0.08	< 0.05	0.06	3.3
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.64
Fluoranthene	mg/kg	0.05	MCERTS	0.07	0.11	< 0.05	< 0.05	3.6
Pyrene	mg/kg	0.05	MCERTS	0.08	0.19	< 0.05	< 0.05	3.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.05	0.06	< 0.05	< 0.05	2
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.19	< 0.05	< 0.05	2.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.17	< 0.05	< 0.05	2
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.08	< 0.05	< 0.05	0.82
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.14	< 0.05	< 0.05	1.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.12	< 0.05	< 0.05	0.89
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.23
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.23	< 0.05	< 0.05	1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	1.61	< 0.80	< 0.80	23.6

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933634	2933635	2933636	2933637	2933638
Sample Reference				TP204	TP211	TP212	TP214	TP215
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.20	1.50	1.10	0.80
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.5	8.2	8.9	8.6	35
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.6	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	49	30	26	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	40	20	17	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	10	49	11	9.8	150
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	85	32	28	37
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	48	79	54	48	120
Petroleum Hydrocarbons								
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	8.7
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	16	< 10	< 10	26
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	450	< 10	< 10	30
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	370	< 10	< 10	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	830	< 10	< 10	67
VOCs								
Chloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	5	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	-	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-
1,1-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Chloroform	µg/kg	5	NONE	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Benzene	µg/kg	5	MCERTS	-	-	-	-	-
Carbontetrachloride	µg/kg	5	NONE	-	-	-	-	-
1,2-dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Trichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Bromodichloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Toluene	µg/kg	5	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	5	ISO 17025	-	-	-	-	-

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933634	2933635	2933636	2933637	2933638
Sample Reference				TP204	TP211	TP212	TP214	TP215
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.20	1.50	1.10	0.80
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Tetrachloroethene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	5	MCERTS	-	-	-	-	-
Styrene	µg/kg	5	ISO 17025	-	-	-	-	-
Bromoform	µg/kg	5	NONE	-	-	-	-	-
o-xylene	µg/kg	5	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromobenzene	µg/kg	5	NONE	-	-	-	-	-
N-Propylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
4-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-

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	ISO 17025	-	-	-	-	-
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	NONE	-	-	-	-	-
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	-	-	-	-	-

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933634	2933635	2933636	2933637	2933638
Sample Reference				TP204	TP211	TP212	TP214	TP215
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.20	1.50	1.10	0.80
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-	-
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	NONE	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	-	-
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	NONE	-	-	-	-	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
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	-	-	-	-	-

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	< 0.007

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933639	2933640	2933641	2933642	2933643
Sample Reference				TP216	TP217	TP203	TP208/SA201	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	0.30	0.50	1.50	1.30
Date Sampled				17/01/2024	17/01/2024	18/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	19	20	15	12	16
Total mass of sample received	kg	0.001	NONE	0.3	0.8	0.3	0.3	0.7
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ	IZJ	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4	8.8	8.9	8.5	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	660	590	540	550	18000
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.09	0.048	0.084	0.23	1.8
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	180	97	170	450	3700
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	89.5	48.3	84.4	226	1830
Sulphide	mg/kg	1	MCERTS	98	140	3	11	1.3
Total Sulphur	mg/kg	50	MCERTS	2500	1000	190	740	8000
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.6	1.3	0.2	0.5	< 0.1

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	0.5	-	0.13	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	0.17	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	0.17	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	0.61	-	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	0.16	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	0.72	-	< 0.05	0.05
Pyrene	mg/kg	0.05	MCERTS	-	0.69	-	< 0.05	0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.32	-	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	0.37	-	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	0.31	-	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	0.15	-	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	0.25	-	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.13	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.24	-	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	4.79	-	< 0.80	< 0.80

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933639	2933640	2933641	2933642	2933643
Sample Reference				TP216	TP217	TP203	TP208/SA201	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	0.30	0.50	1.50	1.30
Date Sampled				17/01/2024	17/01/2024	18/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	23	7.4	10	20
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.5	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	22	13	31	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	34	44	9.6	21	49
Lead (aqua regia extractable)	mg/kg	1	MCERTS	67	37	25	11	54
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	33	10	32	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	69	36	61	53	58
Petroleum Hydrocarbons								
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	5.4	7.5	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	20	17	< 10	< 10	< 10
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	27	130	110	< 10	< 10
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	97	65	< 10	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	53	250	180	< 10	< 10
VOCs								
Chloromethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Chloroethane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Bromomethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Vinyl Chloride	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,1-dichloroethene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,1-dichloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Chloroform	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,2-dichloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Benzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
Carbontetrachloride	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,2-dichloropropane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Trichloroethene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Dibromomethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Toluene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933639	2933640	2933641	2933642	2933643
Sample Reference				TP216	TP217	TP203	TP208/SA201	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	0.30	0.50	1.50	1.30
Date Sampled				17/01/2024	17/01/2024	18/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Tetrachloroethene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
p & m-xylene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
Styrene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Bromoform	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
o-xylene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
Isopropylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Bromobenzene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Tert-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,3-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
P-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,4-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,2-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Butylbenzene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	ISO 17025	< 0.05	-	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	-	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	0.25	-	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933639	2933640	2933641	2933642	2933643
Sample Reference				TP216	TP217	TP203	TP208/SA201	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	0.30	0.50	1.50	1.30
Date Sampled				17/01/2024	17/01/2024	18/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	0.3	-	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	0.18	-	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	0.45	-	< 0.05	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	0.55	-	< 0.05	-	-
Azobenzene	mg/kg	0.3	NONE	< 0.3	-	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	3.2	-	0.09	-	-
Anthracene	mg/kg	0.05	MCERTS	0.84	-	< 0.05	-	-
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
Anthraquinone	mg/kg	0.3	NONE	< 0.3	-	< 0.3	-	-
Fluoranthene	mg/kg	0.05	MCERTS	4.4	-	0.21	-	-
Pyrene	mg/kg	0.05	MCERTS	4.5	-	0.23	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	-	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2	-	0.08	-	-
Chrysene	mg/kg	0.05	MCERTS	2.1	-	0.1	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.3	-	0.11	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.75	-	< 0.05	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.9	-	0.08	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.92	-	0.06	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.31	-	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	-	0.07	-	-

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933644	2933645	2933646	2933647
Sample Reference				WS204	WS208	WS208	WS211
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.80	2.30	0.50
Date Sampled				18/01/2024	17/01/2024	17/01/2024	17/01/2024
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	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	19	12	11
Total mass of sample received	kg	0.001	NONE	0.3	0.8	0.6	0.6
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	N/A	IZJ	N/A	IZJ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	7.8	8.6	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	280	21000	450	430
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.079	1.4	0.21	0.045
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	160	2900	420	89
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	79.1	1430	208	44.7
Sulphide	mg/kg	1	MCERTS	22	9.1	13	12
Total Sulphur	mg/kg	50	MCERTS	560	9100	590	910
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.6	< 0.1	0.5	0.5

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.17	< 0.05	0.11	0.14
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.11	0.1	0.05	0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.05	0.17	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.06	0.19	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.1	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.09	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.13	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.09	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	0.87	< 0.80	< 0.80

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933644	2933645	2933646	2933647
Sample Reference				WS204	WS208	WS208	WS211
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.80	2.30	0.50
Date Sampled				18/01/2024	17/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.5	37	10	11
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	31	31	31
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	63	20	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	88	11	10
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31	32	32	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	64	56	65
Petroleum Hydrocarbons							
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	4	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	20	< 10	< 10	< 10
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	190	< 10	< 10	< 10
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	51	< 10	< 10	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	270	< 10	< 10	< 10
VOCs							
Chloromethane	µg/kg	5	ISO 17025	-	-	-	-
Chloroethane	µg/kg	5	NONE	-	-	-	-
Bromomethane	µg/kg	5	ISO 17025	-	-	-	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	-
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	-
1,1-dichloroethene	µg/kg	5	NONE	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-
1,1-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-
Chloroform	µg/kg	5	NONE	-	-	-	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-
1,2-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-	-	-	-
Benzene	µg/kg	5	MCERTS	-	-	-	-
Carbontetrachloride	µg/kg	5	NONE	-	-	-	-
1,2-dichloropropane	µg/kg	5	ISO 17025	-	-	-	-
Trichloroethene	µg/kg	5	ISO 17025	-	-	-	-
Dibromomethane	µg/kg	5	ISO 17025	-	-	-	-
Bromodichloromethane	µg/kg	5	ISO 17025	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-
Toluene	µg/kg	5	MCERTS	-	-	-	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-
Dibromochloromethane	µg/kg	5	ISO 17025	-	-	-	-

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933644	2933645	2933646	2933647
Sample Reference				WS204	WS208	WS208	WS211
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.80	2.30	0.50
Date Sampled				18/01/2024	17/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Tetrachloroethene	µg/kg	5	NONE	-	-	-	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	-	-	-	-
Chlorobenzene	µg/kg	5	ISO 17025	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-
p & m-xylene	µg/kg	5	MCERTS	-	-	-	-
Styrene	µg/kg	5	ISO 17025	-	-	-	-
Bromoform	µg/kg	5	NONE	-	-	-	-
o-xylene	µg/kg	5	MCERTS	-	-	-	-
Isopropylbenzene	µg/kg	5	ISO 17025	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-
Bromobenzene	µg/kg	5	NONE	-	-	-	-
N-Propylbenzene	µg/kg	5	ISO 17025	-	-	-	-
2-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-
4-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-
Tert-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-
Sec-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-
1,3-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-
P-Isopropyltoluene	µg/kg	5	ISO 17025	-	-	-	-
1,4-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-
1,2-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-
Butylbenzene	µg/kg	5	NONE	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-

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	ISO 17025	-	-	-	-
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	NONE	-	-	-	-
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	-	-	-	-

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Analytical Report Number: 24-79203
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933644	2933645	2933646	2933647
Sample Reference				WS204	WS208	WS208	WS211
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.80	2.30	0.50
Date Sampled				18/01/2024	17/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-
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	NONE	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	-
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	NONE	-	-	-	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-
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	-	-	-	-

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-79203
Project / Site name: Riverpark

Your Order No: 7227

Lab Sample Number				2933648	2933649	2933650
Sample Reference				TP217	WS204	WS208
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.80
Date Sampled				17/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
General Inorganics						
pH (automated)	pH Units	N/A	ISO 17025	8	10.5	7.8
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	1.2	1.6
Total Phenols						
Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Speciated PAHs						
Naphthalene	µg/l	0.01	NONE	< 0.01	0.66	< 0.01
Acenaphthylene	µg/l	0.01	NONE	< 0.01	0.27	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	NONE	< 0.01	0.2	< 0.01
Phenanthrene	µg/l	0.01	NONE	< 0.01	0.32	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Total PAH						
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	1.5	< 0.2
Heavy Metals / Metalloids						
Arsenic (dissolved)	µg/l	1	ISO 17025	11	15	4.2
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	19	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1	30	0.6
Copper (dissolved)	µg/l	0.7	ISO 17025	7.4	30	43
Lead (dissolved)	µg/l	1	ISO 17025	3.6	10	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.1	0.7	5.1
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.9	8.1	16
Monoaromatics & Oxygenates						
Benzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10

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Analytical Report Number: 24-79203
Project / Site name: Riverpark

Your Order No: 7227

Lab Sample Number				2933648	2933649	2933650
Sample Reference				TP217	WS204	WS208
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.80
Date Sampled				17/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Petroleum Hydrocarbons						
TPH1 (C10 - C40) EH_1D_TOTAL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 24-79203
Project / Site name: Riverpark

* 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 *
2933634	TP204	None Supplied	1.3	Brown clay with gravel.
2933635	TP211	None Supplied	0.2	Brown sand with stones.
2933636	TP212	None Supplied	1.5	Brown clay.
2933637	TP214	None Supplied	1.1	Brown clay.
2933638	TP215	None Supplied	0.8	Brown loam and gravel.
2933639	TP216	None Supplied	2	Brown clay and loam with gravel.
2933640	TP217	None Supplied	0.3	Brown loam and gravel with brick.
2933641	TP203	None Supplied	0.5	Brown sand with brick.
2933642	TP208/SA201	None Supplied	1.5	Brown clay.
2933643	WS202	None Supplied	1.3	Brown sandy clay with gravel.
2933644	WS204	None Supplied	1.8	Brown clay with gravel.
2933645	WS208	None Supplied	0.8	Brown sandy clay with gravel.
2933646	WS208	None Supplied	2.3	Brown clay with gravel.
2933647	WS211	None Supplied	0.5	Brown clay with gravel.

Analytical Report Number : 24-79203
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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.	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
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
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 24-79203
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-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.Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total 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.	L009-PL	D	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
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Analytical Report Number : 24-79203
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 24-79349

Replaces Analytical Report Number: 24-79349, issue no. 1
Client references/information amended.
All Sample Id's changed as per clients request

Project / Site name:	Riverpark	**Samples received on:**	22/01/2024
Your job number:	17-246	**Samples instructed on/ Analysis started on:**	22/01/2024
Your order number:	7227	**Analysis completed by:**	29/01/2024
Report Issue Number:	2	**Report issued on:**	25/02/2024
Samples Analysed:	1 leachate sample - 7 soil samples		

Signed:

Anna Goc
PL Head of Reporting Team
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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 24-79349
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934428	2934429	2934430	2934431	2934432
Sample Reference				TP/SA203	TP/SA203	TP205	TP207	TP209
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.50	0.90	0.20
Date Sampled				19/01/2024	19/01/2024	19/01/2024	19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	13	10	10	5
Total mass of sample received	kg	0.001	NONE	0.8	0.3	0.2	0.2	0.3
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite- Loose Fibres	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DBU	N/A	DBU	N/A	DBU
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.9	8.5	9.5	8.6	8.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	2700	370	930	410	180
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.015	0.065	0.13	0.075	0.014
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	29	130	250	150	27
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	14.5	65.1	126	74.5	13.5
Sulphide	mg/kg	1	MCERTS	11	11	44	17	2.2
Total Sulphur	mg/kg	50	MCERTS	1100	1500	770	810	260
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.9	0.6	1.9	0.7	5.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.16	< 0.05	0.11	< 0.05	0.73
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.08	< 0.05	0.21
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.09	< 0.05	0.35
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.34
Phenanthrene	mg/kg	0.05	MCERTS	0.15	< 0.05	0.64	< 0.05	0.43
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.13	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.17	< 0.05	0.65	< 0.05	0.1
Pyrene	mg/kg	0.05	MCERTS	0.16	< 0.05	0.7	< 0.05	0.16
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.09	< 0.05	0.34	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.1	< 0.05	0.47	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.11	< 0.05	0.36	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	0.12	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.07	< 0.05	0.24	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.16	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.28	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.01	< 0.80	4.37	< 0.80	2.32

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Analytical Report Number: 24-79349
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934428	2934429	2934430	2934431	2934432
Sample Reference				TP/SA203	TP/SA203	TP205	TP207	TP209
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.50	0.90	0.20
Date Sampled				19/01/2024	19/01/2024	19/01/2024	19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.7	9.8	12	7.4	3.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	1.2	< 0.2	0.3
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	28	22	21	10
Copper (aqua regia extractable)	mg/kg	1	MCERTS	40	21	39	18	7.7
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	11	140	22	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	32	26	24	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	32	51	140	48	23
Petroleum Hydrocarbons								
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	3.2	< 2.0	2.4
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	< 4.0	< 4.0	75	< 4.0	14
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10	220	< 10	91
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	21	< 10	720	< 10	1300
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	< 10	470	< 10	830
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	31	< 10	1500	< 10	2300

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-79349
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934433	2934434
Sample Reference				TP209	TP218
Sample Number				None Supplied	None Supplied
Depth (m)				1.30	1.40
Date Sampled				19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	9.9
Total mass of sample received	kg	0.001	NONE	0.2	0.3
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A
General Inorganics					
pH - Automated	pH Units	N/A	MCERTS	8.1	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	440	250
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.08	0.029
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	160	57
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	79.8	28.7
Sulphide	mg/kg	1	MCERTS	11	< 1.0
Total Sulphur	mg/kg	50	MCERTS	570	370
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.6	0.5
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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	ISO 17025	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 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	ISO 17025	< 0.80	< 0.80

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Analytical Report Number: 24-79349
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934433	2934434
Sample Reference				TP209	TP218
Sample Number				None Supplied	None Supplied
Depth (m)				1.30	1.40
Date Sampled				19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	6.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	7.8
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	40
Petroleum Hydrocarbons					
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	< 4.0	< 4.0
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	< 10

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Analytical Report Number: 24-79349
Project / Site name: Riverpark

Your Order No: 7227

Lab Sample Number				2934435
Sample Reference				TP/SA203
Sample Number				None Supplied
Depth (m)				0.30
Date Sampled				19/01/2024
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (automated)	pH Units	N/A	ISO 17025	11.4
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0
Total Phenols				
Total Phenols (monohydric)	µg/l	1	ISO 17025	1.2
Speciated PAHs				
Naphthalene	µg/l	0.01	NONE	< 0.01
Acenaphthylene	µg/l	0.01	NONE	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01
Fluorene	µg/l	0.01	NONE	< 0.01
Phenanthrene	µg/l	0.01	NONE	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01
Total PAH				
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2
Heavy Metals / Metalloids				
Arsenic (dissolved)	µg/l	1	ISO 17025	3.8
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	5.7
Copper (dissolved)	µg/l	0.7	ISO 17025	69
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.5
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.3
Monoaromatics & Oxygenates				
Benzene	µg/l	3	NONE	< 3.0
Toluene	µg/l	3	NONE	< 3.0
Ethylbenzene	µg/l	3	NONE	< 3.0
p & m-xylene	µg/l	3	NONE	< 3.0
o-xylene	µg/l	3	NONE	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10

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Analytical Report Number: 24-79349
Project / Site name: Riverpark

Your Order No: 7227

Lab Sample Number				2934435
Sample Reference				TP/SA203
Sample Number				None Supplied
Depth (m)				0.30
Date Sampled				19/01/2024
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Petroleum Hydrocarbons				
TPH1 (C10 - C40) EH_1D_TOTAL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	NONE	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	NONE	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	NONE	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	NONE	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	NONE	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	NONE	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_1D_AR_MS	µg/l	10	NONE	< 10

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Analytical Report Number : 24-79349
Project / Site name: Riverpark

* 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 *
2934428	TP/SA203	None Supplied	0.3	Brown sand with gravel.
2934429	TP/SA203	None Supplied	0.6	Brown clay and sand with gravel.
2934430	TP205	None Supplied	0.5	Brown sand with gravel and brick.
2934431	TP207	None Supplied	0.9	Brown clay and sand with gravel.
2934432	TP209	None Supplied	0.2	Black sand with gravel and tar.
2934433	TP209	None Supplied	1.3	Brown clay and sand.
2934434	TP218	None Supplied	1.4	Brown clay and sand with gravel.

Analytical Report Number : 24-79349
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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.	L038-PL	D	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
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
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
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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

Analytical Report Number : 24-79349
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total 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.	L009-PL	D	MCERTS
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics

Analytical Report Number : 24-79349
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
AR	Aromatics				
#1	EH_2D_Total but with humics mathematically subtracted				
#2	EH_2D_Total but with fatty acids mathematically subtracted				
_	Operator - understore to separate acronyms (exception for +)				
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total				

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Combined Report - Riverpark

Reports 24-79349 & 24-79203 combined as per clients request

Project / Site name:	Riverpark	**Samples received on:**	19/01/2024
Your job number:	17-246	**Samples instructed on/ Analysis started on:**	19/01/2024
Your order number:	7227	**Analysis completed by:**	25/01/2024
Report Issue Number:	1	**Report issued on:**	25/02/2024
Samples Analysed:	4 leachate samples - 21 soil samples		

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing.

Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933634	2933635	2933636	2933637	2933638
Sample Reference				TP204	TP211	TP212	TP214	TP215
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.20	1.50	1.10	0.80
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	72	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	8.7	13	10	22
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3	0.3	0.6
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 Analyst ID	N/A	N/A	N/A	IZJ	IZJ	N/A	N/A	IZJ
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.6	8.7	8.6	8.6	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	420	370	370	460	560
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.098	0.04	0.043	0.063	0.037
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	200	79	86	130	73
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	97.9	39.6	42.9	62.5	36.6
Sulphide	mg/kg	1	MCERTS	15	14	28	13	1.9
Total Sulphur	mg/kg	50	MCERTS	530	490	670	660	590
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.5	2	0.6	0.5	2.9
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.09	0.18	0.12	0.12	0.57
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.06	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.49
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.4
Phenanthrene	mg/kg	0.05	MCERTS	0.06	0.08	< 0.05	0.06	3.3
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.64
Fluoranthene	mg/kg	0.05	MCERTS	0.07	0.11	< 0.05	< 0.05	3.6
Pyrene	mg/kg	0.05	MCERTS	0.08	0.19	< 0.05	< 0.05	3.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.05	0.06	< 0.05	< 0.05	2
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.19	< 0.05	< 0.05	2.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.17	< 0.05	< 0.05	2
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.08	< 0.05	< 0.05	0.82
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.14	< 0.05	< 0.05	1.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.12	< 0.05	< 0.05	0.89
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.23
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.23	< 0.05	< 0.05	1
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	1.61	< 0.80	< 0.80	23.6

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933634	2933635	2933636	2933637	2933638
Sample Reference				TP204	TP211	TP212	TP214	TP215
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.20	1.50	1.10	0.80
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.5	8.2	8.9	8.6	35
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.6	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	49	30	26	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	40	20	17	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	10	49	11	9.8	150
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	85	32	28	37
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	48	79	54	48	120
Petroleum Hydrocarbons								
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	8.7
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	16	< 10	< 10	26
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	450	< 10	< 10	30
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	370	< 10	< 10	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	830	< 10	< 10	67
VOCs								
Chloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	5	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	-	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-
1,1-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Chloroform	µg/kg	5	NONE	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Benzene	µg/kg	5	MCERTS	-	-	-	-	-
Carbontetrachloride	µg/kg	5	NONE	-	-	-	-	-
1,2-dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Trichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Bromodichloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Toluene	µg/kg	5	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	5	ISO 17025	-	-	-	-	-

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933634	2933635	2933636	2933637	2933638
Sample Reference				TP204	TP211	TP212	TP214	TP215
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.20	1.50	1.10	0.80
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Tetrachloroethene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	5	MCERTS	-	-	-	-	-
Styrene	µg/kg	5	ISO 17025	-	-	-	-	-
Bromoform	µg/kg	5	NONE	-	-	-	-	-
o-xylene	µg/kg	5	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromobenzene	µg/kg	5	NONE	-	-	-	-	-
N-Propylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
4-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-

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	ISO 17025	-	-	-	-	-
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	NONE	-	-	-	-	-
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	-	-	-	-	-

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933634	2933635	2933636	2933637	2933638
Sample Reference				TP204	TP211	TP212	TP214	TP215
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.20	1.50	1.10	0.80
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-	-
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	NONE	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	-	-
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	NONE	-	-	-	-	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
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	-	-	-	-	-

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	< 0.007

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933639	2933640	2933641	2933642	2933643
Sample Reference				TP216	TP217	TP203	TP208/SA201	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	0.30	0.50	1.50	1.30
Date Sampled				17/01/2024	17/01/2024	18/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	19	20	15	12	16
Total mass of sample received	kg	0.001	NONE	0.3	0.8	0.3	0.3	0.7
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 Analyst ID	N/A	N/A	N/A	IZJ	IZJ	IZJ	N/A	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	8.8	8.9	8.5	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	660	590	540	550	18000
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.09	0.048	0.084	0.23	1.8
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	180	97	170	450	3700
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	89.5	48.3	84.4	226	1830
Sulphide	mg/kg	1	MCERTS	98	140	3	11	1.3
Total Sulphur	mg/kg	50	MCERTS	2500	1000	190	740	8000
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.6	1.3	0.2	0.5	< 0.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	0.5	-	0.13	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	0.17	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	0.17	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	0.61	-	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	0.16	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	0.72	-	< 0.05	0.05
Pyrene	mg/kg	0.05	MCERTS	-	0.69	-	< 0.05	0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.32	-	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	0.37	-	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	0.31	-	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	0.15	-	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	0.25	-	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.13	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.24	-	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	4.79	-	< 0.80	< 0.80

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933639	2933640	2933641	2933642	2933643
Sample Reference				TP216	TP217	TP203	TP208/SA201	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	0.30	0.50	1.50	1.30
Date Sampled				17/01/2024	17/01/2024	18/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	23	7.4	10	20
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.5	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	22	13	31	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	34	44	9.6	21	49
Lead (aqua regia extractable)	mg/kg	1	MCERTS	67	37	25	11	54
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	33	10	32	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	69	36	61	53	58
Petroleum Hydrocarbons								
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	5.4	7.5	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	20	17	< 10	< 10	< 10
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	27	130	110	< 10	< 10
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	97	65	< 10	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	53	250	180	< 10	< 10
VOCs								
Chloromethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Chloroethane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Bromomethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Vinyl Chloride	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,1-dichloroethene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,1-dichloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Chloroform	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,2-dichloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Benzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
Carbontetrachloride	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,2-dichloropropane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Trichloroethene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Dibromomethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Toluene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933639	2933640	2933641	2933642	2933643
Sample Reference				TP216	TP217	TP203	TP208/SA201	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	0.30	0.50	1.50	1.30
Date Sampled				17/01/2024	17/01/2024	18/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Tetrachloroethene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
p & m-xylene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
Styrene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Bromoform	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
o-xylene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	-
Isopropylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
Bromobenzene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Tert-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,3-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
P-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,4-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,2-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Butylbenzene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	-

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	ISO 17025	< 0.05	-	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	-	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	0.25	-	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933639	2933640	2933641	2933642	2933643
Sample Reference				TP216	TP217	TP203	TP208/SA201	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	0.30	0.50	1.50	1.30
Date Sampled				17/01/2024	17/01/2024	18/01/2024	17/01/2024	17/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	0.3	-	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	0.18	-	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	0.45	-	< 0.05	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	0.55	-	< 0.05	-	-
Azobenzene	mg/kg	0.3	NONE	< 0.3	-	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	3.2	-	0.09	-	-
Anthracene	mg/kg	0.05	MCERTS	0.84	-	< 0.05	-	-
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	-
Anthraquinone	mg/kg	0.3	NONE	< 0.3	-	< 0.3	-	-
Fluoranthene	mg/kg	0.05	MCERTS	4.4	-	0.21	-	-
Pyrene	mg/kg	0.05	MCERTS	4.5	-	0.23	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	-	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2	-	0.08	-	-
Chrysene	mg/kg	0.05	MCERTS	2.1	-	0.1	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.3	-	0.11	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.75	-	< 0.05	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.9	-	0.08	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.92	-	0.06	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.31	-	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	-	0.07	-	-

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933644	2933645	2933646	2933647	2934428
Sample Reference				WS204	WS208	WS208	WS211	TP/SA203
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.80	2.30	0.50	0.30
Date Sampled				18/01/2024	17/01/2024	17/01/2024	17/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	19	12	11	12
Total mass of sample received	kg	0.001	NONE	0.3	0.8	0.6	0.6	0.8
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 Analyst ID	N/A	N/A	N/A	N/A	IZJ	N/A	IZJ	DBU
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	7.8	8.6	8.7	11.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	280	21000	450	430	2700
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.079	1.4	0.21	0.045	0.015
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	160	2900	420	89	29
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	79.1	1430	208	44.7	14.5
Sulphide	mg/kg	1	MCERTS	22	9.1	13	12	11
Total Sulphur	mg/kg	50	MCERTS	560	9100	590	910	1100
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.6	< 0.1	0.5	0.5	0.9
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.17	< 0.05	0.11	0.14	0.16
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.11	0.1	0.05	0.05	0.15
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.05	0.17	< 0.05	< 0.05	0.17
Pyrene	mg/kg	0.05	MCERTS	0.06	0.19	< 0.05	< 0.05	0.16
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.1	< 0.05	< 0.05	0.09
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.09	< 0.05	< 0.05	0.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.13	< 0.05	< 0.05	0.11
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.09	< 0.05	< 0.05	0.07
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	0.87	< 0.80	< 0.80	1.01

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933644	2933645	2933646	2933647	2934428
Sample Reference				WS204	WS208	WS208	WS211	TP/SA203
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.80	2.30	0.50	0.30
Date Sampled				18/01/2024	17/01/2024	17/01/2024	17/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.5	37	10	11	7.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	31	31	31	13
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	63	20	20	40
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	88	11	10	25
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31	32	32	32	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	64	56	65	32
Petroleum Hydrocarbons								
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	4	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	20	< 10	< 10	< 10	< 10
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	190	< 10	< 10	< 10	21
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	51	< 10	< 10	< 10	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	270	< 10	< 10	< 10	31
VOCs								
Chloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	5	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	-	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-
1,1-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Chloroform	µg/kg	5	NONE	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Benzene	µg/kg	5	MCERTS	-	-	-	-	-
Carbontetrachloride	µg/kg	5	NONE	-	-	-	-	-
1,2-dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Trichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Bromodichloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Toluene	µg/kg	5	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	5	ISO 17025	-	-	-	-	-

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933644	2933645	2933646	2933647	2934428
Sample Reference				WS204	WS208	WS208	WS211	TP/SA203
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.80	2.30	0.50	0.30
Date Sampled				18/01/2024	17/01/2024	17/01/2024	17/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Tetrachloroethene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	5	MCERTS	-	-	-	-	-
Styrene	µg/kg	5	ISO 17025	-	-	-	-	-
Bromoform	µg/kg	5	NONE	-	-	-	-	-
o-xylene	µg/kg	5	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromobenzene	µg/kg	5	NONE	-	-	-	-	-
N-Propylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
4-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-

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	ISO 17025	-	-	-	-	-
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	NONE	-	-	-	-	-
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	-	-	-	-	-

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2933644	2933645	2933646	2933647	2934428
Sample Reference				WS204	WS208	WS208	WS211	TP/SA203
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.80	2.30	0.50	0.30
Date Sampled				18/01/2024	17/01/2024	17/01/2024	17/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-	-
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	NONE	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	-	-
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	NONE	-	-	-	-	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
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	-	-	-	-	-

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934429	2934430	2934431	2934432	2934433
Sample Reference				TP/SA203	TP205	TP207	TP209	TP209
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.50	0.90	0.20	1.30
Date Sampled				19/01/2024	19/01/2024	19/01/2024	19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	10	10	5	13
Total mass of sample received	kg	0.001	NONE	0.3	0.2	0.2	0.3	0.2
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Amosite- Loose Fibres	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Detected	-	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	DBU	N/A	DBU	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	9.5	8.6	8.8	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	370	930	410	180	440
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.065	0.13	0.075	0.014	0.08
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	130	250	150	27	160
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	65.1	126	74.5	13.5	79.8
Sulphide	mg/kg	1	MCERTS	11	44	17	2.2	11
Total Sulphur	mg/kg	50	MCERTS	1500	770	810	260	570
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.6	1.9	0.7	5.1	0.6
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.11	< 0.05	0.73	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.08	< 0.05	0.21	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.09	< 0.05	0.35	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.34	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.64	< 0.05	0.43	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.13	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.65	< 0.05	0.1	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.7	< 0.05	0.16	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.34	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.47	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.36	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.12	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.24	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.16	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.28	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	4.37	< 0.80	2.32	< 0.80

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934429	2934430	2934431	2934432	2934433
Sample Reference				TP/SA203	TP205	TP207	TP209	TP209
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.50	0.90	0.20	1.30
Date Sampled				19/01/2024	19/01/2024	19/01/2024	19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.8	12	7.4	3.3	11
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	1.2	< 0.2	0.3	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	22	21	10	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	39	18	7.7	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	140	22	16	11
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32	26	24	13	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51	140	48	23	54
Petroleum Hydrocarbons								
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	3.2	< 2.0	2.4	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	< 4.0	75	< 4.0	14	< 4.0
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	220	< 10	91	< 10
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	720	< 10	1300	< 10
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	470	< 10	830	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	1500	< 10	2300	< 10
VOCs								
Chloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	5	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	-	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-
1,1-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Chloroform	µg/kg	5	NONE	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Benzene	µg/kg	5	MCERTS	-	-	-	-	-
Carbontetrachloride	µg/kg	5	NONE	-	-	-	-	-
1,2-dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Trichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Bromodichloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Toluene	µg/kg	5	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	5	ISO 17025	-	-	-	-	-

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934429	2934430	2934431	2934432	2934433
Sample Reference				TP/SA203	TP205	TP207	TP209	TP209
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.50	0.90	0.20	1.30
Date Sampled				19/01/2024	19/01/2024	19/01/2024	19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Tetrachloroethene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	5	MCERTS	-	-	-	-	-
Styrene	µg/kg	5	ISO 17025	-	-	-	-	-
Bromoform	µg/kg	5	NONE	-	-	-	-	-
o-xylene	µg/kg	5	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromobenzene	µg/kg	5	NONE	-	-	-	-	-
N-Propylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
4-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-

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	ISO 17025	-	-	-	-	-
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	NONE	-	-	-	-	-
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	-	-	-	-	-

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934429	2934430	2934431	2934432	2934433
Sample Reference				TP/SA203	TP205	TP207	TP209	TP209
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.50	0.90	0.20	1.30
Date Sampled				19/01/2024	19/01/2024	19/01/2024	19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-	-
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	NONE	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	-	-
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	NONE	-	-	-	-	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
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	-	-	-	-	-

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934434
Sample Reference				TP218
Sample Number				None Supplied
Depth (m)				1.40
Date Sampled				19/01/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	9.9
Total mass of sample received	kg	0.001	NONE	0.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-
Asbestos in Soil	Type	N/A	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	250
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.029
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	57
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	28.7
Sulphide	mg/kg	1	MCERTS	< 1.0
Total Sulphur	mg/kg	50	MCERTS	370
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.5

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 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	ISO 17025	< 0.80

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934434
Sample Reference				TP218
Sample Number				None Supplied
Depth (m)				1.40
Date Sampled				19/01/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	7.8
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40
Petroleum Hydrocarbons				
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	< 4.0
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	< 10
VOCs				
Chloromethane	µg/kg	5	ISO 17025	-
Chloroethane	µg/kg	5	NONE	-
Bromomethane	µg/kg	5	ISO 17025	-
Vinyl Chloride	µg/kg	5	NONE	-
Trichlorofluoromethane	µg/kg	5	NONE	-
1,1-dichloroethene	µg/kg	5	NONE	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-
1,1-dichloroethane	µg/kg	5	ISO 17025	-
2,2-Dichloropropane	µg/kg	5	NONE	-
Chloroform	µg/kg	5	NONE	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-
1,2-dichloroethane	µg/kg	5	ISO 17025	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-
Benzene	µg/kg	5	MCERTS	-
Carbontetrachloride	µg/kg	5	NONE	-
1,2-dichloropropane	µg/kg	5	ISO 17025	-
Trichloroethene	µg/kg	5	ISO 17025	-
Dibromomethane	µg/kg	5	ISO 17025	-
Bromodichloromethane	µg/kg	5	ISO 17025	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-
Toluene	µg/kg	5	MCERTS	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	-
Dibromochloromethane	µg/kg	5	ISO 17025	-

Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934434
Sample Reference				TP218
Sample Number				None Supplied
Depth (m)				1.40
Date Sampled				19/01/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Tetrachloroethene	µg/kg	5	NONE	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	-
Chlorobenzene	µg/kg	5	ISO 17025	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-
Ethylbenzene	µg/kg	5	MCERTS	-
p & m-xylene	µg/kg	5	MCERTS	-
Styrene	µg/kg	5	ISO 17025	-
Bromoform	µg/kg	5	NONE	-
o-xylene	µg/kg	5	MCERTS	-
Isopropylbenzene	µg/kg	5	ISO 17025	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-
Bromobenzene	µg/kg	5	NONE	-
N-Propylbenzene	µg/kg	5	ISO 17025	-
2-Chlorotoluene	µg/kg	5	ISO 17025	-
4-Chlorotoluene	µg/kg	5	ISO 17025	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-
Tert-Butylbenzene	µg/kg	5	ISO 17025	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-
Sec-Butylbenzene	µg/kg	5	ISO 17025	-
1,3-dichlorobenzene	µg/kg	5	ISO 17025	-
P-Isopropyltoluene	µg/kg	5	ISO 17025	-
1,4-dichlorobenzene	µg/kg	5	ISO 17025	-
1,2-dichlorobenzene	µg/kg	5	ISO 17025	-
Butylbenzene	µg/kg	5	NONE	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-
Hexachlorobutadiene	µg/kg	5	NONE	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-

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	ISO 17025	-
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	NONE	-
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	-

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Combined Report - Riverpark
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934434
Sample Reference				TP218
Sample Number				None Supplied
Depth (m)				1.40
Date Sampled				19/01/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-
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	NONE	-
Acenaphthylene	mg/kg	0.05	MCERTS	-
Acenaphthene	mg/kg	0.05	MCERTS	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-
Dibenzofuran	mg/kg	0.2	MCERTS	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-
4-Nitroaniline	mg/kg	0.2	NONE	-
Fluorene	mg/kg	0.05	MCERTS	-
Azobenzene	mg/kg	0.3	NONE	-
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	NONE	-
Anthraquinone	mg/kg	0.3	NONE	-
Fluoranthene	mg/kg	0.05	MCERTS	-
Pyrene	mg/kg	0.05	MCERTS	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-
Chrysene	mg/kg	0.05	MCERTS	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-
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	-

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-
PCB Congener 52	mg/kg	0.001	MCERTS	-
PCB Congener 101	mg/kg	0.001	MCERTS	-
PCB Congener 118	mg/kg	0.001	MCERTS	-
PCB Congener 138	mg/kg	0.001	MCERTS	-
PCB Congener 153	mg/kg	0.001	MCERTS	-
PCB Congener 180	mg/kg	0.001	MCERTS	-

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Combined Report - Riverpark
Project / Site name: Riverpark

Your Order No: 7227

Lab Sample Number				2933648	2933649	2933650	2934435
Sample Reference				TP217	WS204	WS208	TP/SA203
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.80	0.30
Date Sampled				17/01/2024	18/01/2024	17/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
General Inorganics							
pH (automated)	pH Units	N/A	ISO 17025	8	10.5	7.8	11.4
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	1.2	1.6	< 1.0
Total Phenols							
Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	1.2
Speciated PAHs							
Naphthalene	µg/l	0.01	NONE	< 0.01	0.66	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	NONE	< 0.01	0.27	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	NONE	< 0.01	0.2	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	NONE	< 0.01	0.32	< 0.01	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH							
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	1.5	< 0.2	< 0.2
Heavy Metals / Metalloids							
Arsenic (dissolved)	µg/l	1	ISO 17025	11	15	4.2	3.8
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	19	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1	30	0.6	5.7
Copper (dissolved)	µg/l	0.7	ISO 17025	7.4	30	43	69
Lead (dissolved)	µg/l	1	ISO 17025	3.6	10	< 1.0	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.1	0.7	5.1	1.5
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.9	8.1	16	5.3
Monoaromatics & Oxygenates							
Benzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons							
TPH1 (C10 - C40) EH_1D_TOTAL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10

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Combined Report - Riverpark
Project / Site name: Riverpark

Your Order No: 7227

Lab Sample Number				2933648	2933649	2933650	2934435
Sample Reference				TP217	WS204	WS208	TP/SA203
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.80	0.30
Date Sampled				17/01/2024	18/01/2024	17/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
TPH-CWG - Aliphatic >C5 - C6 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7 $_{HS\_1D\_AR}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 $_{HS\_1D\_AR}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 $_{HS\_1D\_AR}$	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Combined Report - Riverpark
Project / Site name: Riverpark

* 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 *
2933634	TP204	None Supplied	1.3	Brown clay with gravel.
2933635	TP211	None Supplied	0.2	Brown sand with stones.
2933636	TP212	None Supplied	1.5	Brown clay.
2933637	TP214	None Supplied	1.1	Brown clay.
2933638	TP215	None Supplied	0.8	Brown loam and gravel.
2933639	TP216	None Supplied	2	Brown clay and loam with gravel.
2933640	TP217	None Supplied	0.3	Brown loam and gravel with brick.
2933641	TP203	None Supplied	0.5	Brown sand with brick.
2933642	TP208/SA201	None Supplied	1.5	Brown clay.
2933643	WS202	None Supplied	1.3	Brown sandy clay with gravel.
2933644	WS204	None Supplied	1.8	Brown clay with gravel.
2933645	WS208	None Supplied	0.8	Brown sandy clay with gravel.
2933646	WS208	None Supplied	2.3	Brown clay with gravel.
2933647	WS211	None Supplied	0.5	Brown clay with gravel.
2934428	TP/SA203	None Supplied	0.3	Brown sand with gravel.
2934429	TP/SA203	None Supplied	0.6	Brown clay and sand with gravel.
2934430	TP205	None Supplied	0.5	Brown sand with gravel and brick.
2934431	TP207	None Supplied	0.9	Brown clay and sand with gravel.
2934432	TP209	None Supplied	0.2	Black sand with gravel and tar.
2934433	TP209	None Supplied	1.3	Brown clay and sand.
2934434	TP218	None Supplied	1.4	Brown clay and sand with gravel.

Combined Report - Riverpark
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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.	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
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
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

Combined Report - Riverpark
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-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.Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total 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.	L009-PL	D	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
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

Combined Report - Riverpark
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 24-001254

Replaces Analytical Report Number: 24-001254, issue no. 1
Additional analysis undertaken.
Missing anaysis from the clients water suite added by laboratory

Project / Site name:	Riverpark	**Samples received on:**	02/02/2024
Your job number:	17-246	**Samples instructed on/ Analysis started on:**	02/02/2024
Your order number:	007322	**Analysis completed by:**	20/02/2024
Report Issue Number:	2	**Report issued on:**	20/02/2024
Samples Analysed:	1 water sample		

Signed: A. Czerwińska

Agnieszka Czerwińska
Reporting Specialist
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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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

Analytical Report Number: 24-001254
Project / Site name: Riverpark

Your Order No: 007322

Lab Sample Number	108288
Sample Reference	DBHMW109
Sample Number	WS
Depth (m)	None Supplied
Date Sampled	01/02/2024
Time Taken	None Supplied

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L099)	pH Units	N/A	ISO 17025	12
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	4.8
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	U/S**
Total Phenols				
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10
Total Phenols (Monohydric) Low Level 1ug/l	µg/l	1	NONE	4.6
Speciated PAHs				
Naphthalene	µg/l	0.01	ISO 17025	0.33
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0.3
Fluorene	µg/l	0.01	ISO 17025	0.22
Phenanthrene	µg/l	0.01	ISO 17025	1.3
Anthracene	µg/l	0.01	ISO 17025	0.31
Fluoranthene	µg/l	0.01	ISO 17025	1.8
Pyrene	µg/l	0.01	ISO 17025	1.6
Benzo(a)anthracene	µg/l	0.01	ISO 17025	0.7
Chrysene	µg/l	0.01	ISO 17025	0.83
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	0.82
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	0.34
Benzo(a)pyrene	µg/l	0.01	ISO 17025	0.74
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	0.4
Dibenzo(a,h)anthracene	µg/l	0.01	ISO 17025	0.1
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	0.49
Heavy Metals / Metalloids				
Arsenic (dissolved)	µg/l	0.15	ISO 17025	4.31
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	4.3
Copper (dissolved)	µg/l	0.5	ISO 17025	18
Lead (dissolved)	µg/l	0.2	ISO 17025	2.8
Manganese (dissolved)	µg/l	0.05	ISO 17025	0.91
Mercury (dissolved)	µg/l	0.05	ISO 17025	0.18
Nickel (dissolved)	µg/l	0.5	ISO 17025	12
Selenium (dissolved)	µg/l	0.6	ISO 17025	5.1
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.7
Cadmium (dissolved)	mg/l	0.00008	ISO 17025	< 0.00008
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 24-001254
Project / Site name: Riverpark

Your Order No: 007322

Lab Sample Number	108288
Sample Reference	DBHMW109
Sample Number	WS
Depth (m)	None Supplied
Date Sampled	01/02/2024
Time Taken	None Supplied

Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	
Petroleum Hydrocarbons				
TPH - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >C10 - C12 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH - Aliphatic >C12 - C16 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH - Aliphatic >C16 - C21 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH - Aliphatic >C21 - C35 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH - Aliphatic >C5 - C35 HS+EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC7 - EC8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC8 - EC10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC10 - EC12 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10
TPH - Aromatic >EC12 - EC16 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	16
TPH - Aromatic >EC16 - EC21 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	45
TPH - Aromatic >EC21 - EC35 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	75
TPH - Aromatic >EC5 - EC35 HS+EH_1D_AR_#1_#2_MS	µg/l	10	NONE	140
TPH (C10 - C40) EH_1D_TOTAL_#1_#2_MS	µg/l	10	NONE	140
VOCs				
Chloromethane	µg/l	3	ISO 17025	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0
2,2-Dichloropropane	µg/l	3	NONE	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0

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Analytical Report Number: 24-001254
Project / Site name: Riverpark

Your Order No: 007322

Lab Sample Number				108288
Sample Reference				DBHMW109
Sample Number				WS
Depth (m)				None Supplied
Date Sampled				01/02/2024
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Chlorobenzene	µg/l	3	ISO 17025	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	NONE	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	1.9
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	< 0.1
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
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	0.19

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Analytical Report Number: 24-001254
Project / Site name: Riverpark

Your Order No: 007322

Lab Sample Number				108288
Sample Reference				DBHMW109
Sample Number				WS
Depth (m)				None Supplied
Date Sampled				01/02/2024
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
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
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.1
Dibenzofuran	µg/l	0.05	NONE	0.16
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
Azobenzene	µg/l	0.05	NONE	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.050
Carbazole	µg/l	0.05	NONE	0.2
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05
Anthraquinone	µg/l	0.05	NONE	0.17
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05
3+4-Methylphenol	µg/l	0.1	NONE	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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4041

Analytical Report Number : 24-001254
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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	L012B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GC-MS/GC-MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L070B/L088	W	ISO 17025
Total petroleum hydrocarbons by GC-MS/GC MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS	In-house method	L070B/L088	W	NONE
BTEX and/or 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 USEPA 8260	L073B	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	W	ISO 17025
Monohydric phenols (low level) in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	ISO 17025
Total cyanide (low level) in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L099	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAH) in leachate by extraction in dichloromethane followed by GC-MS	In-house method based on USEPA 8270	L102B	W	ISO 17025
Phenols in water by GC-MS	Determination of phenols in water by GC-MS	In-house method	L102B	W	NONE
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

** U/S - Unsuitable for analysis due to sample matrix

Sample Deviation Report

Analytical Report Number : 24-001254
Project / Site name: Riverpark

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
DBHMW109	WS	W	108288	c	pH at 20°C in water (automated)	L099	c
DBHMW109	WS	W	108288	c	Dissolved Organic Carbon in water	L037B	c
DBHMW109	WS	W	108288	c	Metals in water by ICP-MS (dissolved)	L012B	c
DBHMW109	WS	W	108288	c	Metals in water by ICP-OES (dissolved)	L039B	c

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Analytical Report Number : 24-001293

Replaces Analytical Report Number: 24-001293, issue no. 1
Additional analysis undertaken.
Missing anaysis from the clients water suite added by laboratory

Project / Site name:	Riverpark	**Samples received on:**	02/02/2024
Your job number:	17-246	**Samples instructed on/ Analysis started on:**	02/02/2024
Your order number:	007322	**Analysis completed by:**	20/02/2024
Report Issue Number:	2	**Report issued on:**	20/02/2024
Samples Analysed:	4 water samples		

Signed: A. Czerwińska

Agnieszka Czerwińska
Reporting Specialist
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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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

Analytical Report Number: 24-001293
Project / Site name: Riverpark

Your Order No: 007322

Lab Sample Number				108383	108384	108385	108386
Sample Reference				WS102	WS109	DBHMW 107	CP102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				01/02/2024	01/02/2024	01/02/2024	01/02/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
General Inorganics							
pH (L099)	pH Units	N/A	ISO 17025	7.8	7.7	8.8	7.4
Total Cyanide	µg/l	10	ISO 17025	< 10	150	29	< 10
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	26.8	5.73	11.2	7.4
Total Phenols							
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Speciated PAHs							
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.89	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.21	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.64	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.15	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	1.1	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	1.1	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.49	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.56	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.68	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.19	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.56	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.27	< 0.01
Dibenzo(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	0.35	< 0.01
Heavy Metals / Metalloids							
Arsenic (dissolved)	µg/l	0.15	ISO 17025	3.61	0.87	11.6	1.26
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.04	0.06	< 0.02	0.05
Chromium (dissolved)	µg/l	0.2	ISO 17025	1	2.2	0.3	1
Copper (dissolved)	µg/l	0.5	ISO 17025	19	5.4	1.1	6.9
Lead (dissolved)	µg/l	0.2	ISO 17025	0.9	< 0.2	0.5	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	68	340	99	71
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	-	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	8.6	4.1	3.6	3
Selenium (dissolved)	µg/l	0.6	ISO 17025	3.4	54	59	1.7
Zinc (dissolved)	µg/l	0.5	ISO 17025	14	5.6	2.1	8.2
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	-	-	< 0.5	-
Petroleum Hydrocarbons							
TPH - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >C10 - C12 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH - Aliphatic >C12 - C16 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH - Aliphatic >C16 - C21 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH - Aliphatic >C21 - C35 EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH - Aliphatic >C5 - C35 HS+EH_1D_AL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10

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Analytical Report Number: 24-001293
Project / Site name: Riverpark

Your Order No: 007322

Lab Sample Number				108383	108384	108385	108386
Sample Reference				WS102	WS109	DBHMW 107	CP102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				01/02/2024	01/02/2024	01/02/2024	01/02/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
TPH - Aromatic >EC5 - EC7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC7 - EC8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC8 - EC10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC10 - EC12 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH - Aromatic >EC12 - EC16 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH - Aromatic >EC16 - EC21 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	22	< 10
TPH - Aromatic >EC21 - EC35 EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	12	< 10
TPH - Aromatic >EC5 - EC35 HS+EH_1D_AR_#1_#2_MS	µg/l	10	NONE	< 10	< 10	34	< 10
TPH (C10 - C40) EH_1D_TOTAL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	34	< 10

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 24-001293
Project / Site name: Riverpark

Your Order No: 007322

Lab Sample Number				108383	108384	108385	108386
Sample Reference				WS102	WS109	DBHMW 107	CP102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				01/02/2024	01/02/2024	01/02/2024	01/02/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
SVOCs							
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 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
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 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
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05

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Analytical Report Number: 24-001293
Project / Site name: Riverpark

Your Order No: 007322

Lab Sample Number				108383	108384	108385	108386
Sample Reference				WS102	WS109	DBHMW 107	CP102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				01/02/2024	01/02/2024	01/02/2024	01/02/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Hexachlorobenzene	µg/l	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
3+4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 24-001293
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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	L012B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GC-MS/GC-MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L070B/L088	W	ISO 17025
Total petroleum hydrocarbons by GC-MS/GC-MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS	In-house method	L070B/L088	W	NONE
BTEX and/or 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 USEPA 8260	L073B	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	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	ISO 17025
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L099	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAH) in leachate by extraction in dichloromethane followed by GC-MS	In-house method based on USEPA 8270	L102B	W	ISO 17025
Phenols in water by GC-MS	Determination of phenols in water by GC-MS	In-house method	L102B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 24-001293
Project / Site name: Riverpark

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS102	None Supplied	W	108383	c	pH at 20°C in water (automated)	L099	c
WS109	None Supplied	W	108384	c	pH at 20°C in water (automated)	L099	c
DBHMW 107	None Supplied	W	108385	c	pH at 20°C in water (automated)	L100	c
CP102	None Supplied	W	108386	c	pH at 20°C in water (automated)	L101	c
WS102	None Supplied	W	108383	c	Dissolved Organic Carbon in water	L037B	c
WS109	None Supplied	W	108384	c	Dissolved Organic Carbon in water	L037B	c
DBHMW 107	None Supplied	W	108385	c	Dissolved Organic Carbon in water	L037B	c
CP102	None Supplied	W	108386	c	Dissolved Organic Carbon in water	L037B	c
WS102	None Supplied	W	108383	c	Metals in water by ICP-MS (dissolved)	L012B	c
WS109	None Supplied	W	108384	c	Metals in water by ICP-MS (dissolved)	L012B	c
DBHMW 107	None Supplied	W	108385	c	Metals in water by ICP-MS (dissolved)	L012B	c
CP102	None Supplied	W	108386	c	Metals in water by ICP-MS (dissolved)	L012B	c
WS102	None Supplied	W	108383	c	Metals in water by ICP-OES (dissolved)	L039B	c
WS109	None Supplied	W	108384	c	Metals in water by ICP-OES (dissolved)	L039B	c
DBHMW 107	None Supplied	W	108385	c	Metals in water by ICP-OES (dissolved)	L039B	c
CP102	None Supplied	W	108386	c	Metals in water by ICP-OES (dissolved)	L039B	c

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Analytical Report Number : 19-70847

Replaces Analytical Report Number : 19-70847, issue no. 1

Project / Site name:	Riverpark Trading Estate	**Samples received on:**	07/11/2019
Your job number:	13-492	**Samples instructed on:**	08/11/2019
Your order number:	13492-33562-AG	**Analysis completed by:**	05/12/2019
Report Issue Number:	2	**Report issued on:**	05/12/2019
Samples Analysed:	3 leachate samples - 11 soil samples		

Signed: [redacted]

Katarzyna Lewicka
Head of Reporting Section

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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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

Analytical Report Number: 19-70847

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33562-AG

Lab Sample Number				1356639	1356640	1356641	1356642	1356643
Sample Reference				TP103	TP105	TP108	WS102	TP106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	1.20	0.90	1.00
Date Sampled				05/11/2019	05/11/2019	05/11/2019	06/11/2019	05/11/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	18	11	15	13
Total mass of sample received	kg	0.001	NONE	0.53	0.40	0.40	0.43	0.41
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.4	-	-	8.0	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	160	-	-	210	410
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	42	-	-	80	140
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.021	-	-	0.040	0.070
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	21.1	-	-	40.1	70.2
Sulphide	mg/kg	1	MCERTS	2.3	-	-	14	3.2
Total Sulphur	mg/kg	50	MCERTS	210	-	-	510	500
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	1.0	0.7	1.2	0.8
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.53
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.23
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.28	< 0.05	< 0.05	0.16
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	1.8	< 0.05	0.81	1.3
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.33	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.4	< 0.05	0.87	0.45
Pyrene	mg/kg	0.05	MCERTS	< 0.05	1.4	< 0.05	0.76	0.37
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.72	< 0.05	0.34	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.46	< 0.05	0.32	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.35	< 0.05	0.38	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.33	< 0.05	0.16	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.41	< 0.05	0.26	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	7.47	< 0.80	3.90	2.99

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Analytical Report Number: 19-70847

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33562-AG

Lab Sample Number				1356639	1356640	1356641	1356642	1356643
Sample Reference				TP103	TP105	TP108	WS102	TP106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	1.20	0.90	1.00
Date Sampled				05/11/2019	05/11/2019	05/11/2019	06/11/2019	05/11/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	6.3	6.9	9.1	9.2
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	93	120	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.90	1.1	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	-	-	28	31
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	16	22	32	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	16	9.7	19	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	20	30	31	34
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	2.4	< 1.0	1.6	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	32	27	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	43	50	62	58
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	38	< 1.0
TPH (C21 - C35)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	68	< 1.0
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40	mg/kg	10	MCERTS	< 10	< 10	< 10	110	< 10

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Analytical Report Number: 19-70847

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33562-AG

Lab Sample Number				1356644	1356645	1356646	1356647	1356648
Sample Reference				TP102	TP105	WS105	WS107	WS101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.30	0.30	0.70	0.20
Date Sampled				05/11/2019	05/11/2019	06/11/2019	06/11/2019	06/11/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	19	18	20	15
Total mass of sample received	kg	0.001	NONE	0.41	0.45	0.41	0.45	0.38
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	< 0.001
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.7	-	-	8.5	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	630	-	-	410	660
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	130	-	-	220	110
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.066	-	-	0.11	0.055
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	66.0	-	-	108	54.7
Sulphide	mg/kg	1	MCERTS	33	-	-	290	13
Total Sulphur	mg/kg	50	MCERTS	890	-	-	1000	700
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.5	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.66	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.20	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.62	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.79	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	5.3	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	1.0	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.26	4.6	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.28	4.6	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	2.4	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	2.6	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.9	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.1	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.9	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.66	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.96	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	29.3	< 0.80	< 0.80	< 0.80

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Analytical Report Number: 19-70847

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33562-AG

Lab Sample Number				1356644	1356645	1356646	1356647	1356648
Sample Reference				TP102	TP105	WS105	WS107	WS101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.30	0.30	0.70	0.20
Date Sampled				05/11/2019	05/11/2019	06/11/2019	06/11/2019	06/11/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	57	9.0	15	10
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	210	140	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	1.6	0.95	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	1.0	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	-	-	19	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	43	93	23	28	41
Lead (aqua regia extractable)	mg/kg	1	MCERTS	36	72	29	11	75
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	33	36	20	21	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	3.2	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	46	25	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	38	340	75	15	67

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	8.0	12	2.7	< 2.0	10
TPH (C12 - C16)	mg/kg	4	MCERTS	13	29	6.1	< 4.0	20
TPH (C16 - C21)	mg/kg	1	MCERTS	26	75	36	< 1.0	45
TPH (C21 - C35)	mg/kg	1	MCERTS	160	190	180	< 1.0	150
TPH (C35 - C40)	mg/kg	10	MCERTS	47	46	13	< 10	37
TPH Total C5 - C40	mg/kg	10	MCERTS	270	360	240	< 10	280

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Analytical Report Number: 19-70847

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33562-AG

Lab Sample Number				1356649				
Sample Reference				WS102				
Sample Number				None Supplied				
Depth (m)				0.40				
Date Sampled				06/11/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	13				
Total mass of sample received	kg	0.001	NONE	0.43				
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	-				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	-				
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-				
Sulphide	mg/kg	1	MCERTS	-				
Total Sulphur	mg/kg	50	MCERTS	-				
Total Organic Carbon (TOC)	%	0.1	MCERTS	-				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.34				
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	0.85				
Anthracene	mg/kg	0.05	MCERTS	0.30				
Fluoranthene	mg/kg	0.05	MCERTS	2.2				
Pyrene	mg/kg	0.05	MCERTS	1.9				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.65				
Chrysene	mg/kg	0.05	MCERTS	0.51				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.40				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.35				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.26				
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	7.77				

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Analytical Report Number: 19-70847

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33562-AG

Lab Sample Number				1356649				
Sample Reference				WS102				
Sample Number				None Supplied				
Depth (m)				0.40				
Date Sampled				06/11/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	500				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1				
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	-				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	450				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150				
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0				
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C10 - C12)	mg/kg	2	MCERTS	16				
TPH (C12 - C16)	mg/kg	4	MCERTS	8.5				
TPH (C16 - C21)	mg/kg	1	MCERTS	32				
TPH (C21 - C35)	mg/kg	1	MCERTS	85				
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10				
TPH Total C5 - C40	mg/kg	10	MCERTS	160				

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Analytical Report Number: 19-70847
Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33562-AG

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
1356648	WS101	0.20	119	Loose Fibres	**Amosite**	< 0.001	**< 0.001**

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

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Analytical Report Number: 19-70847

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33562-AG

Lab Sample Number				1356650	1356651	1356652		
Sample Reference				TP103	TP106	TP109		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.40	0.40	0.20		
Date Sampled				05/11/2019	05/11/2019	05/11/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.9	8.1	7.6		
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Total Phenols								
Total Phenols (monohydric)	µg/l	1	ISO 17025	4.9	6.4	5.2		
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
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		
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
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		
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		
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	NONE	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2		
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	11	11	18		
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08		
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0		
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.0	2.9	4.5		
Copper (dissolved)	µg/l	0.7	ISO 17025	19	14	12		
Lead (dissolved)	µg/l	1	ISO 17025	6.2	3.9	57		
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5		
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.8	0.4	1.6		
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0		
Zinc (dissolved)	µg/l	0.4	ISO 17025	14	3.7	14		

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Analytical Report Number: 19-70847

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33562-AG

Lab Sample Number				1356650	1356651	1356652		
Sample Reference				TP103	TP106	TP109		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.40	0.40	0.20		
Date Sampled				05/11/2019	05/11/2019	05/11/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10		
Petroleum Hydrocarbons								
TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		

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Analytical Report Number : 19-70847

Project / Site name: Riverpark Trading Estate

* 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 *
1356639	TP103	None Supplied	0.90	Brown clay with gravel and vegetation.
1356640	TP105	None Supplied	1.00	Brown clay and sand.
1356641	TP108	None Supplied	1.20	Brown clay.
1356642	WS102	None Supplied	0.90	Brown clay with gravel.
1356643	TP106	None Supplied	1.00	Brown clay with gravel.
1356644	TP102	None Supplied	0.50	Brown loam and gravel.
1356645	TP105	None Supplied	0.30	Brown loam and gravel.
1356646	WS105	None Supplied	0.30	Brown clay with gravel and brick.
1356647	WS107	None Supplied	0.70	Brown clay with gravel and brick.
1356648	WS101	None Supplied	0.20	Brown clay with gravel and brick.
1356649	WS102	None Supplied	0.40	Brown clay with gravel and brick.

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Analytical Report Number : 19-70847

Project / Site name: Riverpark Trading Estate

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
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
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. (30 oC)	In-house method based on BS1377 Part 2, 1990, Classification tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
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
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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

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Analytical Report Number : 19-70847

Project / Site name: Riverpark Trading Estate

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
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total 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 Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 19-71234

Replaces Analytical Report Number : 19-71234, issue no. 1

Project / Site name:	Riverpark Trading Estate	**Samples received on:**	11/11/2019
Your job number:	13-492	**Samples instructed on:**	11/11/2019
Your order number:	13492-33566-EF	**Analysis completed by:**	05/12/2019
Report Issue Number:	2	**Report issued on:**	05/12/2019
Samples Analysed:	3 leachate samples - 12 soil samples		

Signed: [redacted]

Katarzyna Lewicka
Head of Reporting Section

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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 19-71234

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33566-EF

Lab Sample Number				1358711	1358712	1358713	1358714	1358715
Sample Reference				WS109	WS111	WS114	WS117	WS119
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.90	0.50	0.80	0.20
Date Sampled				07/11/2019	07/11/2019	07/11/2019	08/11/2019	08/11/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	20	17	15	14	16
Total mass of sample received	kg	0.001	NONE	0.45	0.41	0.45	0.38	0.96
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6	8.3	9.1	8.0	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	630	610	660	680	590
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	130	270	130	100	41
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.067	0.14	0.066	0.050	0.020
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	66.6	136	65.8	50.1	20.3
Sulphide	mg/kg	1	MCERTS	6.0	11	23	< 1.0	5.8
Total Sulphur	mg/kg	50	MCERTS	680	530	750	470	310
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	1.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.59	< 0.05	0.26	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.0	0.49
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.55	0.39
Phenanthrene	mg/kg	0.05	MCERTS	0.63	< 0.05	0.35	5.8	3.1
Anthracene	mg/kg	0.05	MCERTS	0.19	< 0.05	< 0.05	0.97	0.67
Fluoranthene	mg/kg	0.05	MCERTS	0.95	< 0.05	0.49	9.0	4.0
Pyrene	mg/kg	0.05	MCERTS	0.97	< 0.05	0.48	7.6	3.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.62	< 0.05	0.29	3.7	1.6
Chrysene	mg/kg	0.05	MCERTS	0.42	< 0.05	0.27	4.1	1.3
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.71	< 0.05	0.19	2.0	1.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.22	< 0.05	0.07	1.8	0.79
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.53	< 0.05	< 0.05	3.4	1.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.31	< 0.05	< 0.05	1.7	0.62
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.45	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.36	< 0.05	< 0.05	1.6	0.70
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	6.50	< 0.80	2.40	43.6	20.6

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Analytical Report Number: 19-71234

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33566-EF

Lab Sample Number				1358711	1358712	1358713	1358714	1358715
Sample Reference				WS109	WS111	WS114	WS117	WS119
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.90	0.50	0.80	0.20
Date Sampled				07/11/2019	07/11/2019	07/11/2019	08/11/2019	08/11/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	110	9.3	14	23	15
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.3
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	30	40	34	63
Copper (aqua regia extractable)	mg/kg	1	MCERTS	170	21	59	37	49
Lead (aqua regia extractable)	mg/kg	1	MCERTS	310	17	32	77	66
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	53	30	68	37	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	54	60	95	94
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	14	< 2.0	8.5	< 2.0	8.3
TPH (C12 - C16)	mg/kg	4	MCERTS	590	< 4.0	11	4.6	61
TPH (C16 - C21)	mg/kg	1	MCERTS	760	< 1.0	< 1.0	57	220
TPH (C21 - C35)	mg/kg	1	MCERTS	220	< 1.0	< 1.0	140	690
TPH (C35 - C40)	mg/kg	10	MCERTS	11	< 10	< 10	< 10	90
TPH Total C5 - C40	mg/kg	10	MCERTS	1600	< 10	30	200	1100

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Analytical Report Number: 19-71234

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33566-EF

Lab Sample Number				1358716	1358717	1358718	1358719	1358720
Sample Reference				WS122	WS123	WS125	WS112	WS118
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.70	1.20	0.30	2.10	0.90
Date Sampled				08/11/2019	08/11/2019	08/11/2019	07/11/2019	07/11/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	20	7.7	5.6	22	19
Total mass of sample received	kg	0.001	NONE	0.46	0.43	0.46	0.46	0.50
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	8.1	8.6	10.5	8.0	8.5
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	1800	850	1200	480	650
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	270	86	220	82	200
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.13	0.043	0.11	0.041	0.10
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	134	42.8	109	41.2	100
Sulphide	mg/kg	1	MCERTS	< 1.0	86	38	3.9	6.5
Total Sulphur	mg/kg	50	MCERTS	1100	940	1000	420	520
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	1.6	0.8
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.31	< 0.05	0.59	0.92	0.45
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.27	0.45	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.30	0.82	2.1	0.22
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.28	0.84	2.2	0.46
Phenanthrene	mg/kg	0.05	MCERTS	2.1	1.9	6.6	14	2.1
Anthracene	mg/kg	0.05	MCERTS	0.64	0.64	1.9	2.9	0.43
Fluoranthene	mg/kg	0.05	MCERTS	4.1	6.8	11	16	1.8
Pyrene	mg/kg	0.05	MCERTS	4.0	8.1	11	16	2.0
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.8	4.0	5.6	9.8	1.1
Chrysene	mg/kg	0.05	MCERTS	1.8	3.0	4.1	6.4	0.75
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.9	6.6	5.7	8.3	0.74
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.85	2.9	2.9	2.6	0.37
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.5	6.5	5.8	6.9	0.71
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.71	2.9	2.6	2.9	0.29
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.23	0.86	0.77	1.1	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.84	3.3	2.8	3.4	0.37
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	20.8	48.1	63.9	96.0	11.8

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Analytical Report Number: 19-71234

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33566-EF

Lab Sample Number				1358716	1358717	1358718	1358719	1358720
Sample Reference				WS122	WS123	WS125	WS112	WS118
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.70	1.20	0.30	2.10	0.90
Date Sampled				08/11/2019	08/11/2019	08/11/2019	07/11/2019	07/11/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	45	4.9	6.3	16	11
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.5	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	40	18	29	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	85	57	25	64	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	67	35	29	92	23
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	38	58	35	39	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	4.5	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	88	140	47	76	69

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	23	16	< 2.0	36	5.6
TPH (C12 - C16)	mg/kg	4	MCERTS	87	66	< 4.0	80	230
TPH (C16 - C21)	mg/kg	1	MCERTS	300	580	300	190	340
TPH (C21 - C35)	mg/kg	1	MCERTS	700	5600	3400	220	640
TPH (C35 - C40)	mg/kg	10	MCERTS	120	2000	1600	15	69
TPH Total C5 - C40	mg/kg	10	MCERTS	1300	8300	5300	580	1300

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Analytical Report Number: 19-71234

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33566-EF

Lab Sample Number				1358721	1358722			
Sample Reference				WS121	WS122			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.90	1.20			
Date Sampled				08/11/2019	08/11/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	14	15			
Total mass of sample received	kg	0.001	NONE	0.42	0.42			
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-			
Asbestos in Soil	Type	N/A	ISO 17025	-	-			
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-			
Asbestos Quantification Total	%	0.001	ISO 17025	-	-			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	8.6			
Total Cyanide	mg/kg	1	MCERTS	-	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	430			
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	140			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.070			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	69.8			
Sulphide	mg/kg	1	MCERTS	-	16			
Total Sulphur	mg/kg	50	MCERTS	-	580			
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.5	0.8			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	0.20			
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	-	0.48			
Anthracene	mg/kg	0.05	MCERTS	-	0.12			
Fluoranthene	mg/kg	0.05	MCERTS	-	1.0			
Pyrene	mg/kg	0.05	MCERTS	-	1.0			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.55			
Chrysene	mg/kg	0.05	MCERTS	-	0.43			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	0.62			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.31			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	0.51			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.28			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.32			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	5.84			

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Analytical Report Number: 19-71234

Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33566-EF

Lab Sample Number				1358721	1358722			
Sample Reference				WS121	WS122			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.90	1.20			
Date Sampled				08/11/2019	08/11/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	9.9			
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	-	30			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	27			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	19			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	30			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	65			

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	-	< 1.0			
TPH (C6 - C8)	mg/kg	0.1	MCERTS	-	< 0.1			
TPH (C8 - C10)	mg/kg	0.1	MCERTS	-	< 0.1			
TPH (C10 - C12)	mg/kg	2	MCERTS	-	17			
TPH (C12 - C16)	mg/kg	4	MCERTS	-	39			
TPH (C16 - C21)	mg/kg	1	MCERTS	-	39			
TPH (C21 - C35)	mg/kg	1	MCERTS	-	220			
TPH (C35 - C40)	mg/kg	10	MCERTS	-	83			
TPH Total C5 - C40	mg/kg	10	MCERTS	-	410			

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Analytical Report Number: 19-71234
Project / Site name: Riverpark Trading Estate
Your Order No: 13492-33566-EF

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
1358713	WS114	0.50	77	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

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

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Analytical Report Number: 19-71234

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33566-EF

Lab Sample Number				1358723	1358724	1358725		
Sample Reference				WS117	WS118	WS123		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.80	0.30	0.40		
Date Sampled				08/11/2019	07/11/2019	08/11/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.4	7.8	7.9		
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Total Phenols								
Total Phenols (monohydric)	µg/l	1	ISO 17025	2.8	2.7	3.2		
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
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		
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
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		
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		
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	NONE	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2		
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	< 1.1	< 1.1		
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08		
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0		
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.3	2.9	0.8		
Copper (dissolved)	µg/l	0.7	ISO 17025	10	7.9	6.5		
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	2.0		
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5		
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.3	0.3	< 0.3		
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0		
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.8	2.6	3.0		

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Analytical Report Number: 19-71234

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33566-EF

Lab Sample Number				1358723	1358724	1358725		
Sample Reference				WS117	WS118	WS123		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.80	0.30	0.40		
Date Sampled				08/11/2019	07/11/2019	08/11/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10		
Petroleum Hydrocarbons								
TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		

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Analytical Report Number : 19-71234

Project / Site name: Riverpark Trading Estate

* 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 *
1358711	WS109	None Supplied	0.50	Brown gravel with brick and oil / petroleum. **
1358712	WS111	None Supplied	0.90	Grey clay with gravel.
1358713	WS114	None Supplied	0.50	Brown gravel with brick. **
1358714	WS117	None Supplied	0.80	Brown clay and loam with gravel.
1358715	WS119	None Supplied	0.20	Brown clay with brick.
1358716	WS122	None Supplied	0.70	Brown clay and loam with gravel.
1358717	WS123	None Supplied	1.20	Brown clay and loam with gravel and vegetation.
1358718	WS125	None Supplied	0.30	Brown clay and loam with gravel and brick.
1358719	WS112	None Supplied	2.10	Brown clay with gravel.
1358720	WS118	None Supplied	0.90	Brown clay with gravel.
1358721	WS121	None Supplied	0.90	Brown clay with gravel.
1358722	WS122	None Supplied	1.20	Brown clay with vegetation and gravel

** Non MCERTS matrix.

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Analytical Report Number : 19-71234

Project / Site name: Riverpark Trading Estate

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
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
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. (30 oC)	In-house method based on BS1377 Part 2, 1990, Classification tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
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
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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

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Analytical Report Number : 19-71234

Project / Site name: Riverpark Trading Estate

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
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total 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 Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 19-74137

Project / Site name:	Riverpark Trading Estate	**Samples received on:**	25/11/2019
Your job number:	13-492	**Samples instructed on:**	26/11/2019
Your order number:	13492-33964-EF	**Analysis completed by:**	03/12/2019
Report Issue Number:	1	**Report issued on:**	03/12/2019
Samples Analysed:	6 water samples		

Signed:

Zina Abdul Razzak
Senior Quality Specialist

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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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

Analytical Report Number: 19-74137

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33964-EF

Lab Sample Number				1373901	1373902	1373903	1373904	1373905
Sample Reference				WS101	WS106	WS112	WS114	WS117
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019
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	8.3	7.7	7.3	7.6	8.0
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	1.3	< 1.0	< 1.0	< 1.0	2.4
Total Phenols								
Total Phenols (monohydric)	µg/l	1	ISO 17025	6.8	3.8	3.3	4.5	3.7
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	19.9	2.47	3.39	0.74	2.65
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.05	0.08	0.04	< 0.02	0.06
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.9	0.8	0.8	0.9	1.1
Copper (dissolved)	µg/l	0.5	ISO 17025	3.1	0.9	3.4	1.9	3.1
Lead (dissolved)	µg/l	0.2	ISO 17025	6.6	6.0	0.9	0.6	1.6
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	4.5	9.9	4.7	2.8	2.0
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.0	5.8	2.4	4.8	4.8
Zinc (dissolved)	µg/l	0.5	ISO 17025	6.0	8.1	5.8	3.2	3.2
Monoaromatics & Oxygenates								
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	< 10	< 10	< 10	< 10	< 10
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

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Analytical Report Number: 19-74137

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33964-EF

Lab Sample Number				1373901	1373902	1373903	1373904	1373905
Sample Reference				WS101	WS106	WS112	WS114	WS117
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019
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	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 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	< 1.0	< 1.0
Cis-1,2-dichloroethene	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
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	17.8	12.6	13.1	11.1	11.4
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	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
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	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
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	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
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Analytical Report Number: 19-74137

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33964-EF

Lab Sample Number				1373901	1373902	1373903	1373904	1373905
Sample Reference				WS101	WS106	WS112	WS114	WS117
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019
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	< 0.05	< 0.05
Phenol	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
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	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
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	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
Isophorone	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
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	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
2,4,6-Trichlorophenol	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-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 19-74137

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33964-EF

Lab Sample Number				1373906				
Sample Reference				WS123				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				22/11/2019				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	11.8				
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	8.7				
Total Phenols								
Total Phenols (monohydric)	µg/l	1	ISO 17025	8.0				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.77				
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.04				
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0				
Chromium (dissolved)	µg/l	0.2	ISO 17025	1.6				
Copper (dissolved)	µg/l	0.5	ISO 17025	14				
Lead (dissolved)	µg/l	0.2	ISO 17025	0.7				
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05				
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.6				
Selenium (dissolved)	µg/l	0.6	ISO 17025	5.9				
Zinc (dissolved)	µg/l	0.5	ISO 17025	1.6				
Monoaromatics & Oxygenates								
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				
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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Analytical Report Number: 19-74137

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33964-EF

Lab Sample Number				1373906				
Sample Reference				WS123				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				22/11/2019				
Time Taken				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	9.4				
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				

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Analytical Report Number: 19-74137

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33964-EF

Lab Sample Number				1373906				
Sample Reference				WS123				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				22/11/2019				
Time Taken				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				

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 19-74137

Project / Site name: Riverpark Trading Estate

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
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
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	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
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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.

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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
WS101		W	19-74137	1373901	c	pH at 20oC in water (automated)	L099-PL	c
WS106		W	19-74137	1373902	c	pH at 20oC in water (automated)	L099-PL	c
WS112		W	19-74137	1373903	c	pH at 20oC in water (automated)	L099-PL	c
WS114		W	19-74137	1373904	c	pH at 20oC in water (automated)	L099-PL	c
WS117		W	19-74137	1373905	c	pH at 20oC in water (automated)	L099-PL	c
WS123		W	19-74137	1373906	c	pH at 20oC in water (automated)	L099-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 24-79349

Replaces Analytical Report Number: 24-79349, issue no. 1
Additional analysis undertaken.
Quantification added to positive sample as per client's request.

Project / Site name:	Riverpark	**Samples received on:**	22/01/2024
Your job number:	17-246	**Samples instructed on/ Analysis started on:**	22/01/2024
Your order number:	7227	**Analysis completed by:**	14/03/2024
Report Issue Number:	2	**Report issued on:**	20/03/2024
Samples Analysed:	1 leachate sample - 7 soil samples		

Signed:

Joanna Szwagrzak
Reporting Specialist
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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 24-79349
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934428	2934429	2934430	2934431	2934432
Sample Reference				TP/SA203	TP/SA203	TP205	TP207	TP209
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.50	0.90	0.20
Date Sampled				19/01/2024	19/01/2024	19/01/2024	19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	13	10	10	5
Total mass of sample received	kg	0.001	NONE	0.8	0.3	0.2	0.2	0.3
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Detected	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001	-	-
Asbestos Analyst ID	N/A	N/A	N/A	DBU	N/A	DBU	N/A	DBU
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.9	8.5	9.5	8.6	8.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	2700	370	930	410	180
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.015	0.065	0.13	0.075	0.014
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	29	130	250	150	27
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	14.5	65.1	126	74.5	13.5
Sulphide	mg/kg	1	MCERTS	11	11	44	17	2.2
Total Sulphur	mg/kg	50	MCERTS	1100	1500	770	810	260
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.9	0.6	1.9	0.7	5.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.16	< 0.05	0.11	< 0.05	0.73
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.08	< 0.05	0.21
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.09	< 0.05	0.35
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.34
Phenanthrene	mg/kg	0.05	MCERTS	0.15	< 0.05	0.64	< 0.05	0.43
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.13	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.17	< 0.05	0.65	< 0.05	0.1
Pyrene	mg/kg	0.05	MCERTS	0.16	< 0.05	0.7	< 0.05	0.16
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.09	< 0.05	0.34	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.1	< 0.05	0.47	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.11	< 0.05	0.36	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	0.12	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.07	< 0.05	0.24	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.16	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.28	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.01	< 0.80	4.37	< 0.80	2.32

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Analytical Report Number: 24-79349
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934428	2934429	2934430	2934431	2934432
Sample Reference				TP/SA203	TP/SA203	TP205	TP207	TP209
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.60	0.50	0.90	0.20
Date Sampled				19/01/2024	19/01/2024	19/01/2024	19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.7	9.8	12	7.4	3.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	1.2	< 0.2	0.3
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	28	22	21	10
Copper (aqua regia extractable)	mg/kg	1	MCERTS	40	21	39	18	7.7
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	11	140	22	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	32	26	24	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	32	51	140	48	23
Petroleum Hydrocarbons								
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	3.2	< 2.0	2.4
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	< 4.0	< 4.0	75	< 4.0	14
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10	220	< 10	91
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	21	< 10	720	< 10	1300
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	< 10	470	< 10	830
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	31	< 10	1500	< 10	2300

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-79349
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934433	2934434
Sample Reference				TP209	TP218
Sample Number				None Supplied	None Supplied
Depth (m)				1.30	1.40
Date Sampled				19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	9.9
Total mass of sample received	kg	0.001	NONE	0.2	0.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	440	250
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.08	0.029
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	160	57
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	79.8	28.7
Sulphide	mg/kg	1	MCERTS	11	< 1.0
Total Sulphur	mg/kg	50	MCERTS	570	370
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.6	0.5

Total Phenols

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

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	ISO 17025	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 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	ISO 17025	< 0.80	< 0.80

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Analytical Report Number: 24-79349
Project / Site name: Riverpark
Your Order No: 7227

Lab Sample Number				2934433	2934434
Sample Reference				TP209	TP218
Sample Number				None Supplied	None Supplied
Depth (m)				1.30	1.40
Date Sampled				19/01/2024	19/01/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	6.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	7.8
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	40
Petroleum Hydrocarbons					
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	< 4.0	< 4.0
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	< 10

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Analytical Report Number: 24-79349
Project / Site name: Riverpark
Your Order No: 7227

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-PL 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
2934430	TP205	0.50	65	Loose Fibres	**Amosite**	< 0.001	**< 0.001**

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

Analytical Report Number: 24-79349
Project / Site name: Riverpark

Your Order No: 7227

Lab Sample Number				2934435
Sample Reference				TP/SA203
Sample Number				None Supplied
Depth (m)				0.30
Date Sampled				19/01/2024
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (automated)	pH Units	N/A	ISO 17025	11.4
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0
Total Phenols				
Total Phenols (monohydric)	µg/l	1	ISO 17025	1.2
Speciated PAHs				
Naphthalene	µg/l	0.01	NONE	< 0.01
Acenaphthylene	µg/l	0.01	NONE	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01
Fluorene	µg/l	0.01	NONE	< 0.01
Phenanthrene	µg/l	0.01	NONE	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01
Total PAH				
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2
Heavy Metals / Metalloids				
Arsenic (dissolved)	µg/l	1	ISO 17025	3.8
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	5.7
Copper (dissolved)	µg/l	0.7	ISO 17025	69
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.5
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.3
Monoaromatics & Oxygenates				
Benzene	µg/l	3	NONE	< 3.0
Toluene	µg/l	3	NONE	< 3.0
Ethylbenzene	µg/l	3	NONE	< 3.0
p & m-xylene	µg/l	3	NONE	< 3.0
o-xylene	µg/l	3	NONE	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10
Petroleum Hydrocarbons				
TPH1 (C10 - C40) EH_1D_TOTAL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	NONE	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	NONE	< 1.0

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Analytical Report Number: 24-79349
Project / Site name: Riverpark

Your Order No: 7227

Lab Sample Number				2934435
Sample Reference				TP/SA203
Sample Number				None Supplied
Depth (m)				0.30
Date Sampled				19/01/2024
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
TPH-CWG - Aliphatic >C8 - C10 $_{HS\_1D\_AL}$	µg/l	1	NONE	< 1.0
TPH-CWG - Aliphatic >C10 - C12 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35) $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C5 - C7 $_{HS\_1D\_AR}$	µg/l	1	NONE	< 1.0
TPH-CWG - Aromatic >C7 - C8 $_{HS\_1D\_AR}$	µg/l	1	NONE	< 1.0
TPH-CWG - Aromatic >C8 - C10 $_{HS\_1D\_AR}$	µg/l	1	NONE	< 1.0
TPH-CWG - Aromatic >C10 - C12 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C12 - C16 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C16 - C21 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C21 - C35 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35) $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10

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Analytical Report Number : 24-79349
Project / Site name: Riverpark

* 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 *
2934428	TP/SA203	None Supplied	0.3	Brown sand with gravel.
2934429	TP/SA203	None Supplied	0.6	Brown clay and sand with gravel.
2934430	TP205	None Supplied	0.5	Brown sand with gravel and brick.
2934431	TP207	None Supplied	0.9	Brown clay and sand with gravel.
2934432	TP209	None Supplied	0.2	Black sand with gravel and tar.
2934433	TP209	None Supplied	1.3	Brown clay and sand.
2934434	TP218	None Supplied	1.4	Brown clay and sand with gravel.

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Analytical Report Number : 24-79349
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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.	L038-PL	D	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
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
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
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

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Analytical Report Number : 24-79349
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total 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.	L009-PL	D	MCERTS
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted

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Analytical Report Number : 24-79349
Project / Site name: Riverpark

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
#2	EH_2D_Total but with fatty acids mathematically subtracted				
_	Operator - understore to separate acronyms (exception for +)				
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total				

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Analytical Report Number: 19-74137

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33964-EF

Lab Sample Number				1373906				
Sample Reference				WS123				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				22/11/2019				
Time Taken				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	9.4				
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				

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

Analytical Report Number: 19-74137

Project / Site name: Riverpark Trading Estate

Your Order No: 13492-33964-EF

Lab Sample Number				1373906				
Sample Reference				WS123				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				22/11/2019				
Time Taken				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				

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 19-74137

Project / Site name: Riverpark Trading Estate

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
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
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	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
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
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.

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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
WS101		W	19-74137	1373901	c	pH at 20oC in water (automated)	L099-PL	c
WS106		W	19-74137	1373902	c	pH at 20oC in water (automated)	L099-PL	c
WS112		W	19-74137	1373903	c	pH at 20oC in water (automated)	L099-PL	c
WS114		W	19-74137	1373904	c	pH at 20oC in water (automated)	L099-PL	c
WS117		W	19-74137	1373905	c	pH at 20oC in water (automated)	L099-PL	c
WS123		W	19-74137	1373906	c	pH at 20oC in water (automated)	L099-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

APPENDIX IX
GEOTECHNICAL TESTING RESULTS

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client e3p

Address Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contract Riverpark

Job Number MRN 24005/21
Date of Issue 21 February 2024

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

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

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

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

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
Email: enquiries@murrayrix.com Website: www.murrayrix.com

Also at: London: 020 8523 1999

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TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

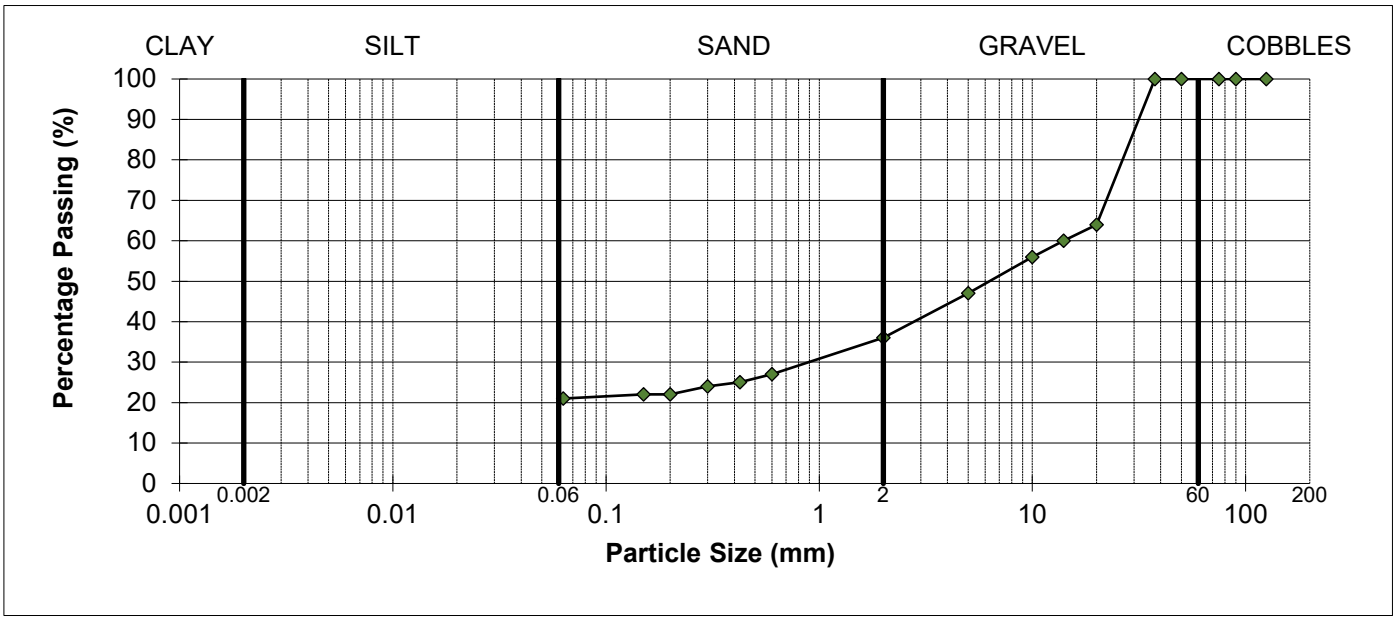
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	CP102 1.50m	DATE SAMPLED	Not Advised
LAB SAMPLE No	412001	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	Client

MATERIAL	Made Ground
ADVISED SOURCE	As client and site above

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100	100	5	47	
90	100		2	36	15-80
75	100		0.6	27	
50	100		0.425	25	
37.5	100		0.3	24	
20	64		0.2	22	
14	60		0.15	22	
10	56		0.063	21	15-80



SOIL FRACTIONS			
COBBLES	0%	SAND	15%
GRAVEL	64%	SILT / CLAY	21%

REMARKS

Sample complies with the advised grading specification for a 2C material (SHW 2016)

As received water content = 19.8%

SIGNED

NAME S.J. Hutchings (Director) DATE 21-Feb-24

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

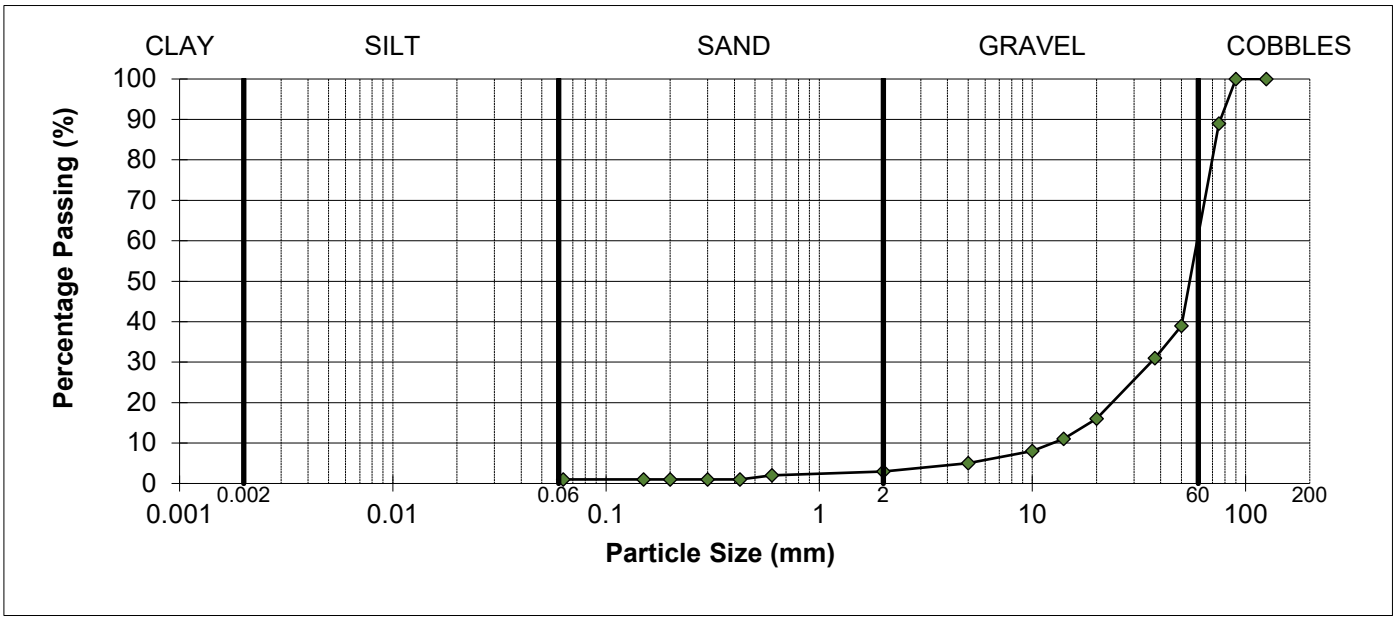
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	SA101 0.40m	DATE SAMPLED	Not Advised
LAB SAMPLE No	412002	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	Client

MATERIAL	Made Ground
ADVISED SOURCE	As client and site above

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100	100	5	5	
90	100		2	3	
75	89		0.6	2	
50	39		0.425	1	
37.5	31		0.3	1	
20	16		0.2	1	
14	11		0.15	1	
10	8		0.063	1	0-15



SOIL FRACTIONS			
COBBLES	36%	SAND	2%
GRAVEL	61%	SILT / CLAY	1%

REMARKS

Sample complies with the advised grading specification for a 1B material (SHW 2016), Uniformity coefficient = <10

As received water content = 16.5%

SIGNED

NAME S.J. Hutchings (Director) DATE 21-Feb-24

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

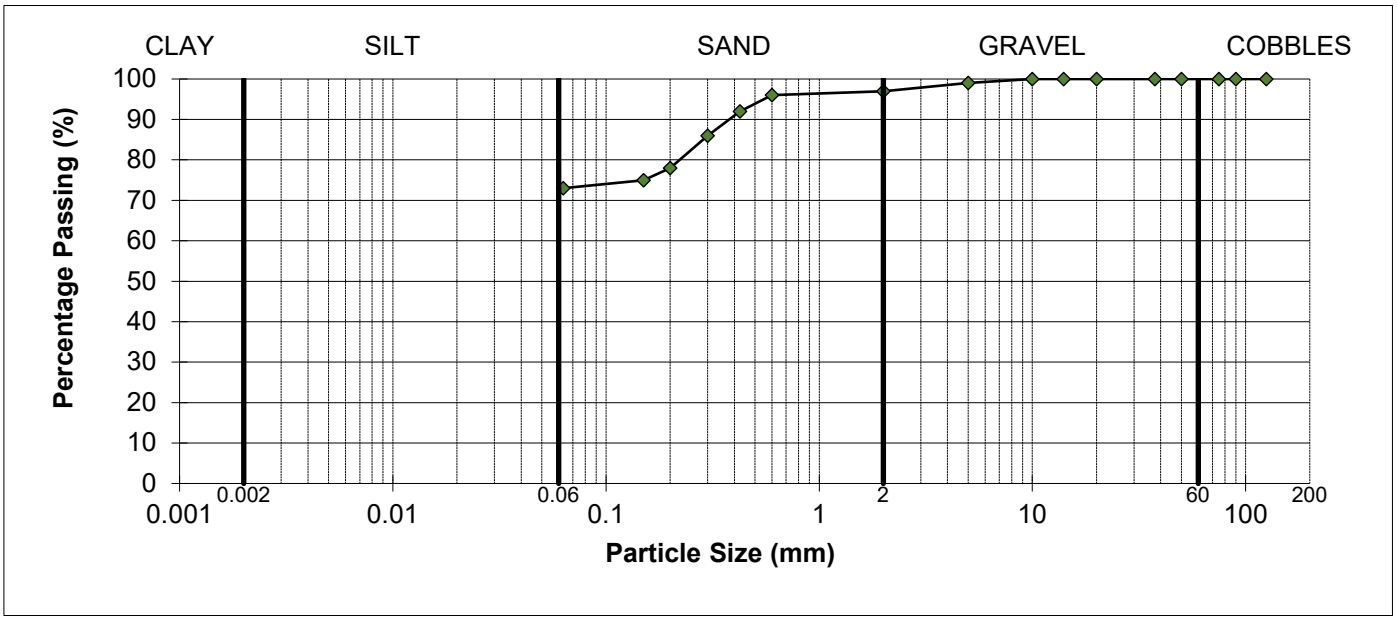
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	TP107 1.30m	DATE SAMPLED	Not Advised
LAB SAMPLE No	412003	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	As client and site above

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100	100	5	99	
90	100		2	97	80-100
75	100		0.6	96	
50	100		0.425	92	
37.5	100		0.3	86	
20	100		0.2	78	
14	100		0.15	75	
10	100		0.063	73	15-100



SOIL FRACTIONS			
COBBLES	0%	SAND	24%
GRAVEL	3%	SILT / CLAY	73%

REMARKS

Sample complies with the advised grading specification for a 2A/2B material (SHW 2016)

As received water content = 11.7%

SIGNED

NAME S.J. Hutchings (Director) DATE 21-Feb-24

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

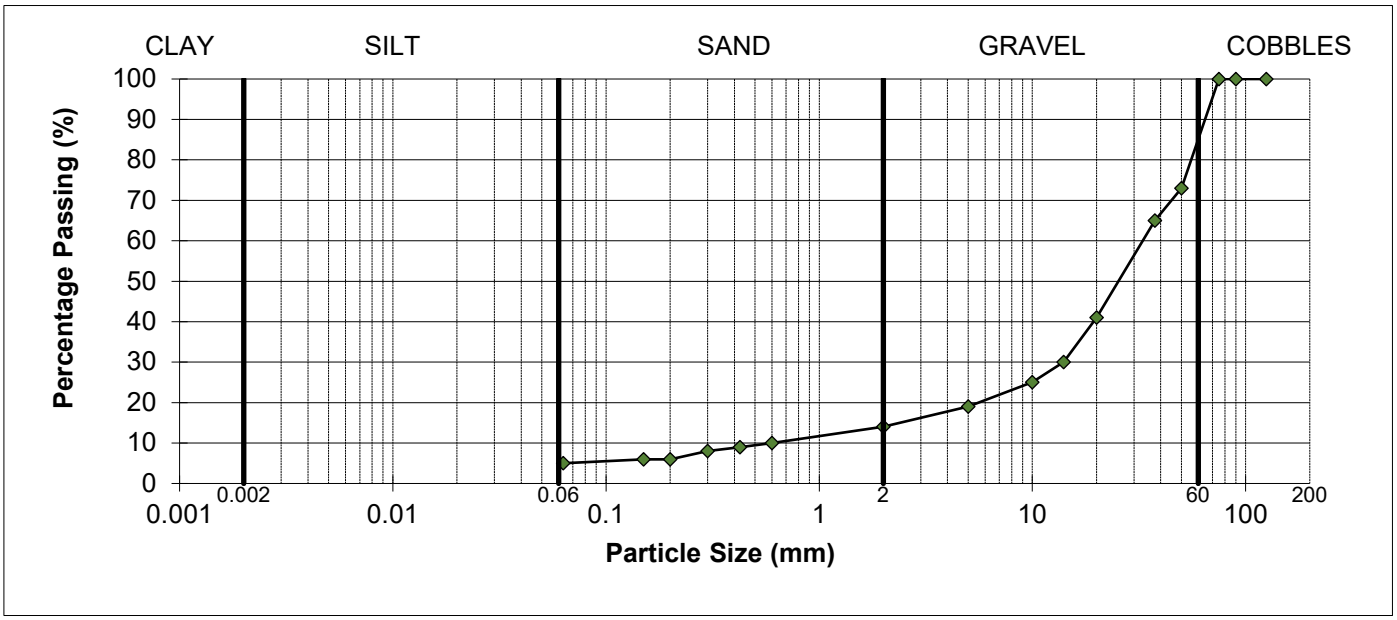
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	TP111 0.30m	DATE SAMPLED	Not Advised
LAB SAMPLE No	412004	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	Client

MATERIAL	Made Ground
ADVISED SOURCE	As client and site above

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100	100	5	19	
90	100		2	14	
75	100		0.6	10	
50	73		0.425	9	
37.5	65		0.3	8	
20	41		0.2	6	
14	30		0.15	6	
10	25		0.063	5	0-15



SOIL FRACTIONS			
COBBLES	14%	SAND	9%
GRAVEL	73%	SILT / CLAY	5%

REMARKS

Sample complies with the advised grading specification for a 1A material (SHW 2016), Uniformity coefficient = >10

As received water content = 11.6%

SIGNED

NAME S.J. Hutchings (Director) DATE 21-Feb-24

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TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

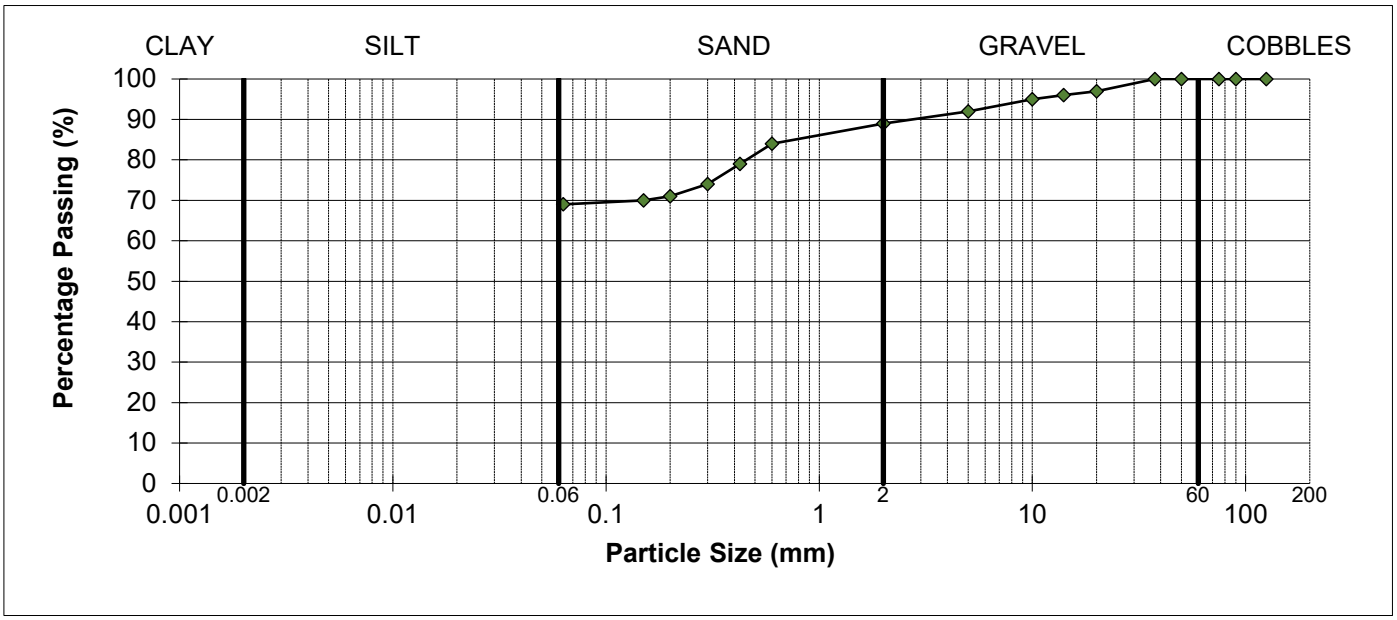
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	TP116 1.00m	DATE SAMPLED	Not Advised
LAB SAMPLE No	412005	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	Client

MATERIAL	Made Ground
ADVISED SOURCE	As client and site above

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100	100	5	92	
90	100		2	89	80-100
75	100		0.6	84	
50	100		0.425	79	
37.5	100		0.3	74	
20	97		0.2	71	
14	96		0.15	70	
10	95		0.063	69	15-100



SOIL FRACTIONS			
COBBLES	0%	SAND	20%
GRAVEL	11%	SILT / CLAY	69%

REMARKS
Sample complies with the advised grading specification for a 2A/2B material (SHW 2016)
As received water content = 19.8%

SIGNED

NAME S.J. Hutchings (Director) DATE 21-Feb-24

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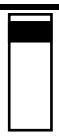
UKAS TESTING 1580

TEST CERTIFICATE

INCREMENTAL LOADING OEDOMETER TEST
BS EN ISO 17892-5:2017

CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	WS107 1.50-2.00	**DATE SAMPLED**	Not Advised
LAB SAMPLE No.	412008	**DATE RECEIVED**	24-Jan-24
DATE TESTED	12-Feb-24	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

Specimen Location 

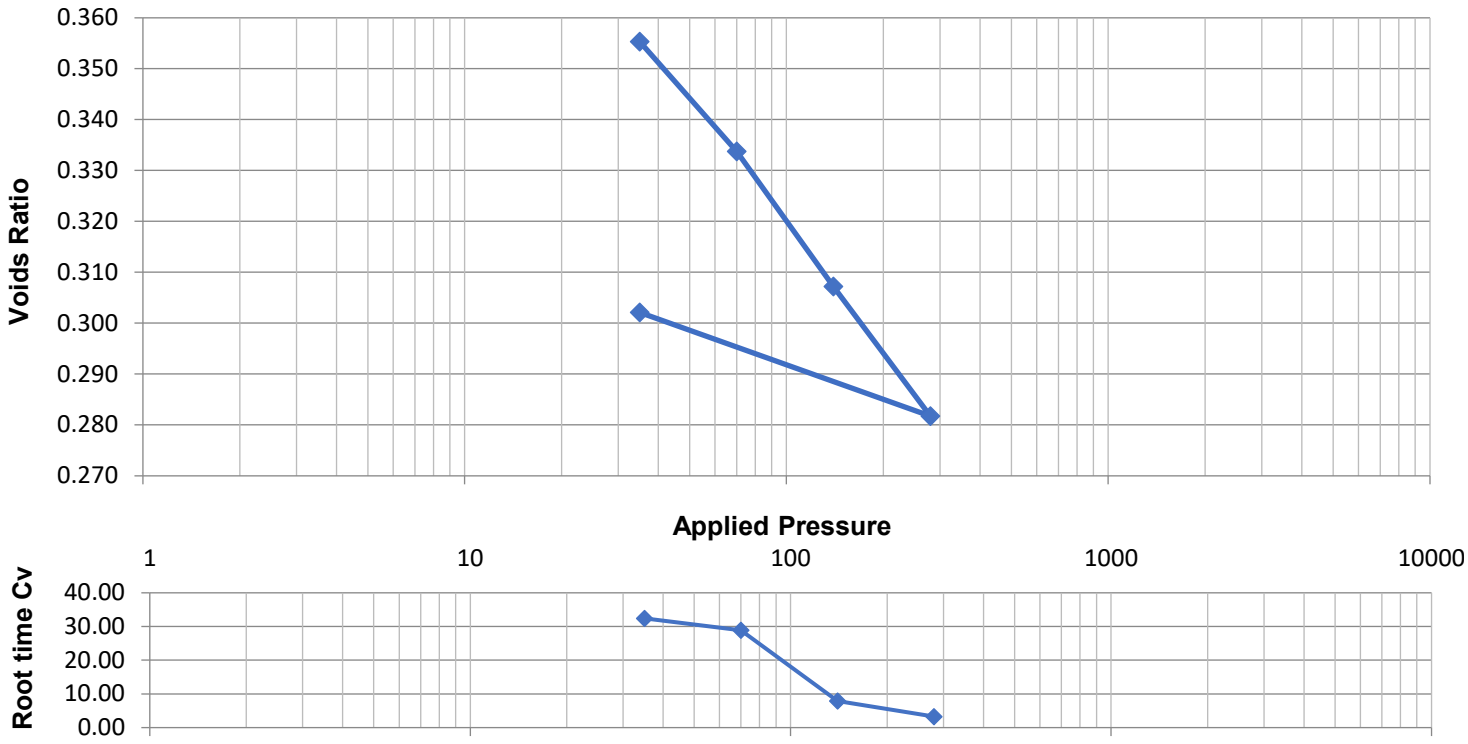
Sample Length (mm)	400	Specimen depth from top of Sample (mm)	10
Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS

Height	20.1	mm	Particle density	2.65	Ass
Diameter	70.1	mm	Initial void ratio	0.40	
Weight wet	164.3	g	Deg. of sat.	81	%
Water cont.*	12.1	%	Swell. press.	0	kN/m^2
Bulk Density	2.12	Mg/m^3	Dry density	1.90	Mg/m^3

*determined from specimen trimmings

Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m^2/MN	Temp °C	Cv t90 root m^2/yr	Cv t50 log m^2/yr
1	35	19.45	0.355	0.87	20	32.42	33.55
2	70	19.14	0.334	0.45	20	28.88	28.67
3	140	18.76	0.307	0.28	20	7.93	7.53
4	280	18.39	0.282	0.14	20	3.28	2.43
5	35	18.68	0.302	0.06	20		
6							
7							



Remarks/Abnormalities

Name S.J. Hutchings (Director) Signed Date 21 February 2024

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

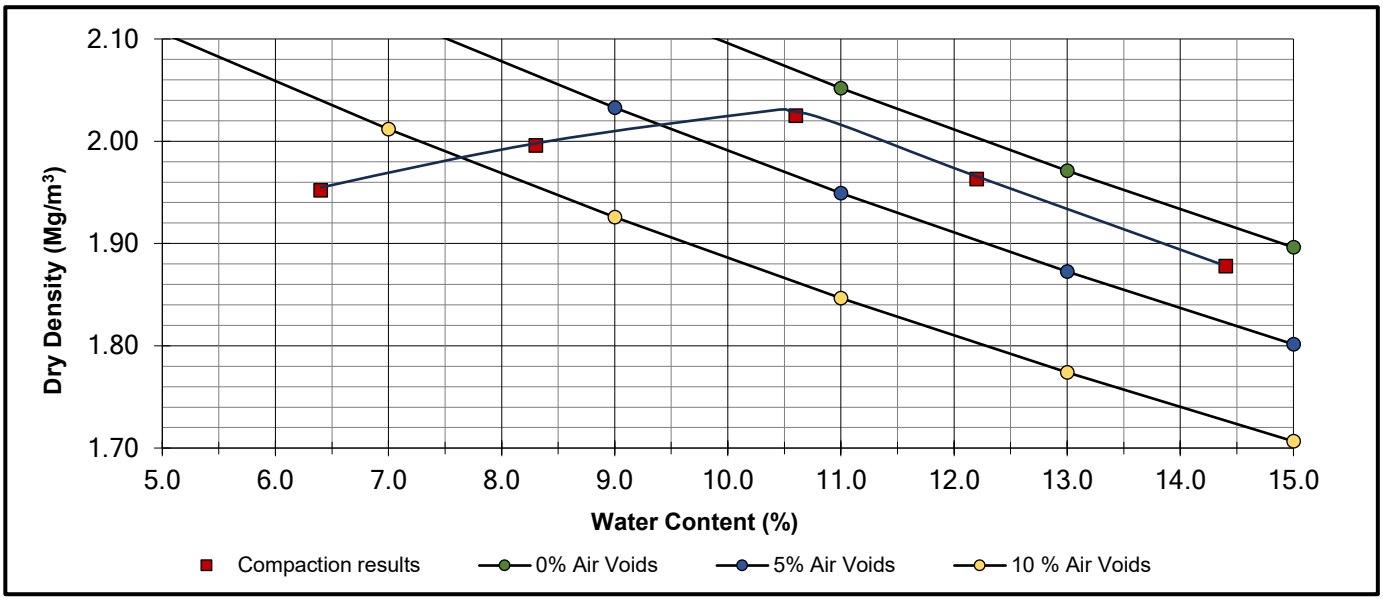
CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	TP107 1.30m	DATE SAMPLED	Not Advised
SAMPLE NUMBER	412003	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	As client and site above
PRE TREATMENT	Air Dried

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 1
RETAINED 20mm	0 %	PARTICLE DENSITY	2.65 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	6.4	1.952
2	8.3	1.996
3	10.6	2.025
4	12.2	1.963
5	14.4	1.878



OPTIMUM WATER CONTENT	**10**	(%)
MAXIMUM DRY DENSITY	**2.03**	(Mg/m^3)

REMARKS

NAME S.J. Hutchings (Director) SIGNED DATE 21-Feb-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

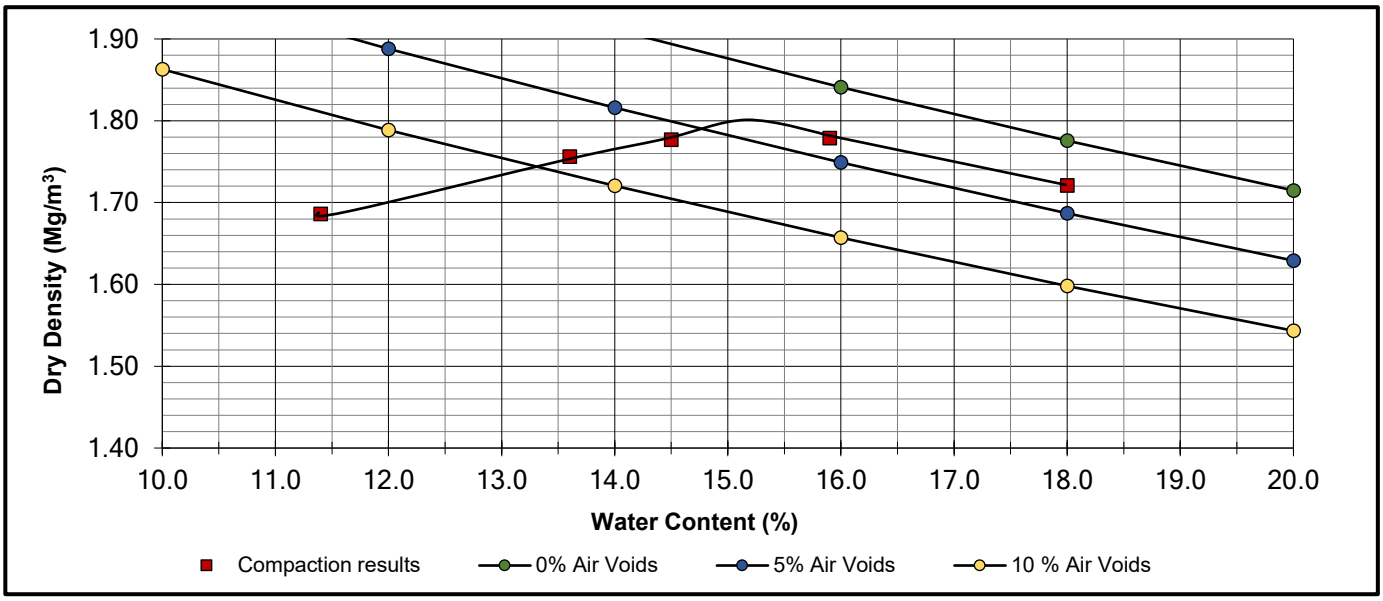
CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	TP116 1.00m	DATE SAMPLED	Not Advised
SAMPLE NUMBER	412005	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	

MATERIAL	Made Ground
ADVISED SOURCE	As client and site above
PRE TREATMENT	Air Dried

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	3 %	PARTICLE DENSITY	2.61 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	11.4	1.686
2	13.6	1.756
3	14.5	1.777
4	15.9	1.779
5	18.0	1.721



OPTIMUM WATER CONTENT	**15**	(%)
MAXIMUM DRY DENSITY	**1.80**	(Mg/m^3)

REMARKS

NAME S.J. Hutchings (Director) SIGNED DATE 21-Feb-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS EN ISO 17892-8:2018

CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

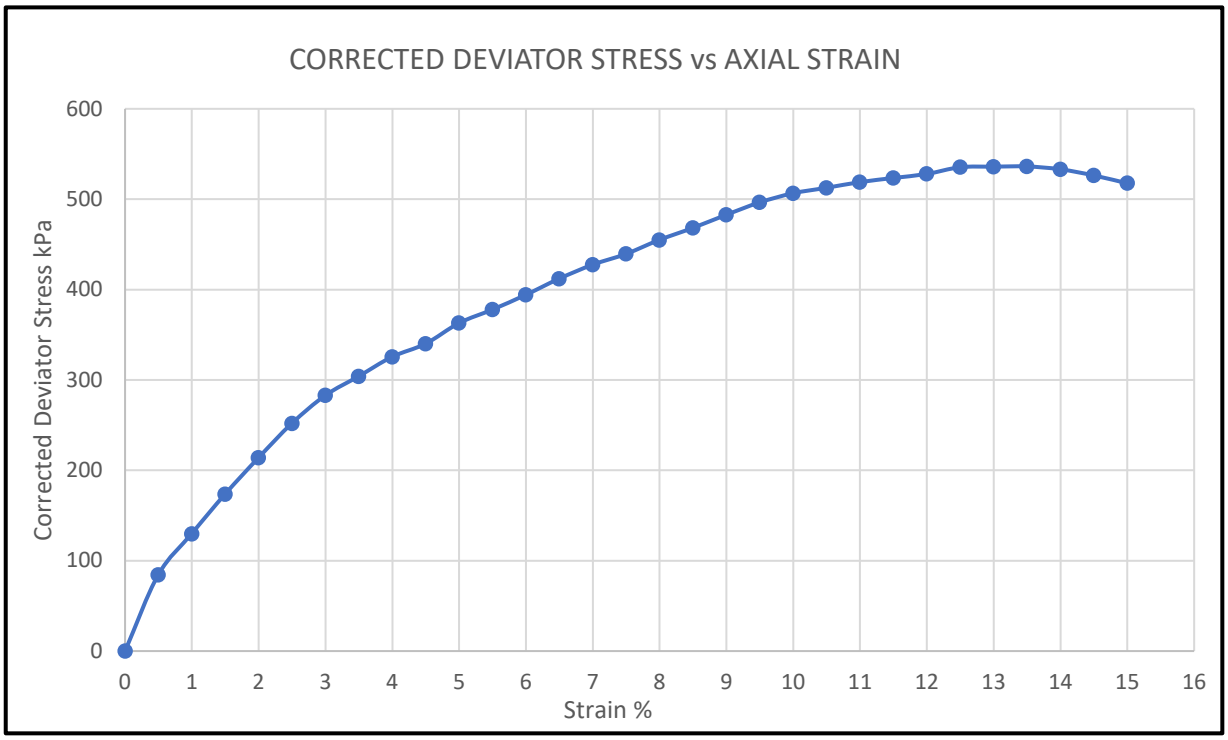
SAMPLE LABEL	WS102 1.50-2.00	**DATE SAMPLED**	Not Advised
LAB SAMPLE No.	412006	**DATE RECEIVED**	24-Jan-24
DATE TESTED	25-Jan-24	**SAMPLED BY**	Client
MATERIAL	Brown silty CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

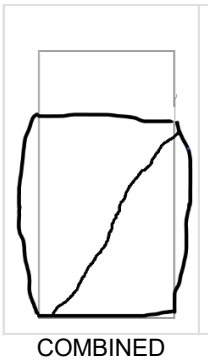


Sample Length (mm)	450	Specimen depth from top of Sample (mm)	150
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	143	Specimen Water Content (%)	11.5
Specimen Diameter (mm)	72	Specimen Bulk Density (Mg/m3)	2.08
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.87
Membrane Correction	3.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



COMBINED

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
35	13.5	2.0	536	268

Remarks/Abnormalities

Name S.J. Hutchings (Director) Signed Date 21 February 2024

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS EN ISO 17892-8:2018

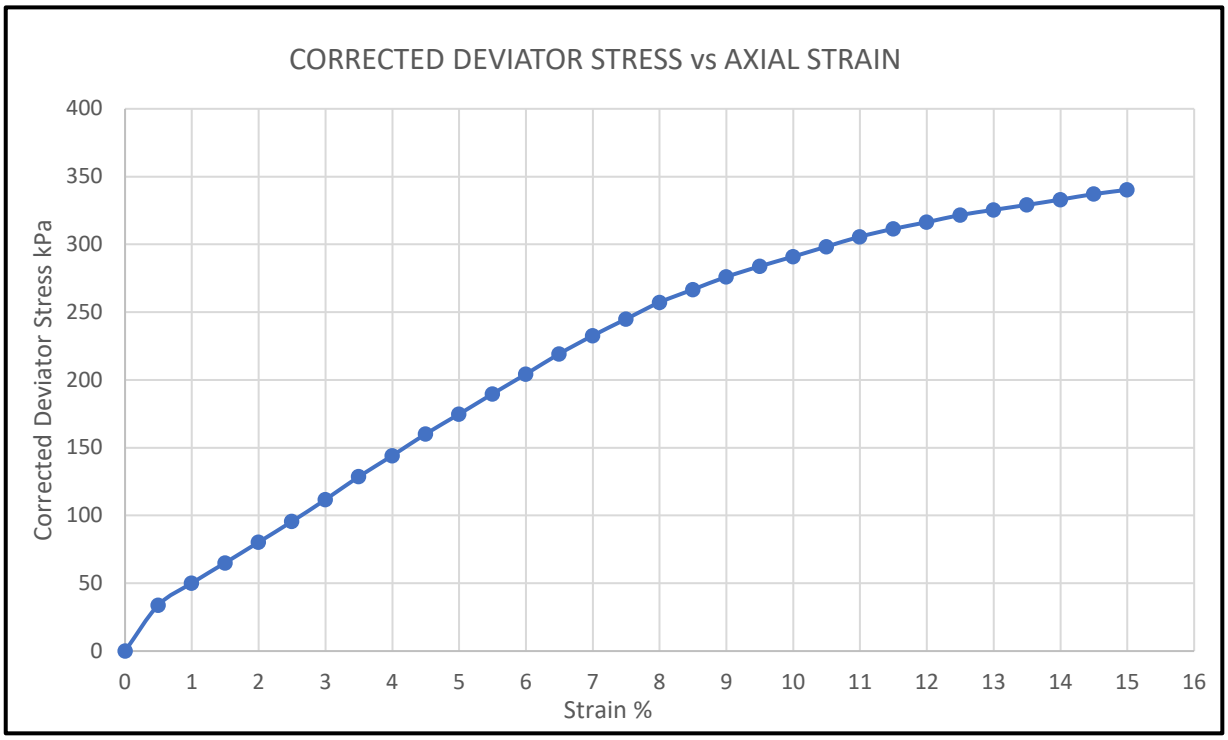
CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	WS105 3.50-4.00m	**DATE SAMPLED**	Not Advised
LAB SAMPLE No.	412007	**DATE RECEIVED**	24-Jan-24
DATE TESTED	25-Jan-24	**SAMPLED BY**	Client
MATERIAL	Brown silty CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

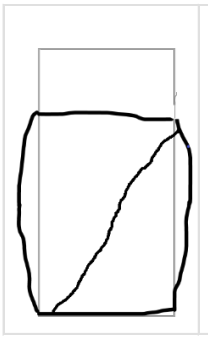
Specimen Location 

Sample Length (mm)	450	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	141	Specimen Water Content (%)	14.7
Specimen Diameter (mm)	72	Specimen Bulk Density (Mg/m3)	2.15
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.87
Membrane Correction	3.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



COMBINED

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
75	15.0	2.0	340	170

Remarks/Abnormalities

Name S.J. Hutchings (Director) Signed Date 21 February 2024

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

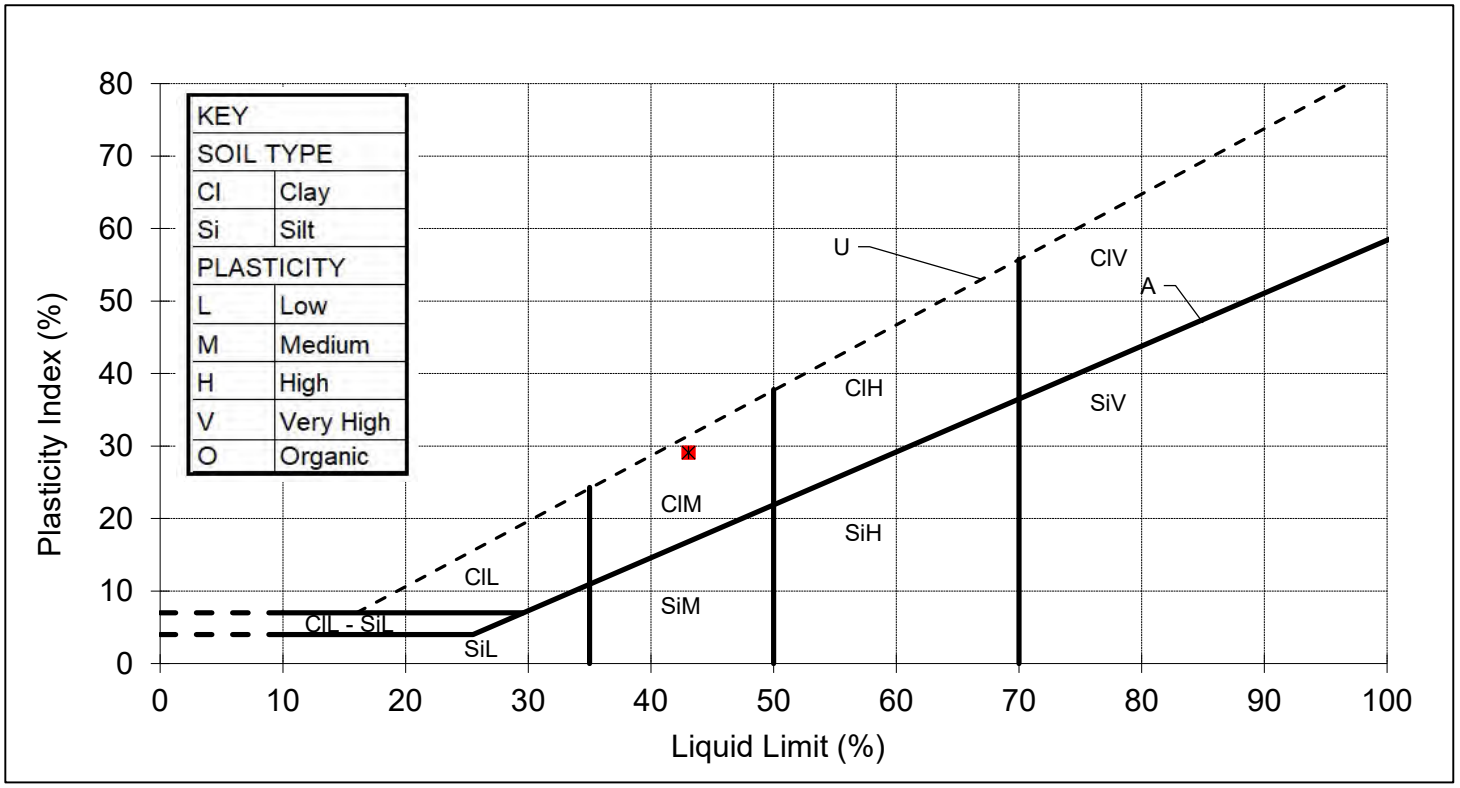
CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	WS101 1.00-1.45m	DATE SAMPLED	Not Advised
SAMPLE No.	412009	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	Client

MATERIAL	Brown slightly silty CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.2	42.8	1.016	
Determination 2 (avg)	19.2	42.0		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
18.1	43	14	29	100



REMARKS

SIGNED

NAME S.J. Hutchings (Director) DATE 21-Feb-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

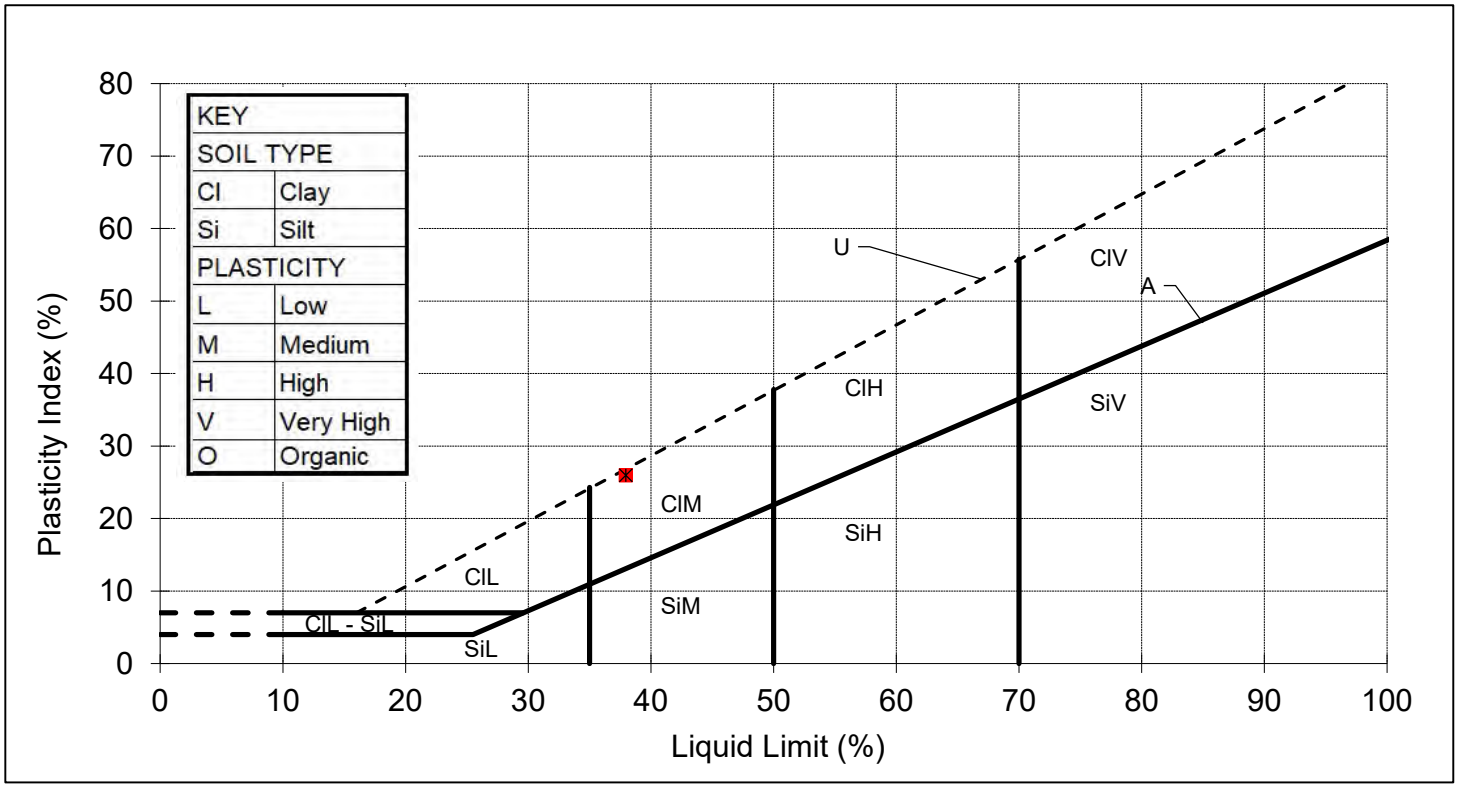
CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	WS110 2.00-2.45m	DATE SAMPLED	Not Advised
SAMPLE No.	412010	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.3	38.2	0.995	
Determination 2 (avg)	20.4	38.1		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
14.0	38	12	26	91



REMARKS

SIGNED

NAME S.J. Hutchings (Director) DATE 21-Feb-24

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

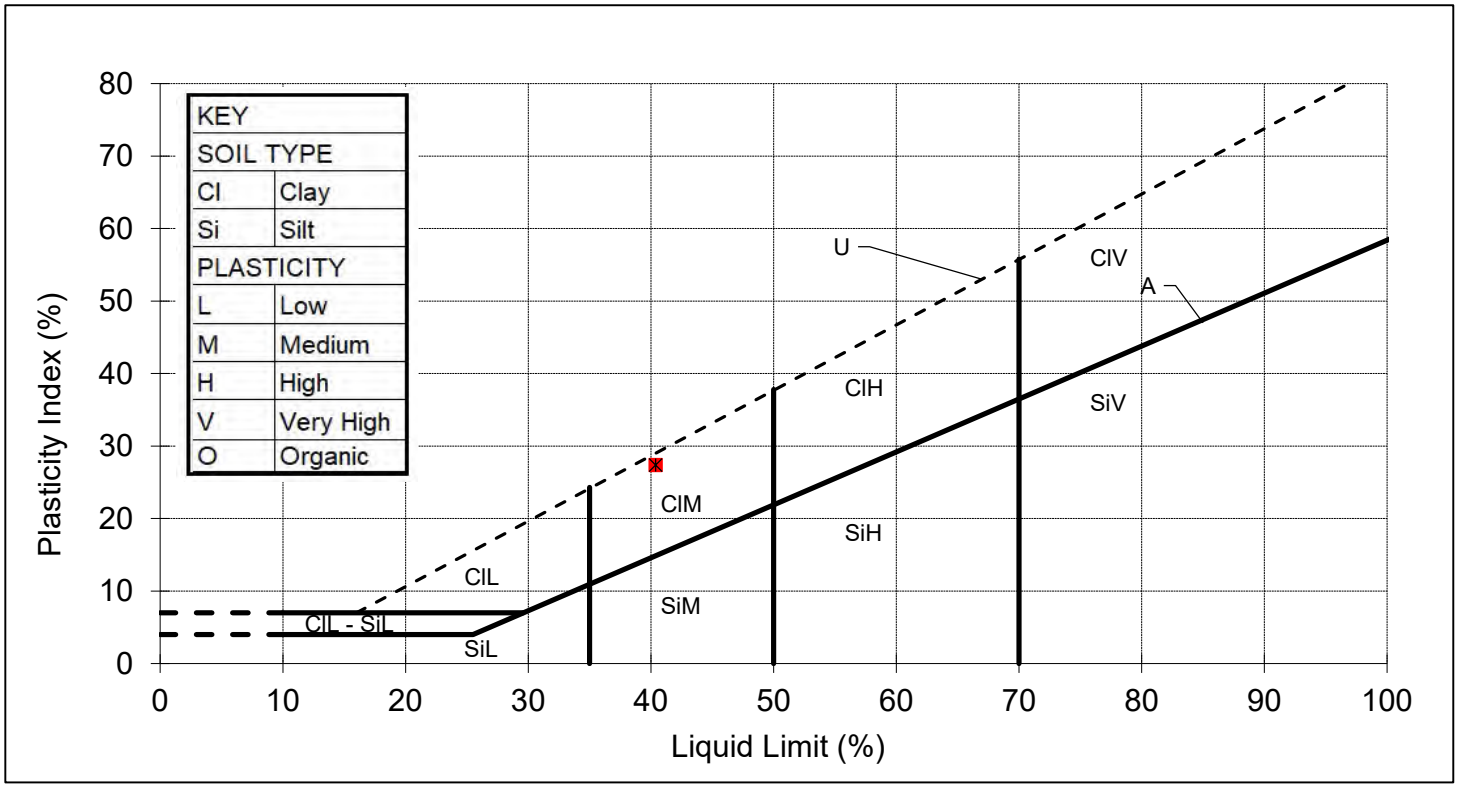
CLIENT	e3p
SITE	Riverpark
JOB NUMBER	MRN 24005/21

SAMPLE LABEL	CP101 1.00-1.45	DATE SAMPLED	Not Advised
SAMPLE No.	412011	DATE RECEIVED	24-Jan-24
DATE TESTED	29-Jan-24	SAMPLED BY	Client

MATERIAL	Brown silty CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.7	40.1	1.006	
Determination 2 (avg)	19.7	40.2		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
15.4	40	13	27	100



REMARKS

SIGNED

NAME S.J. Hutchings (Director) DATE 21-Feb-24

LABORATORY REPORT

4043

Contract Number: PSL19/6919

Report Date: 16 December 2019

Client's Reference: 13-492-EF-33568

Client Name: E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

For the attention of: Elizabeth Fearn

Contract Title: Riverpark

Date Received: 13/11/2019
Date Commenced: 13/11/2019
Date Completed: 16/12/2019

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)	A Watkins (Director)	R Berriman (Quality Manager)
S Royle (Laboratory Manager)	S Eyre (Senior Technician)	L Knight (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
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e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP102		B	0.50		MADE GROUND dark brown very sandy silty gravel with cobbles.
TP105		B	1.00		MADE GROUND brown slightly gravelly very sandy clay.
TP106		B	1.00		MADE GROUND brown gravelly very sandy clay.
TP110		B	0.40		MADE GROUND dark brown very sandy silty gravel with some cobbles.
WS103		U	1.50	2.00	Very stiff reddish brown slightly gravelly very sandy CLAY.
WS106		U	0.50	1.00	Brown slightly gravelly very sandy CLAY.
WS112		U	1.00	1.60	Stiff brown slightly gravelly very sandy CLAY.
WS114		U	1.50	2.00	Brown slightly gravelly very sandy CLAY.
WS117		U	2.50	3.00	Stiff brown slightly gravelly very sandy CLAY.
WS121		U	1.00	1.50	Brown slightly gravelly very sandy CLAY.
WS102		D	1.00	1.45	Brown slightly gravelly very sandy CLAY.
WS107		D	1.00	1.45	Brown slightly gravelly very sandy CLAY.
WS109		D	2.00	2.45	Brown slightly gravelly very sandy CLAY.
WS114		D	1.00	1.45	Brown slightly gravelly very sandy CLAY.
WS117		D	2.00	2.45	Brown slightly gravelly very sandy CLAY.
WS118		D	2.00	2.45	Brown slightly gravelly very sandy CLAY.
WS123		D	1.00	1.45	Brown slightly gravelly very sandy CLAY.
WS125		D	2.00	2.45	Brown slightly gravelly very sandy CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS102		D	1.00	1.45	17			38	18	20	89	Intermediate plasticity CI.
WS107		D	1.00	1.45	17			35	17	18	91	Intermediate plasticity CI.
WS109		D	2.00	2.45	19			40	19	21	94	Intermediate plasticity CI.
WS114		D	1.00	1.45	21			36	18	18	95	Intermediate plasticity CI.
WS117		D	2.00	2.45	17			37	18	19	92	Intermediate plasticity CI.
WS118		D	2.00	2.45	17			39	19	20	90	Intermediate plasticity CI.
WS123		D	1.00	1.45	17			38	17	21	94	Intermediate plasticity CI.
WS125		D	2.00	2.45	16			39	18	21	88	Intermediate plasticity CI.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Riverpark

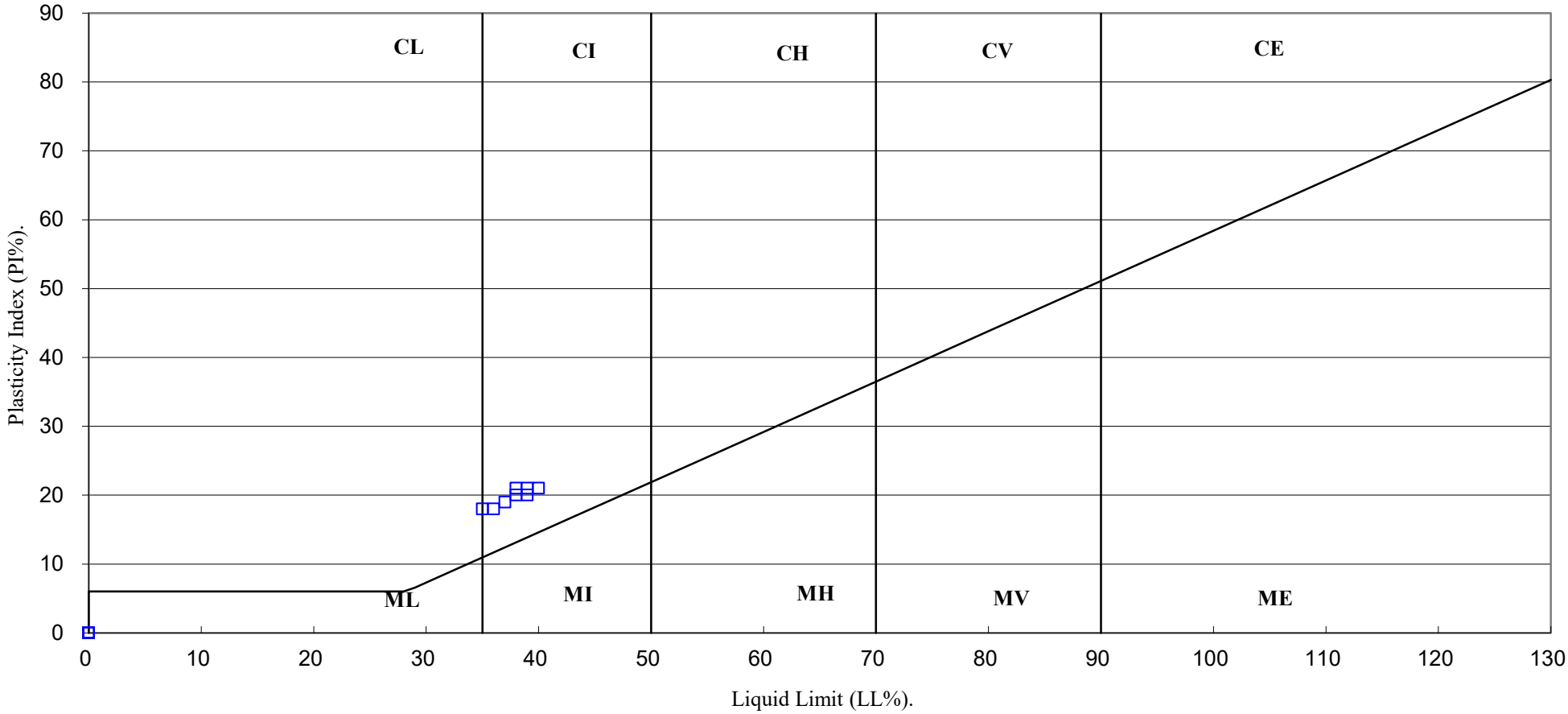
Contract No:

PSL19/6919

Client Ref:

13-492-EF-33568

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Riverpark	Contract No: PSL19/6919 Client Ref: 13-492-EF-33568

PARTICLE SIZE DISTRIBUTION TEST

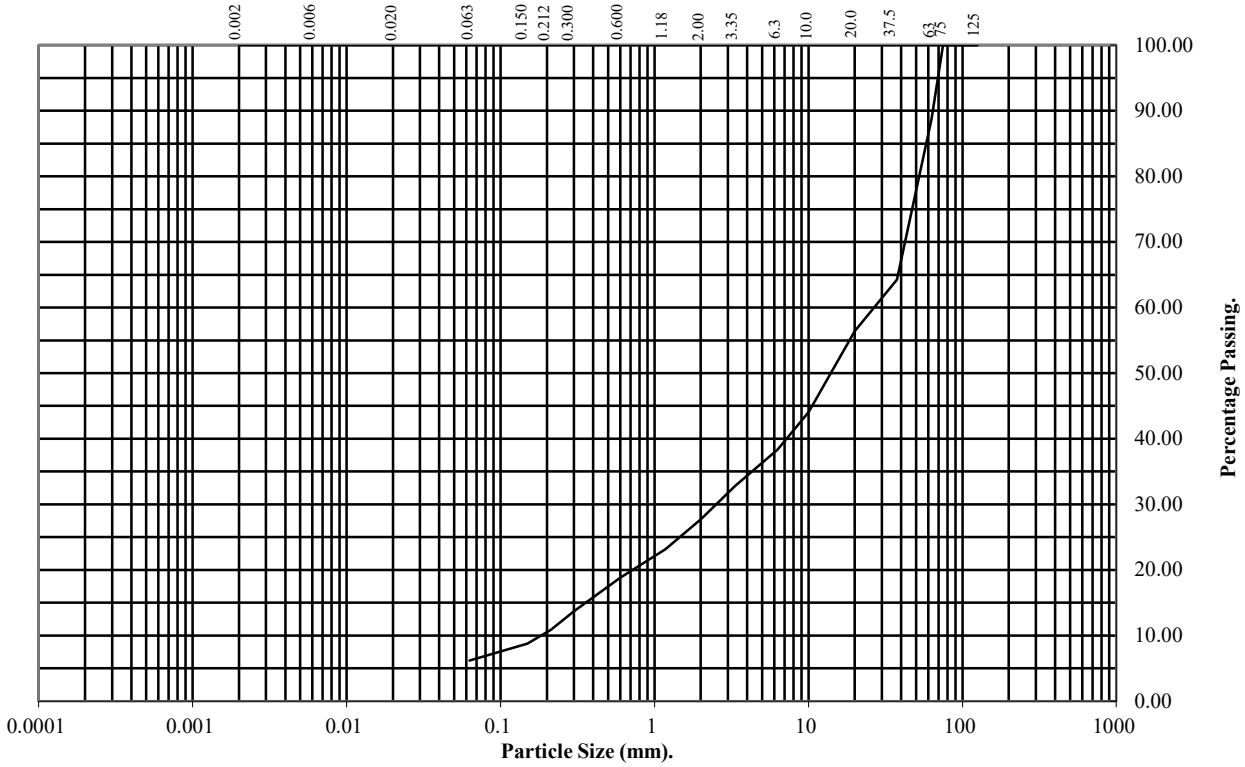
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP102 **Top Depth (m):** 0.50

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	89
37.5	64
20	56
10	44
6.3	38
3.35	33
2	28
1.18	23
0.6	19
0.3	14
0.212	11
0.15	9
0.063	6

Soil Fraction	Total Percentage
Cobbles	11
Gravel	61
Sand	22
Silt/Clay	6

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

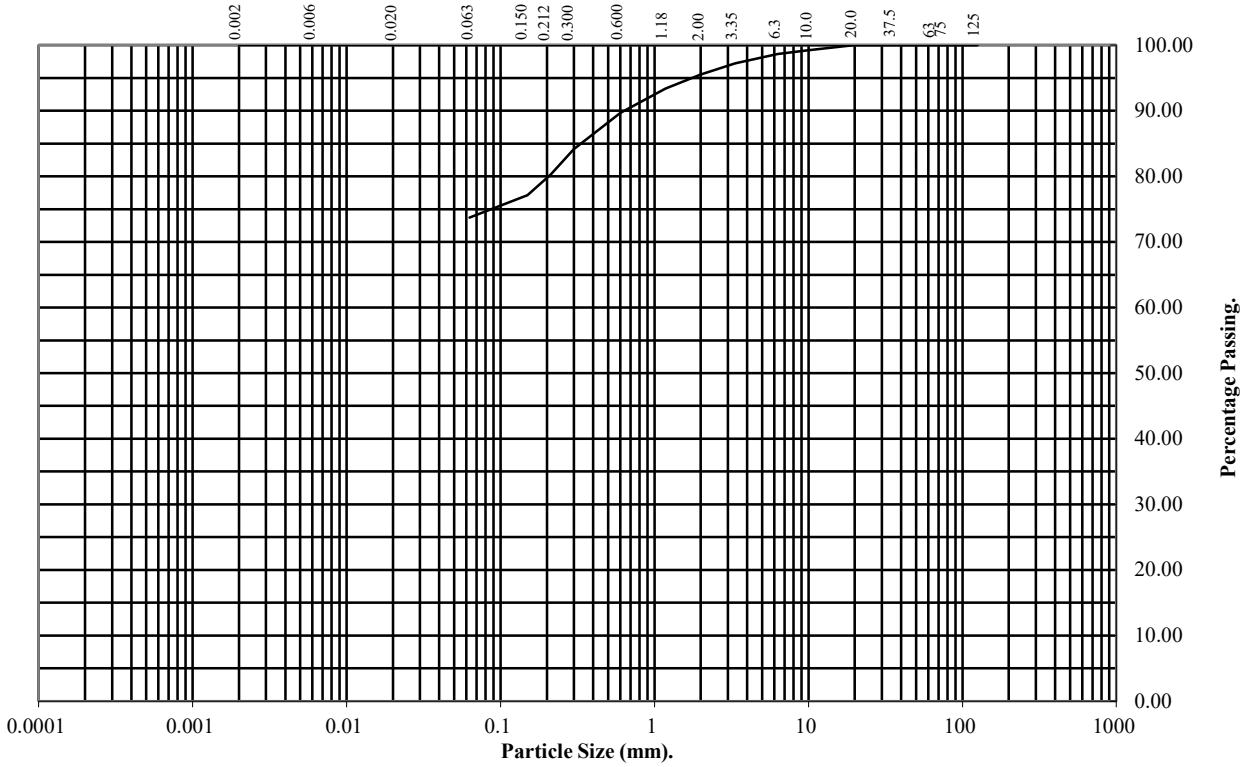
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP105 **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	99
3.35	97
2	96
1.18	93
0.6	90
0.3	84
0.212	80
0.15	77
0.063	74

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	22
Silt/Clay	74

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

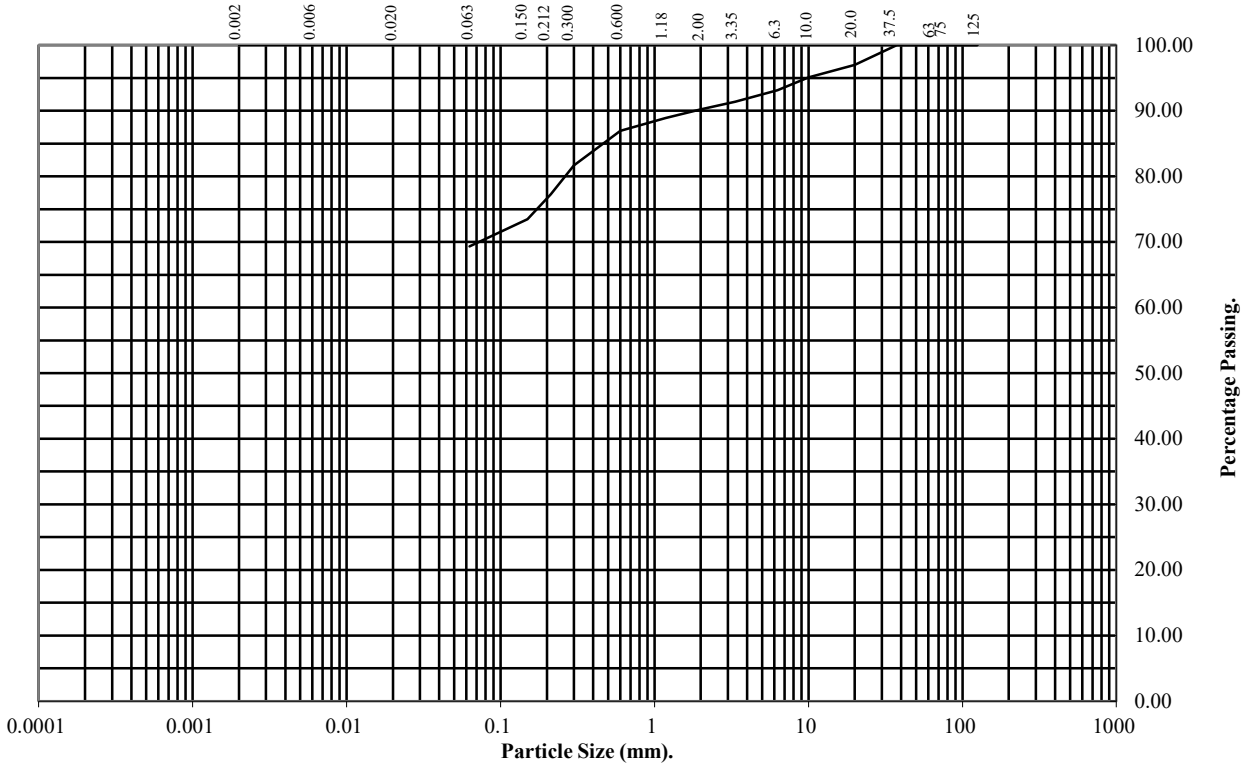
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP106 **Top Depth (m):** 1.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	95
6.3	93
3.35	91
2	90
1.18	89
0.6	87
0.3	82
0.212	77
0.15	73
0.063	69

Soil Fraction	Total Percentage
Cobbles	0
Gravel	10
Sand	21
Silt/Clay	69

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

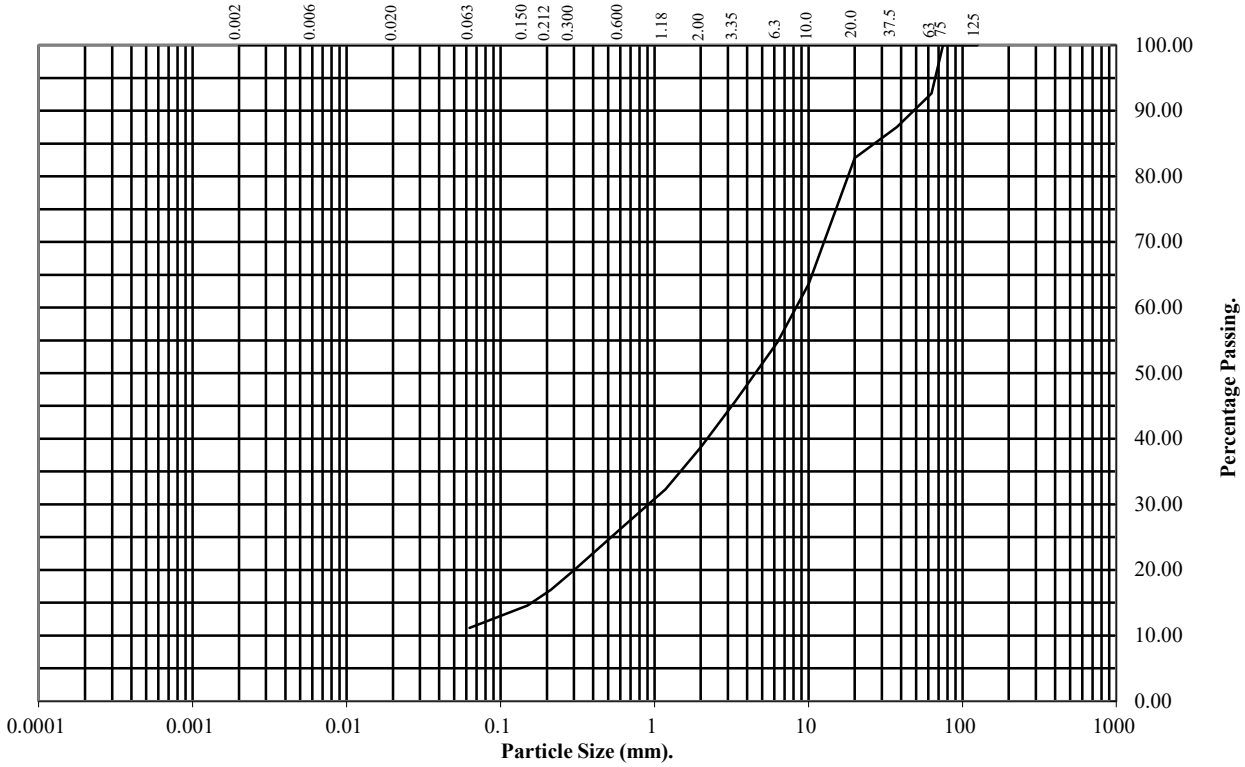
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP10 **Top Depth (m):** 0.40

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	93
37.5	88
20	83
10	64
6.3	55
3.35	46
2	39
1.18	32
0.6	26
0.3	20
0.212	17
0.15	15
0.063	11

Soil Fraction	Total Percentage
Cobbles	7
Gravel	54
Sand	28
Silt/Clay	11

Remarks:

See Summary of Soil Descriptions

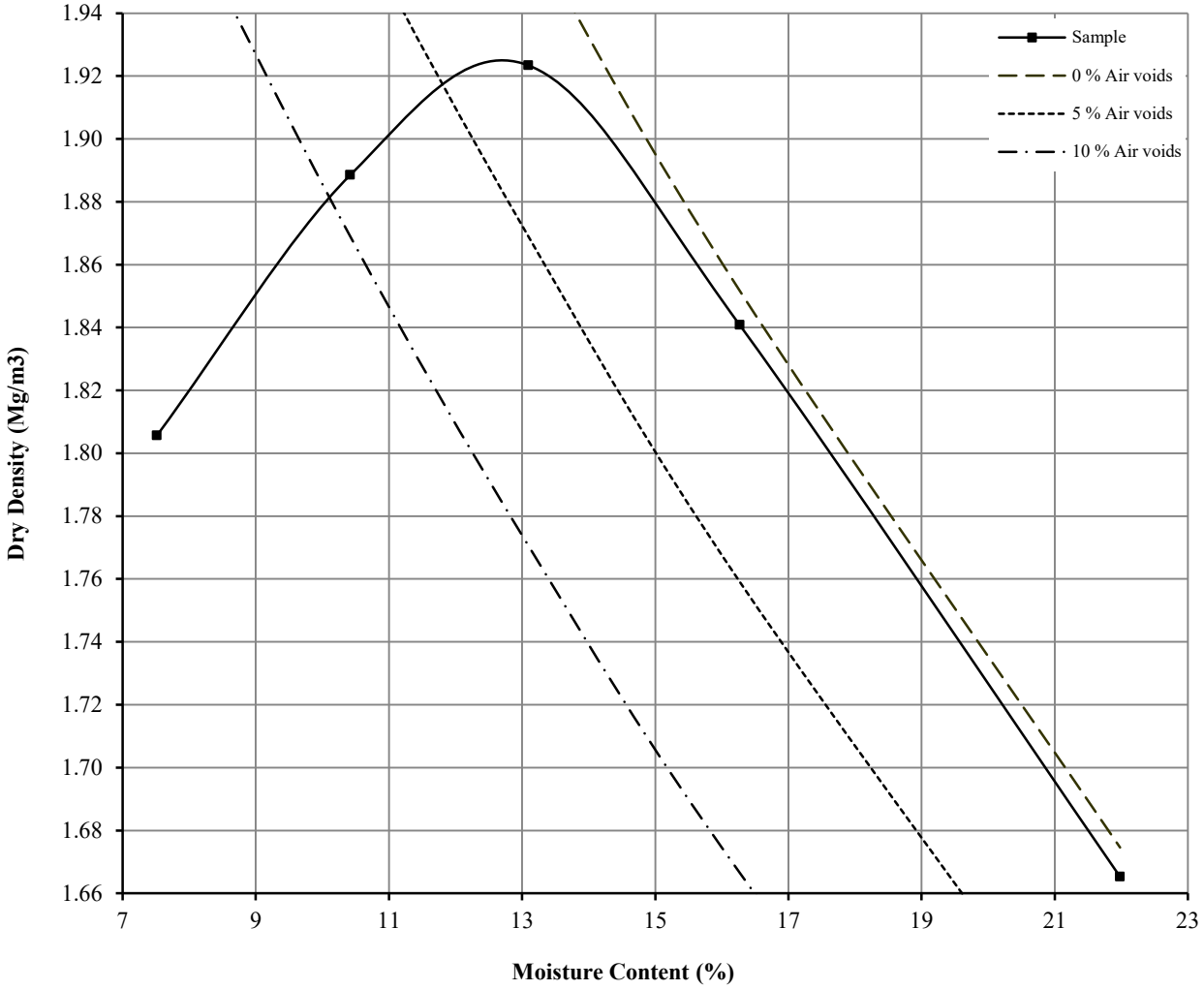
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

Hole Number: TP105 **Top Depth (m) :** 1.00

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		22	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.92	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions.					

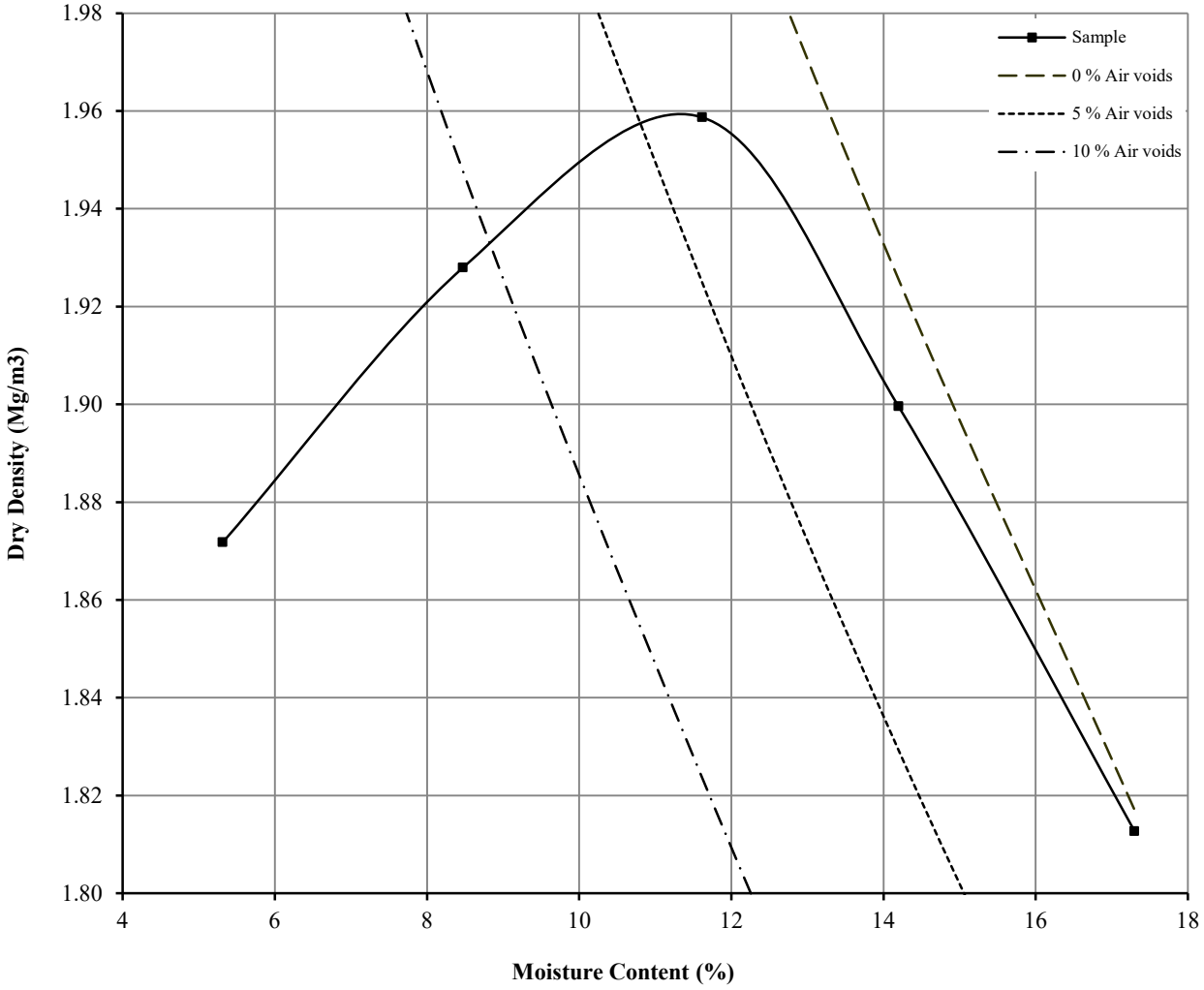
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

Hole Number: TP106 **Top Depth (m) :** 1.00

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		17	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.96	Material Retained on 20.0 mm Test Sieve (%):		3
Optimum Moisture Content (%):		12			
Remarks See summary of soil descriptions.					

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

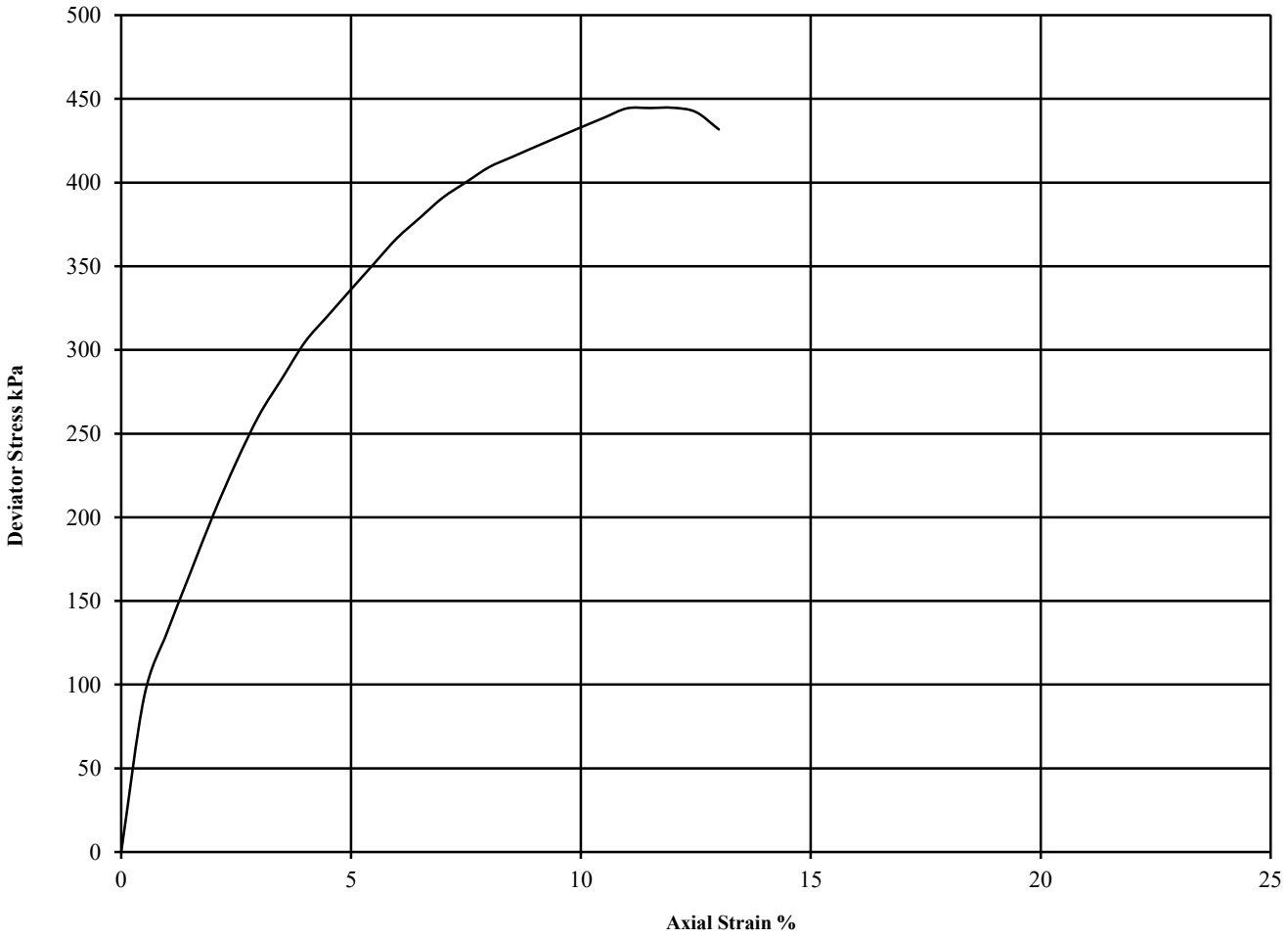
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: WS103 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):** 2.00

Sample Type U



Diameter (mm):		62	Height (mm):		124	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.55
1	13	2.20	1.95	35	445	222	12.0	Brittle	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Riverpark

Contract No: PSL19/6919

Client Ref: 13-492-EF-33568

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

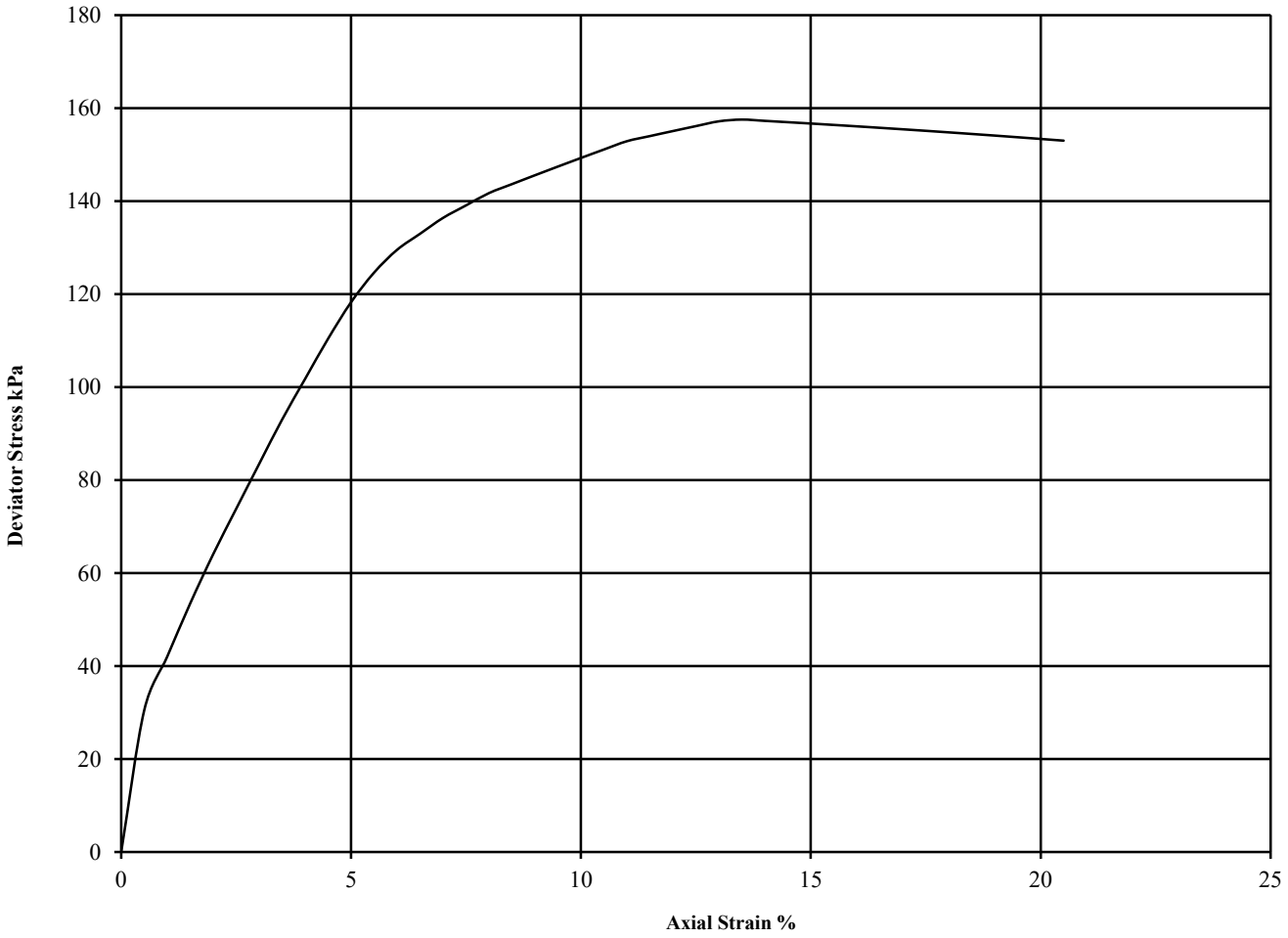
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: WS112 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):** 1.60

Sample Type U



Diameter (mm):		83	Height (mm):		166	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.42
1	19	1.96	1.65	26	158	79	13.5	Plastic	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Riverpark

Contract No: PSL19/6919

Client Ref: 13-492-EF-33568

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

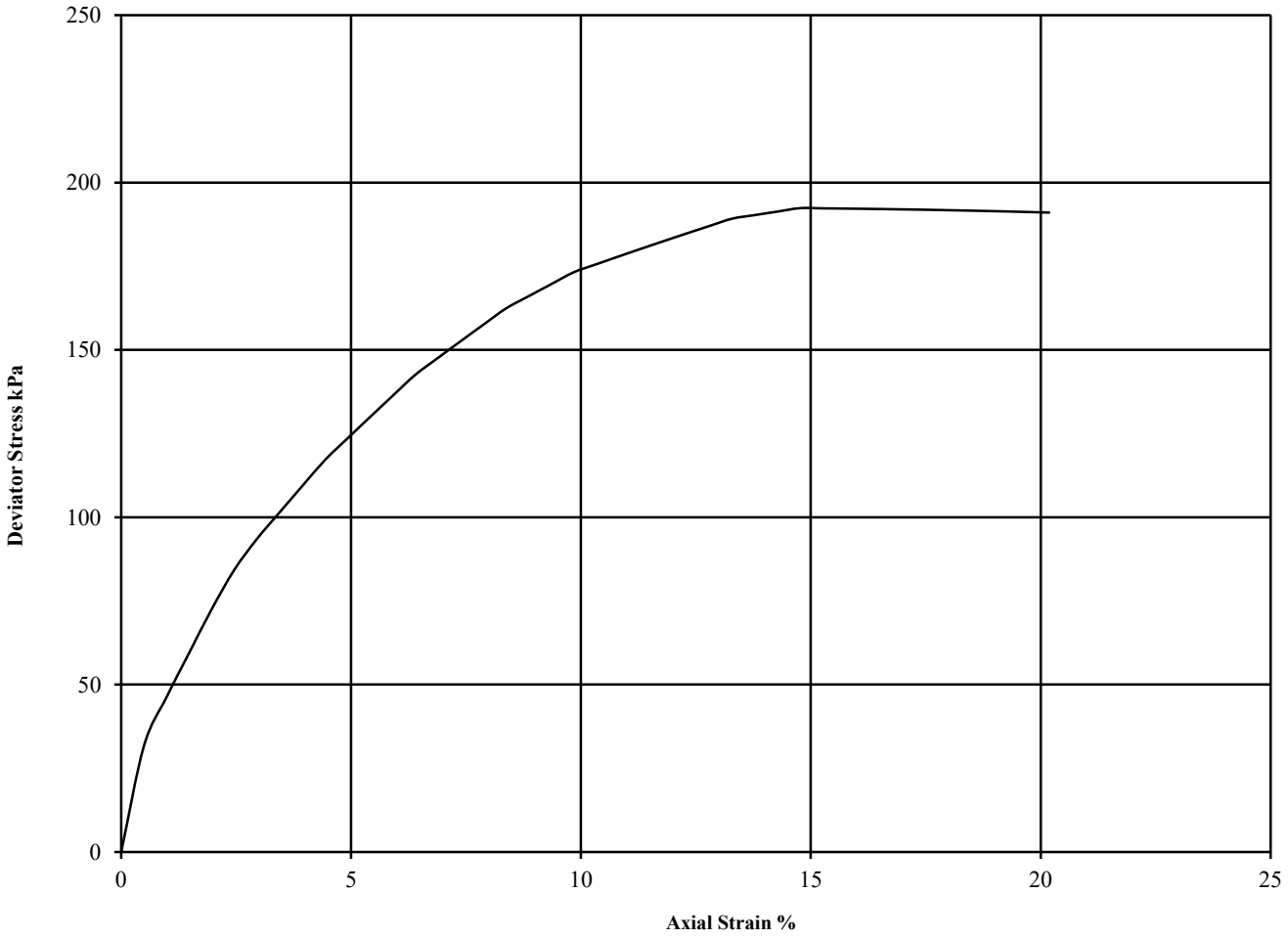
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: WS117 **Top Depth (m):** 2.50

Sample Number: **Base Depth (m):** 3.00

Sample Type U



Diameter (mm):		64	Height (mm):		130	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.52
1	17	2.17	1.86	55	192	96	14.8	Plastic	See summary of soil descriptions

UKAS TESTING 4043

PSL Professional Soils Laboratory

Riverpark

Contract No: PSL19/6919

Client Ref: 13-492-EF-33568

ONE DIMENSIONAL CONSOLIDATION TEST

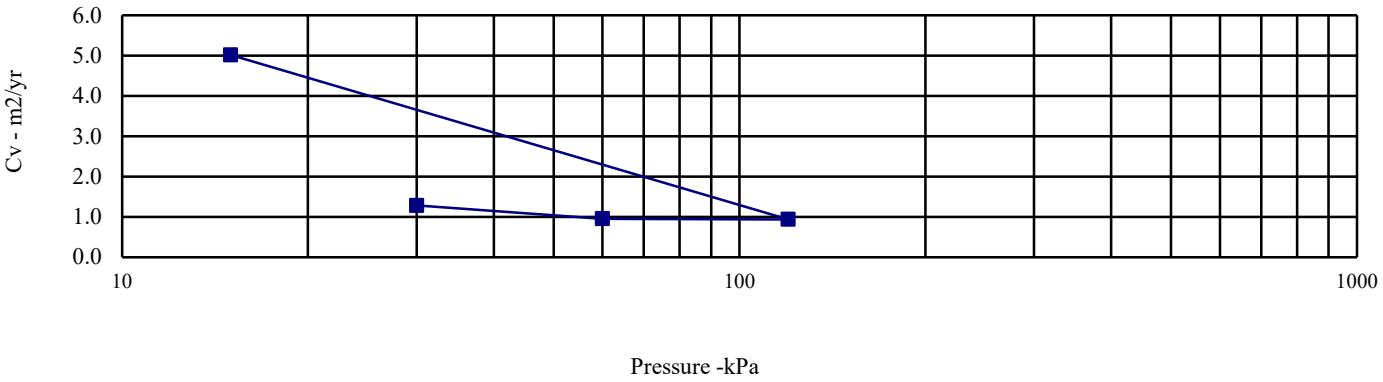
BS 1377: Part 5: 1990: Clause 3

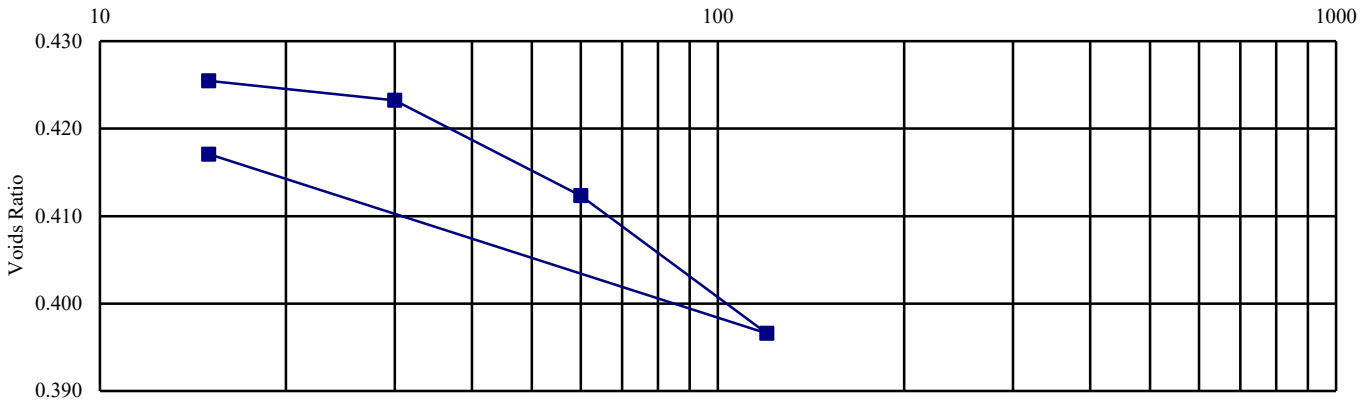
Hole Number: **WS106** **Top Depth (m):** **0.50**

Sample Number: **Base Depth (m) :** **1.00**

Sample Type: **Liner**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	16						
Bulk Density (Mg/m3):	2.16	0	15	Swelling	Swelling	Method used to	
Dry Density (Mg/m3):	1.86	15	30	0.104	1.283	determine CV:	T90
Voids Ratio:	0.425	30	60	0.255	0.952	Nominal temperature	
Degree of saturation:	101.5	60	120	0.186	0.935	during test ' C:	20
Height (mm):	19.886	120	15	0.140	5.013	Remarks:	
Diameter (mm)	75.015					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Riverpark**	**Contract No:** PSL19/6919 **Client Ref:** 13-492-EF-33568

ONE DIMENSIONAL CONSOLIDATION TEST

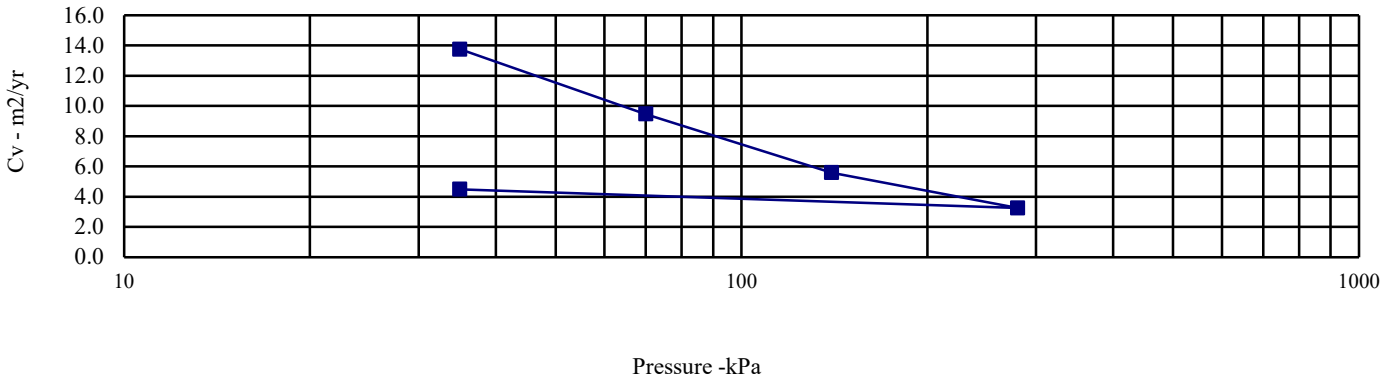
BS 1377: Part 5: 1990: Clause 3

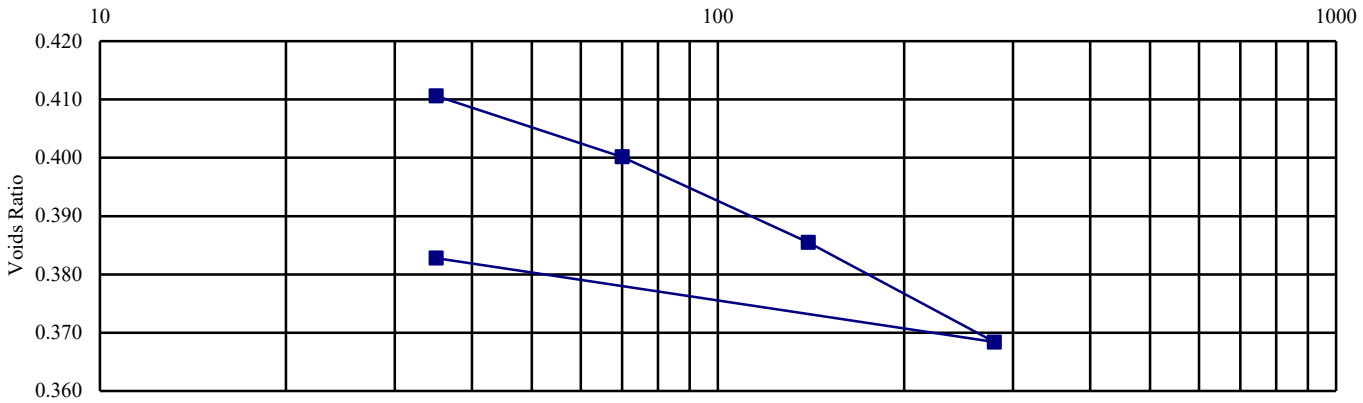
Hole Number: **WS114** **Top Depth (m):** **1.50**

Sample Number: **Base Depth (m) :** **2.00**

Sample Type: **Liner**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	15						
Bulk Density (Mg/m3):	2.15	0	35	0.172	13.744	Method used to	
Dry Density (Mg/m3):	1.87	35	70	0.212	9.464	determine CV:	T90
Voids Ratio:	0.419	70	140	0.150	5.592	Nominal temperature	
Degree of saturation:	96.1	140	280	0.088	3.245	during test ' C:	20
Height (mm):	19.922	280	35	0.043	4.483	Remarks:	
Diameter (mm)	75.015					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Riverpark**	**Contract No:** PSL19/6919 **Client Ref:** 13-492-EF-33568

ONE DIMENSIONAL CONSOLIDATION TEST

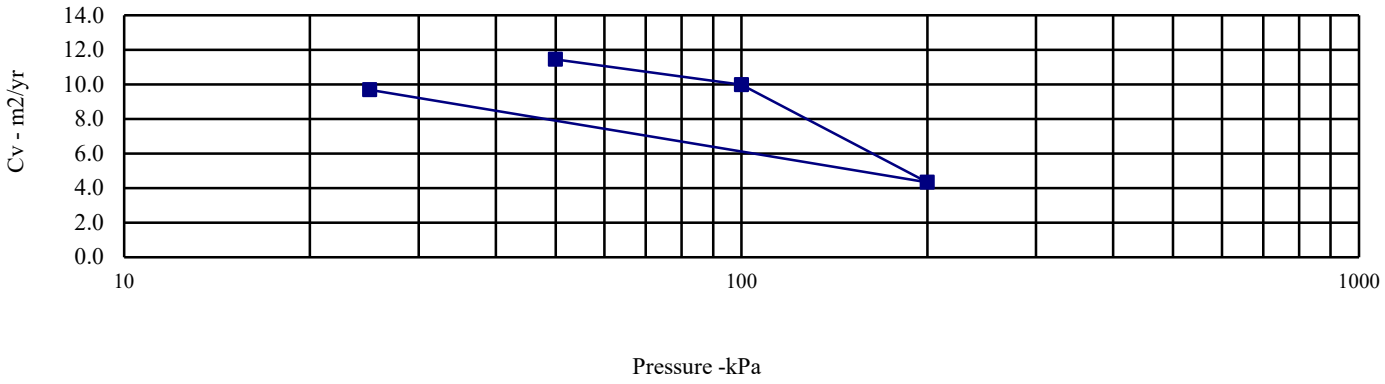
BS 1377: Part 5: 1990: Clause 3

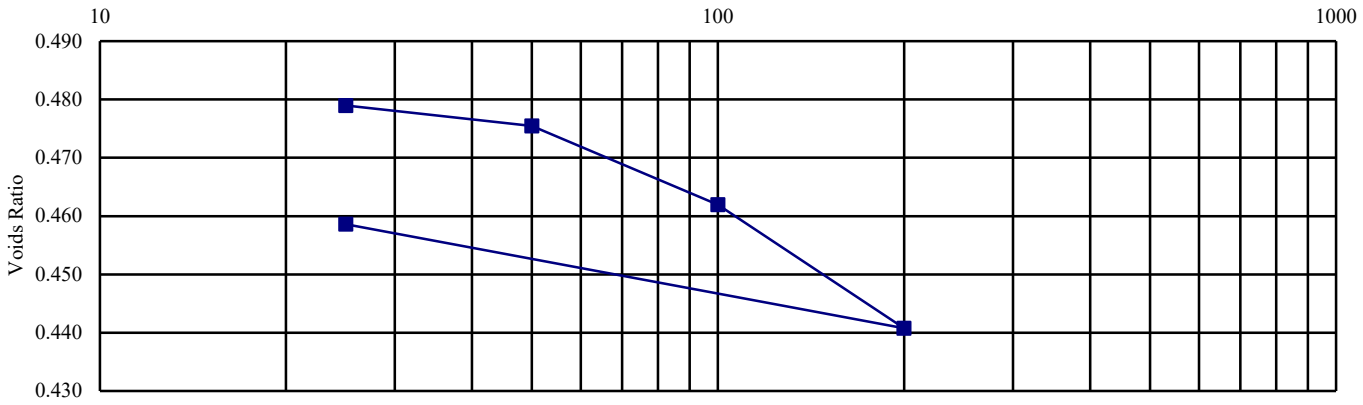
Hole Number: **WS125** **Top Depth (m):** **1.00**

Sample Number: **Base Depth (m) :** **1.50**

Sample Type: **Liner**

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	18						
Bulk Density (Mg/m3):	2.11	0	25	Swelling	Swelling	Method used to	
Dry Density (Mg/m3):	1.79	25	50	0.095	11.443	determine CV:	T90
Voids Ratio:	0.480	50	100	0.183	9.974	Nominal temperature	
Degree of saturation:	99.9	100	200	0.145	4.321	during test ' C:	20
Height (mm):	19.838	200	25	0.071	9.683	Remarks:	
Diameter (mm)	50.02					See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65						





UKAS TESTING 4043	PSL Professional Soils Laboratory	**Riverpark**	**Contract No:** PSL19/6919 **Client Ref:** 13-492-EF-33568

APPENDIX X
ORIGIN OF CHEMICAL ASSESSMENT CRITERIA

CONSTITUENT	ORIGIN OF RISK ASSESSMENT VALUE
Arsenic	2014 LQM/CIEH S4ULs
Cadmium	2014 LQM/CIEH S4ULs
Chromium	2014 LQM/CIEH S4ULs
Lead	2014 LQM/CIEH S4ULs
Mercury	2014 LQM/CIEH S4ULs – methylmercury
Nickel	2014 LQM/CIEH S4ULs
Selenium	2014 LQM/CIEH S4ULs
Copper	2014 LQM/CIEH S4ULs
Zinc	2014 LQM/CIEH S4ULs
Cyanide – Total	2014 LQM/CIEH S4ULs
Phenols – Total	2014 LQM/CIEH S4ULs
Naphthalene	General assessment criteria (GAC) developed by CIEH/LQM Suitable 4 Use Levels with supporting data from SR3, SR7 and existing Tox report where applicable. 1% SOM.
Acenaphthylene	
Acenaphthene	
Fluorene	
Phenanthrene	
Anthracene	
Fluoranthene	
Pyrene	
Benzo(a)Anthracene	
Chrysene	
Benzo(b/k)Fluoranthene [iii]	
Benzo(a)Pyrene	
Indeno(123-cd)Pyrene	
Dibenzo(a,h)Anthracene	
Benzo(ghi)Perylene	
TPH C_5-C_6 (aliphatic)	
TPH C_6-C_8 (aliphatic)	
TPH C_8-C_{10} (aliphatic)	
TPH C_{10}-C_{12} (aliphatic)	
TPH C_{12}-C_{16} (aromatic)	
TPH C_{16}-C_{21} (aromatic)	
TPH C_{21}-C_{35} (aromatic)	

APPENDIX XI
FALLING HEAD PERMEABILITY TESTS

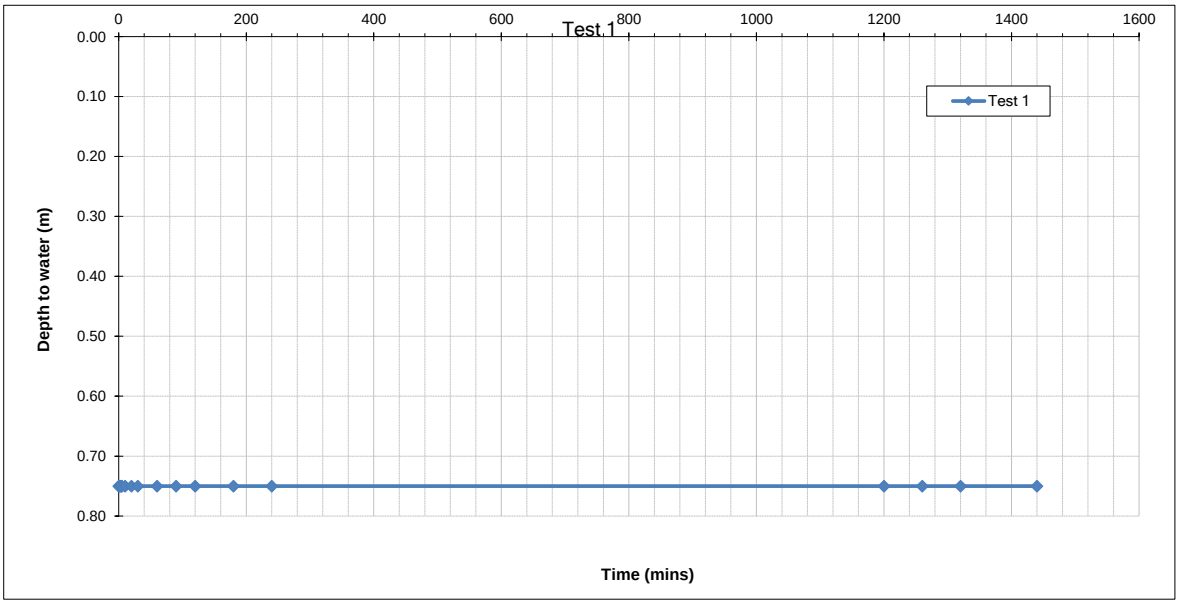
e3p	**Site:** Riverpark **Job Number:** 17-246 **Date of Test:** 17/01/2024 to 19/01/2024	**Trial Pit Number:** SA201 (TP208) **Length:** 2.00 m **Width:** 0.60 m **Depth:** 1.80 m **Groundwater Level:** Not encountered m

Test 1 did not reach 75% or 25 % effective storage depth.

	TEST 1	TEST 2	TEST 3
Time(min)	Depth to Water (m)		
0	0.75		
1	0.75		
2	0.75		
3	0.75		
4	0.75		
5	0.75		
10	0.75		
20	0.75		
30	0.75		
60	0.75		
90	0.75		
120	0.75		
180	0.75		
240	0.75		
1200	0.75		
1260	0.75		
1320	0.75		
1440	0.75		

Effective Storage Depth	m	1.05		
75% Effective Storage Depth	m	0.79		
(i.e. depth below GL)	m	1.01		
25% Effective Storage Depth	m	0.26		
(i.e. depth below GL)	m	1.54		
Effective Storage Depth 75%-25%	m	0.53		
Time to fall to 75% effective depth	mins	0.00		
Time to fall to 25% effective depth	mins	0.00		
V (75%-25%)	m3	0.63		
a (50%)	m2	3.93		
t (75%-25%)	mins	N/A		
SOIL INFILTRATION RATE	m/s	**N/A**		

DESIGN SOIL INFILTRATION RATE, f	**N/A - Failed to reach 25% effective depth within 24 hours and therefore tests were terminated.**



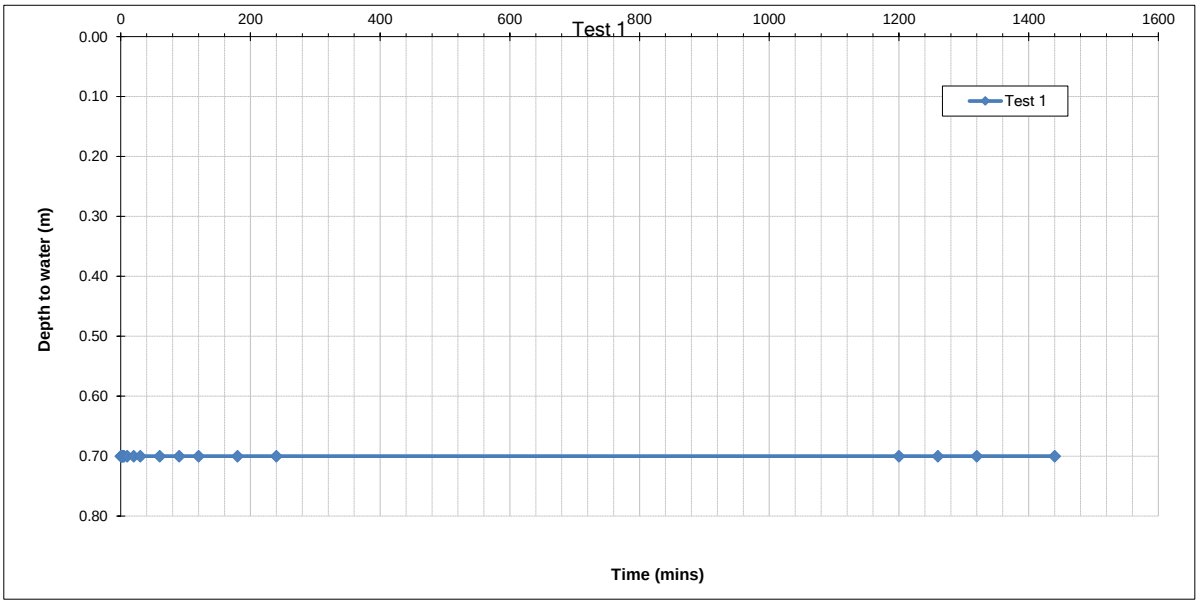
e3p	**Site:** Riverpark **Job Number:** 17-246 **Date of Test:** 17/01/2024 to 19/01/2024	**Trial Pit Number:** SA202 (TP210) **Length:** 1.90 m **Width:** 0.60 m **Depth:** 1.70 m **Groundwater Level:** Not encountered m

Test 1 did not reach 75% or 25 % effective storage depth.

Time(min)	TEST 1 Depth to Water (m)	TEST 2	TEST 3
0	0.70		
1	0.70		
2	0.70		
3	0.70		
4	0.70		
5	0.70		
10	0.70		
20	0.70		
30	0.70		
60	0.70		
90	0.70		
120	0.70		
180	0.70		
240	0.70		
1200	0.70		
1260	0.70		
1320	0.70		
1440	0.70		

Effective Storage Depth	m	1.00		
75% Effective Storage Depth	m	0.75		
(i.e. depth below GL)	m	0.95		
25% Effective Storage Depth	m	0.25		
(i.e. depth below GL)	m	1.45		
Effective Storage Depth 75%-25%	m	0.50		
Time to fall to 75% effective depth	mins	0.00		
Time to fall to 25% effective depth	mins	0.00		
V (75%-25%)	m3	0.57		
a (50%)	m2	3.64		
t (75%-25%)	mins	N/A		
SOIL INFILTRATION RATE	m/s	**N/A**		

DESIGN SOIL INFILTRATION RATE, f	**N/A - Failed to reach 25% effective depth within 24 hours and therefore tests were terminated.**



e3p	**Site:** Riverpark **Job Number:** 17-246 **Date of Test:** 17/01/2024 to 19/01/2024	**Trial Pit Number:**	SA203 (TP201)
		Length:	2.00 m
		Width:	0.70 m
		Depth:	1.50 m
		Groundwater Level:	Not encountered m

Test 1 did not reach 75% or 25 % effective storage depth.

	TEST 1	TEST 2	TEST 3
Time(min)	Depth to Water (m)		
0	0.40		
1	0.40		
2	0.40		
3	0.40		
4	0.40		
5	0.40		
10	0.40		
20	0.40		
30	0.40		
60	0.40		
90	0.40		
120	0.40		
180	0.40		
240	0.40		
1200	0.40		
1260	0.40		
1320	0.40		
1440	0.40		

Effective Storage Depth	m	1.10		
75% Effective Storage Depth	m	0.83		
(i.e. depth below GL)	m	0.68		
25% Effective Storage Depth	m	0.28		
(i.e. depth below GL)	m	1.23		
Effective Storage Depth 75%-25%	m	0.55		
Time to fall to 75% effective depth	mins	0.00		
Time to fall to 25% effective depth	mins	0.00		
V (75%-25%)	m3	0.77		
a (50%)	m2	4.37		
t (75%-25%)	mins	N/A		
SOIL INFILTRATION RATE	m/s	**N/A**		

DESIGN SOIL INFILTRATION RATE, f	**N/A - Failed to reach 25% effective depth within 24 hours and therefore tests were terminated.**

