Intelligent Ground Solutions

# Geo-Environmental Assessment

Navigator Quarter, Southampton
Mitchell Way, SO50 5QJ

**For Blocwork (Eastleigh) LLP and AGS Airports Group Limited**

18 July 2025
Report ref. 25/4362.A.3.GEA

Registered in England number 4638532.
Address Coniston House, Louisa Street, Idle, BD10 8NE. VAT number 809080436

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| 2 | 18th July 2025 | Final report issue to client following completion of monitoring regime |

| Report Prepared By | Signature | Date |
|---|---|---|
| Jessica Rowe<br>Principal | [redacted] | 18 July 2025 |
| **Report Reviewed By** | **Signature** | **Date** |
| Megan O'Kelly<br>Geo-Environmental Consultant | [redacted] | 18 July 2025 |
| **Report Authorised By** | **Signature** | **Date** |
| Tom Horner<br>Associate Director | [redacted] | 18 July 2025 |

## Executive Summary

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| **Brief** | The study was undertaken as a preliminary investigation prior to proposed redevelopment of the site for a commercial/light industrial end use. The assessment focuses on the northern area of the site, along the route of the proposed access road. Further investigation will be required across the development area. |
| **Site Location** | Navigator Quarter, Southampton, Mitchell Way, SO50 5QJ. Grid reference 445940, 117680.<br>The site currently comprises an access road and disused car parking area associated with Southampton International Airport in the west, fallow grassland in the east and northeast, separated by a historical railway embankment which is densely vegetated. Infrastructure (blast barriers and lighting) associated with the adjacent runway are present in the north and southeast of the site. |
| **Site Setting** | Earliest available historical mapping shows that the site largely comprised agricultural land with a farm (North Stoneham Farm) in the southeastern corner. By the early 1900s a railway line was noted along the northern boundary, dissecting the site in an approximate east-west orientation. Two gravel pits were also noted during this time in the northwestern and southeastern corners. The site has been associated with a use as an airfield/airport since 1910, originally known as Eastleigh Airfield. The area was then used by the United States during WWI and by the RAF in WWII, with the area known as RAF Eastleigh before becoming RAF Southampton, and later RNAS Eastleigh (HMS Raven) as a training ground for the Royal Navy. Development was historically present in the southern area associated with the military use (likely barracks) and currently in the northwest associated with disused airport car parking. The majority of the site (eastern and northeastern field) has remained undeveloped throughout history.<br>The site is indicated to be underlain by a sequence of Topsoil and / or Made Ground (in locations of former buildings/embankments or infilled ground) followed by River Terrace Deposits (Secondary Undifferentiated Aquifer) and London Clay Formation (Unproductive Strata) in the west or the Wittering Formation (Secondary Undifferentiated Aquifer) in the east. Drainage ditches are present along the northern central boundary and along the southern boundary of the site. In the wider area there are several tributaries of the River Itchen located to the east and south of the site. The area to the east is classified as a SSSI and conservation area. |
| **Ground Conditions** | Based on the investigation to date the ground conditions comprise a limited thickness of Made Ground (in developed areas only), proven to a maximum depth of 1.50 m bgl followed by natural cohesive silts of the River Terrace Deposits to c. 1.50 m bgl followed by granular gravels to c. 5.00 m bgl. Across the eastern area the River Terrace Deposits were identified directly below topsoil. Bedrock of the London Clay Formation was identified as silt/sandy silt across much of the western and central northern areas to completion of the boreholes at 10.00 m bgl. The Wittering Formation of sand and silt was identified below a limited thickness of River Terrace Deposits within two locations in the most eastern southern areas.<br>Groundwater was identified during drilling at depts between 2.70 m bgl and 4.40 m bgl within the River Terrace Deposits and at 7.90 m bgl to 8.00 m bgl within the London Clay Formation. Return monitoring of the installed wells recorded groundwater between 2.96 m bgl to 6.04 m bgl (6.59 m AOD to 9.90 m AOD). |

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| **Geotechnical Assessment** | Based on the testing undertaken it is recommended that a conservative CBR value of 1 % should be adopted for the shallow Made Ground and cohesive materials of the River Terrace Deposits and 2 % be adopted for the granular River Terrace Deposits.<br>Shallow traditional foundations may be suitable for the proposed commercial development; however, further investigation will be required to determine the ground conditions. |
| **Contaminated Land Assessment** | No significant potential sources of contamination have been identified, and widespread or significant contamination of the soils has not been identified, as such the risk to future site users is considered to be **Very Low** across the access road area.<br>Elevated concentrations of metals have been identified across the proposed roadway area within groundwater and elevated hydrocarbons were also identified in the central northern area. Hydrocarbons are known to be present within groundwater in this area, understood to be migrating from the rail yard to the north. This contamination is monitored and assessed by a third-party who should be consulted for further details. The risk to construction workers and future site users is considered to be **Low** across the access road area.<br>Evidence of gross volatile contamination was not identified during screening of on-site soils, during return monitoring or within groundwater samples.<br>Following completion of six rounds of monitoring the development has been classified as a CS1, whereby ground gas protection measures are not required across the access road area. Further assessment will be required across the wider development area. |
| **Recommendations** | Additional investigation may be required for detailed design of the proposed access road due to site constraints identified at the time of this investigation. Furthermore, investigation will be required across the wider development area. The following development considerations are considered appropriate;<br>• Suitable safe working procedures during development such as a discovery strategy;<br>• If required, production of a Materials Management Plan (MMP) to facilitate sustainable materials re-use;<br>• Basic Radon protection measures may be required within new buildings constructed at the site;<br>• Potential for upgraded water supply pipes;<br>• Additional waste classification testing may be required; and,<br>• Further sampling and testing may be required to confirm geotechnical and contaminative suitability of soils for use in detailed earthworks design. |
| This table is a summary only, full details and limitations of the assessment are provided within the main body of the report. | |

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# 1.0 Introduction

Geo$^2$ Limited were commissioned by Blocwork (Eastleigh) LLP and AGS Airports Group Limited to conduct a Geo-Environmental Assessment of a site known as Navigator Quarter, Southampton, Mitchell Way, SO50 5QJ. The site is approximately 32.62 hectares in area and located at grid reference 445940, 117680.

The study was undertaken as a preliminary investigation prior to proposed redevelopment of the site for a commercial/light industrial end use. The assessment focuses on the northern area of the site, along the route of the proposed access road. Further investigation will be required across the development area.

## 1.1 Scope of Works

The scope of the investigation has been designed with consideration of guidance on Planning Practice Guidance (Land Affected by Contamination), Land Contamination: Risk Management pages of the GOV.UK web pages and the relevant requirements of the National Planning Policy Framework (NPPF) (as amended, 2024) (paragraphs 187 & 196-197). The geotechnical scope of investigation was designed in consideration with BS EN 1997-1:2004 Eurocode 7: Geotechnical Design – Part 1 General Rules and BS EN 1997-2:2007 Eurocode 7: Ground Investigation and Testing. Unless specifically stated, this report does not constitute a Geotech Design Report (GDR) under Eurocode 7 guidance.

The intrusive investigation was conducted between 3rd and 6th February 2025. The investigation was undertaken in accordance with Geo$^2$'s agreed proposal (Ref. Q4362_V3, dated 23rd January 2025). The findings of the investigation are presented herein.

## 1.2 Previous Reports

The previous reports undertaken by Geo$^2$ should be read in conjunction with this assessment:

- Preliminary Risk Assessment, by Geo$^2$, Ref. 25/4362.A.1, dated 27th February 2025; and,
- Preliminary Source Study Report, by Geo$^2$, Ref. 25/4362.A.2.PSSR, dated 31st March 2025.

In addition, the following third-party report has been obtained from planning records/provided to Geo$^2$ by the Client for review:

- Geo-Environmental Preliminary Risk Assessment, Southampton Airport, Eastleigh, by WSP, Project No. 70048854, dated August 2019 *[report relates to the site and wider airport];*
- Generic Quantitative Risk Assessment, Southampton Airport, Eastleigh, by WSP, Project No. 70048854, dated September 2019 [*this report relates to land adjacent to the northern area and the central northern area of the site];*
- Environmental Statement Chapter 12: Ground Conditions, Southampton International Airport Eastleigh, by Savills dated July 2020 *[report relates to the site and wider airport];*

- Factual Ground Investigation Report, Southampton International Airport Runway Extension, by Southern Testing, Ref. J14044, dated May 2020, Issue No. 7 *[this report relates to land adjacent to the northern area and the central northern area of the site];*
- Groundwater Monitoring Results January 2015 to September *2023 [relates to water monitoring in the central northern area of the site]*; and,
- Phase II Land Quality Assessment for runway extension, Southampton Airport, by H Fraser Consulting, Ref. 30691R2, dated January 2023 *[this report relates to land adjacent to the northern area and the central northern area of the site].*

Further third-party reports are referenced within the WSP Preliminary Risk Assessment and Environmental Statement Chapter, however, these reports have not been made available to Geo$^2$ or identified on the planning portal. A review of the available third-party reports is provided for information purposes only.

# 2.0 Description of the Site and Surroundings

## 2.1 Site Description

The site is located approximately 6 km north of Southampton city centre. Figure 1 in Appendix A shows the location of the site.

The site currently comprises an access road and disused car parking associated with Southampton International Airport in the west, fallow grassland in the east and northeast separated by a historical railway embankment which is densely vegetated. Infrastructure (blast barriers and approach lighting) associated with the adjacent runway are present in the north and southeast of the site. The site is accessed through the car parking in the northwest and via a bridge beneath the railway line along the northeastern boundary.

The area shown within the red site boundary on Figure A below, will be referred to throughout this document as 'the site'.



**Figure A:** Site Location Plan. Site boundary in red Contains © Crown Copyright and Database Right 2024

## 2.2 Site Walkover

A site walkover was undertaken on 16th January 2025. The site walkover findings are detailed below.

The site was accessed via Mitchell Way in the northwestern corner. Mitchell Way led to a tarmac car park and a mixed gravel and tarmac car park in the northwestern-most corner of the site. An area of disused grassland was also noted adjacent to the car parks with sporadic fragments of concrete and metal noted on the surface.

The site wrapped around the northern extent of Southampton Airport runway comprising a gravel track and densely vegetated bund. Runway approach lights were noted adjacent to the site in this area. The site was separated from the runway and associated areas by a c. 2.50 m metal wire fence.

The majority of the site comprised vacant grassland separated by a densely vegetated embankment in the central area running in an east to west orientation. This embankment was considered to represent a former railway line. Concrete blocks and metal fragments were noted in the material of

the embankment where bare ground was visible. Access to the northeastern field was via foot over the embankment or via a metal gate along the northern boundary. The northern access was noted to be flooded at the time of the walkover by c. 0.4 m of water. The track off-site to the north passed beneath the railway line via a brick tunnel.

Further airport infrastructure was noted in the larger southern field comprising a radar station and windsock flagpoles. In addition, a series of third-party boreholes were noted in the northern central area, which were understood to relate to the investigation of off-site hydrocarbon contamination from the adjacent railway yard.

The remains of former buildings could be seen in the southern-most area of the site comprising remnant brick walls and concrete floors with rubble, engines, metal and corrugated sheeting. No evidence of asbestos containing materials were noted, however, the area was densely vegetated, as such, the potential cannot be discounted.

An above ground storage tank was noted off-site adjacent to the central northern area of the site.

The site was bounded by the airport in the east and largely by vegetation, hedgerow and trees along the eastern and northern boundaries.

## 2.3 Site Surroundings

The surrounding land uses of the site are summarised below.

| Direction | Land Use |
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| North | A rail yard, commercial properties and residential housing to the northwest. Sewage treatment works to the northeast and agricultural land beyond. |
| East | River Itchen and Itchen Valley Country Park. |
| South | Southampton Airport to the southwest. Itchen Valley Country Park and the River Itchen to the southeast. |
| West | Residential properties beyond the A335. |

# 3.0 Desk Study

## 3.1 Desk Study Data

A *Preliminary Risk Assessment* was undertaken by Geo$^2$ (ref: 25/4362.A.1) dated 27th February 2025. Pertinent information from the report is summarised below:

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| **Site Geology, Hydrogeology and Hydrology** | British Geological Survey (BGS) data indicates that the site is underlain by superficial River Terrace Deposits (clay and silt) followed by bedrock of the London Clay Formation (clay, silt and sand) in the west and the Wittering Formation (sand, silt and clay) in the east.<br>Superficial deposits of Alluvium (clay, silt, sand and gravel) are mapped adjacent to the east of the site associated with the River Itchen, which may encroach onto site.<br>Artificial ground is mapped along the northeastern boundary of the site, likely associated with the raised railway embankment in this area.<br>A BGS borehole (Ref. SU41NE230) is located along the western boundary of the site, drilled in 1969. The ground conditions recorded comprised superficial clay, sand and gravel to c. 5.3 m bgl (below ground level) followed by clay and sand of the London Clay Formation to completion at 30.5 m bgl. Resting groundwater was identified at c. 3.0 m bgl.<br>Two further BGS boreholes (Ref. SU41NE277 and SU41NE109) are located <50 m from the southeastern boundary of the site. The ground conditions in these locations comprised soft clay and peat at shallow depths (<2.0 m) followed by gravel and sand to c. 4.50 m bgl and firm to stiff bedrock clay below.<br>The site has no to low hazard regarding the potential for ground stability hazards including collapsible ground, ground dissolution, and running sands. A moderate hazard relating to compressible ground and shrinking or swelling clays has been identified.<br>The Environment Agency (EA) classify the superficial River Terrace Deposits as a Secondary (Undifferentiated) Aquifer and the Wittering Formation and Alluvium as Secondary A Aquifers. The London Clay Formation is classified as Unproductive Strata.<br>The site is not located within a groundwater source protection zone (SPZ).<br>According to the Envirocheck Report there are no licensed groundwater abstractions within 1 km of the site.<br>Drainage ditches are present along the northern central boundary and along the southern boundary of the site. In the wider area there are several tributaries of the River Itchen located to the east and south of the site. At its closest the river is approximately 170 m east.<br>According to the Envirocheck Report there are three licensed abstractions from surface water located approximately 50 m east relating to abstraction for use in transport.<br>There are two Pollution Incidents to Controlled Waters recorded within 250 m of the site, the nearest of which is located approximately 90 m west of the site and relates to the release of waste oil in July 1994, resulting in a Category 3 – Minor Incident.<br>Eight Discharge Consents are recorded within 250 m of the site, the nearest of which is located approximately 75 m west of the site and relates to trade effluent |

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| | discharge (site drainage) into groundwater via a soakaway. The licence is held by Southampton International Airport, dated July 2020, and is noted to be 'varied under EPR 2010'. |
| Mining | The Envirocheck Report records two BGS Recorded Mineral Sites located in the northwestern and southeastern corners of the site. Both entries relate to opencast quarrying of superficial sand and gravel and the operations are noted as ceased. Both quarries are noted on historical mapping and are likely infilled.<br>Four BGS Recorded Mineral Sites are recorded within 250 m of the site, the nearest of which is located approximately 90 m northeast of the site and relates to opencast quarrying of sand and gravel; however, the operations are noted as ceased.<br>The site is not within an area which may be affected by coal mining activity, therefore the risk to the proposed development from shallow coal mining is considered to be Low. |
| Radon | The site is in a low (less than 1% of homes are estimated to be at or above the Action Level) to intermediate probability radon area (up to 3 to 5% of homes are estimated to be at or above the Action Level). Given the site is located within two probability areas, it is recommended that the requirement for radon protective measures is confirmed with the Local Authority / Building Control. At this stage it would be prudent to allow for basic radon protective measures within new buildings. |
| Waste and Infilled Land | According to the Envirocheck Report, there is a Historical Landfill Site registered in the northwest of the site associated with the former gravel pit. Details indicate that the licence was held by British Rail and deposited waste included household materials. No further pertinent information is supplied.<br>The following entries are recorded within 250 m of the site:<br>• One Historical Landfill Site located approximately 225 m west of the site, named as 'Land at Lakeside'. Details indicate that the licence was held by H T Hughes and Sons (Transport) Limited and deposited waste included inert waste;<br>• Two Licensed Waste Management Facilities (locations), the nearest of which is located approximately 65 m east of the site and relates to a physical treatment facility. The licence is held by Aquavitrum Limited and was issued in February 2023;<br>• Three areas of Potentially Infilled Land (non-water), the nearest of which is located approximately 85 m north of the site and was mapped in 1990;<br>• One area of Potentially Infilled Land (water) located approximately 100 m northeast of the site, mapped in 1938; and<br>One Registered Landfill Site located approximately 235 m west of the site, operated by Sir Alfred Macalpine & Sons Ltd. The licence is dated January 1983 and has since lapsed/been cancelled or surrendered. Authorised waste is reported to have comprised excavated natural materials and household waste. |
| Unexploded Ordnance | A review of Zetica online risk mapping for the area indicates that the site is located in a Moderate risk area, with Southampton Airport listed as a Luftwaffe target. |

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| | A Detailed Explosive Ordnance Risk Assessment has been undertaken for the site by Impartial Assessments which concludes that Explosive Ordnance poses a Low to Moderate Risk to proposed ground investigation and the development. |
| Sensitive Environmental Receptors | An area of Special Scientific Interest is listed on-site, however, is considered to relate to the River Itchen and surrounding land which is also classified as a Special Area of Conservation. The site is also located within a Nitrate Vulnerable Zone (NVZ) relating to eutrophic water (Hamble Estuary Eutrophic Nvz).<br>Historic England Records (historicengland.org.uk) indicate that no areas of designated heritage interest are located on or adjacent to the site. |
| Site History | Earliest available historical mapping shows that the site largely comprised agricultural land with a farm (North Stoneham Farm) in the southeastern corner. By the early 1900s a railway line was noted along the northern boundary, dissecting the site in an approximate east-west orientation. Two gravel pits were also noted during this time in the northwestern and southeastern corners.<br>The site has been associated with a use as an airfield/airport since 1910, originally known as Eastleigh Airfield. The area was then used by the United States during WWI and by the RAF in WWII, with the area known as RAF Eastleigh before becoming RAF Southampton, and later RNAS Eastleigh (HMS Raven) as a training ground for the Royal Navy. Development was historically present in the southern area associated with the military use (likely barracks) and currently in the northwest associated with disused airport car parking. The majority of the site (eastern and northeastern field) has remained undeveloped throughout history. |

## 3.2 Existing Reports

The following third-party report has been provided to Geo$^2$ by the Client for review:

- Southern Testing, Factual Ground Investigation Report, Southampton International Airport Runway Extension, (Ref. J14044), dated May 2020, Issue No. 7 *[this report relates to land adjacent to the northern area and the central northern area of the site]; and*
- Email correspondence from Dyer and Butler Ltd regarding groundwater monitoring results from January 2015 to September 2023.

In addition, the following third-party reports were identified associated with planning references F/19/86707;

- WSP, Geo-Environmental Preliminary Risk Assessment, Southampton Airport, Eastleigh, (Project No. 70048854), dated August 2019;
- WSP, Generic Quantitative Risk Assessment, Southampton Airport, Eastleigh, (Project No. 70048854), dated September 2019;
- Savills, Environmental Statement Chapter 12: Ground Conditions, Southampton International Airport Eastleigh, dated July 2020; and
- H Fraser Consulting, Phase II Land Quality Assessment for runway extension, Southampton Airport, (Ref. 30691R2), dated January 2023.

Further third-party reports are referenced within the WSP Preliminary Risk Assessment and Environmental Statement Chapter, however, these reports have not been made available to Geo$^2$ or identified on the planning portal. A review of the available third-party reports is provided for information purposes only.

### 3.2.1 Previous Report Review

*WSP, Geo-Environmental Preliminary Risk Assessment, August 2019*

WSP undertook a Preliminary Risk Assessment for Southampton Airport in 2019 to support a runway extension in the north. The red line boundary included the majority of the current target site with the exception of the northeastern field. Pertinent information related to the target site is included below.

Fuel storage for the airport was largely stored along the western site boundary and historically comprised a number of underground storage tanks (now removed) in the southern area of the western boundary.

As part of the report WSP contacted the Environment Agency (EA) for information relating to remedial works undertaken on/adjacent to the site. The response indicated that the EA did not hold any records of remediation, however, did have documents relating to contamination associated with the rail depot ('Eastleigh Depot') located directly north of the site. The information indicated that oil contamination had been known to be present at the depot since 1998 with a further recorded leak in 2001 from the main fuel line. On-going monitoring was undertaken in 2003-2005, 2008 and 2015. Soil and groundwater contamination was identified c. 3.00 m bgl associated with the groundwater table in the River Terrace Deposit gravels. Correspondence also proposed that the hydrocarbons were potentially preferentially travelling along the high-pressure gas main route which was stated to be present along the northern boundary (separating the airport from the depot). Remedial works were planned for early 2018.

Further information provided by the EA included records of pollution incidents on-site including firefighting run-off (minor impact to land and water) in 2002, oil/fuel spillage (significant impact to land) in 2007 and oil/fuel containment and control failure (significant impact to land) in 2017. Details of a prohibition notice dated 1997 relating to de-icing run off was also provided. It was indicated that drainage of the run-off was diverted into foul drainage to prevent contamination of the underlying groundwater which was understood to be in continuity with the River Itchen. Following four months of monitoring, no impact/marginal deterioration of the groundwater downstream was noted.

Further third-party reports included an assessment of a bund in the northwestern corner which required removal prior to the car park development. Anecdotal evidence suggested that the mound comprised soil from the terminal construction. Chemical analysis indicated that the material was classified as 'inert'.

The report summarised a low to moderate risk to human health associated with the extension and a moderate to high risk to controlled waters related to the off-site hydrocarbon contamination. Ground investigation was recommended.

*WSP Generic Quantitative Risk Assessment, September 2019 and Southern Testing, Factual Ground Investigation Report, May 2020*

WSP undertook a Generic Quantitative Risk Assessment utilising initial data from the Southern Testing Ground Investigation (dated June 2019 at the time of the report preparation).

The ground investigation works comprised the advancement of 8 No. trial pits, 3 No. BRE365 tests and 2 No. cable percussion boreholes. The works were undertaken airside to the north and east of the runway (not within the current site boundary).

The ground conditions comprised a limited thickness of topsoil followed by firm to stiff silty sandy clay, becoming gravelly with depth to c. 1.90 m bgl, followed by medium dense gravelly sand/sandy gravel to c. 3.70 m bgl and fissured sandy silty clay of the London Clay Formation at depth. Groundwater was struck at depth in the London Clay within the boreholes, with standing water recorded at c. 4-5 m bgl at the start of each shift. Return groundwater monitoring over the following year recorded groundwater at depths of between 3.47 m bgl and 4.24 m bgl (10.26 m AOD to 9.49 m AOD). No visual or olfactory evidence of contamination was identified during the investigation.

Following soil chemical analysis none of the potential contaminants were identified above the applied commercial and public open space end use assessment criteria. Asbestos was not identified within the samples analysed. A single leachate sample identified potentially elevated copper concentrations above the applied EQS (inland surface waters), however, the one groundwater sample tested did not exceed the guidance values.

The report recommended further detailed review of information relating to the off-site fuel spills as it was unclear as of September 2019 whether physical remediation had been undertaken to address the pollutant linkage.

*Savills, Environmental Statement Chapter 12: Ground Conditions, July 2020*

The Environmental Statement used the previous WSP reports to provide the baseline conditions for the site to assess the impacts and effects from the development. Given that significant contamination was not identified during the ground investigation and the proposed development comprised a runway extension only, the potential impacts to ground conditions were considered to be negligible with consideration to the embedded mitigation measures as part of current best practice.

*H Fraser Consulting, Phase II Land Quality Assessment for runway extension, January 2023*

H Fraser Consulting undertook a further ground investigation along the northern runway area (predominantly outside of the current site boundary) in 2022 to support the planning application for the development. The ground investigation comprised the advancement of 10 No. shallow

boreholes to depths between 3-4 m bgl and 9 No. shallow hand dug pits to a maximum depth of 1 m bgl.

The ground conditions generally composed a limited thickness of topsoil followed by sandy gravelly clay and gravel at depth. Groundwater was identified during drilling between 3.00-3.50 m bgl. However, the wells were all noted to be dry upon return monitoring. A strong hydrocarbon odour was noted in the northeastern area (BH208) between 2.70 m bgl and 3.00 m bgl.

Following soil chemical analysis none of the potential contaminants were identified above the applied commercial guidance values. Elevated concentrations of hydrocarbons were identified in BH208 at 2.70 m bgl, but not at a shallower depth in the same location, indicating lateral migration of contamination, consistent with the known off-site hydrocarbons from the rail depot.

Elevated concentrations of ground gas were not identified during return monitoring and low/negligible flow rates were recorded.

Given the elevated hydrocarbon concentrations in BH208, a watching brief was recommended at the time of the soakaway installation.

*Groundwater Monitoring Results January 2015 to September 2023*

The Client has provided monitoring data for the central northern area of the site, undertaken by Ricardo Energy and Environment from January 2015 to September 2023. There is limited information available, however, the boreholes are understood to be in use for the monitoring of hydrocarbon contamination known to be migrating from the adjacent rail yard.

Groundwater has been recorded at depths between 0.772 m bgl and 4.825 m bgl (3.163m AOD to 10.770 m AOD). No logs or geotechnical testing data is provided.

Most recent monitoring results from March and September 2023 indicate the presence of free product (up to 15 mm in thickness in borehole F2 close to the northwestern corner of the northeastern field) and elevated Total TPH concentrations at a maximum of 1,244,385 µg/l in F2 from groundwater collected using disposable bailers. The locations of the boreholes and photographs of the groundwater sampled from these locations is shown below in Figure B:




**Figure B:** Image sent to the Client by Ricardo Energy and Environment

# 4.0 Preliminary Risk Assessment

## 4.1 Source – Pathway – Receptor

UK legislation and guidance on assessing potentially contaminated land recommends the use of a risk assessment process based on a review of source/pathway/receptor relationships for various environmental media. The first stage of any risk assessment is to identify, using the desk study data and site information, the presence and extent of any hazard at the site, theoretical or demonstrable.

A key component of the overall risk assessment process is identification of "significant contaminant linkages" between contaminants and receptors. This can be accomplished through development of a site-specific conceptual model in which the potential contaminants, pathways and receptors identified on-site are described.

Each element can be defined as follows:

- **Contaminant source:** A substance either on or under the land and which has the potential to cause harm or pollution to human or environmental receptors.
- **Pathway:** A route or means by which a receptor can be exposed to or affected by a source.
- **Receptor:** A living organism or an ecological system, or controlled water, or property including buildings, crops and livestock.

The presence of all three of the above elements identifies a contamination linkage and a potentially unacceptable risk. To ensure that any risk present to, or, from the site can be appropriately managed each of these contamination linkages will be targeted by the investigation.

## 4.2 Hazard Identification

Potential sources of on-site contamination have been identified associated with historical mineral extraction and subsequent landfilling in the northwest, the historical farm and mineral extraction in the south of the site (with possible infilling of the gravel pit). RAF/military use of the southern area of the site, railway embankment and filter tanks in the central area and development of airport infrastructure including car parks, radar towers and blast screens.

Information from the EA included within a previous WSP report for the site indicated that the following pollution incidents historically occurred on site: firefighting run-off (minor impact to land and water) in 2002, oil/fuel spillage (significant impact to land) in 2007 and oil/fuel containment and control failure (significant impact to land) in 2017. It was also noted that a prohibition notice was issued in 1997 relating to de-icing run off.

Due to the age of the historical buildings on site in the southern area, it is likely that asbestos materials were used in the construction of the buildings, leading to a potential for asbestos in shallow Made Ground soils.

Potential contaminants of concern include metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), poly- and perfluoroalkyl substances (PFAS) (associated with fire-fighting run-off), asbestos and ground gas.

Potential sources of contamination have been identified associated with the rail yard to the north and the wider airport. Hydrocarbon contamination (including free phase product) is known to be migrating onto site from the rail yard. Potential contaminants of concern include metals, petroleum hydrocarbons and polycyclic aromatic hydrocarbons.

A potential contaminant of concern commonly associated with sites where aircraft operate are Poly- and perfluoroalkyl substances (PFAS), associated mainly with Aqueous Film Forming Foam (AFFFs) used as a method of fire suppression for hydrocarbon fuelled fires (e.g. petrol, diesel and kerosene). PFAS have been commercially available since 1949, and a component of AFFFs since 1963.

## 4.3 Initial Conceptual Site Model (CSM)

Contamination linkages arise as a result of the interconnection of the contaminant source, contamination pathways and potential receptors. These contamination linkages are used to design the site investigation (if required), guiding the type of investigation, location of exploratory boreholes and the required sample analysis.

| Source(s) | Pathway(s) | Receptor(s) |
|---|---|---|
| Potential contamination (e.g. hydrocarbons, asbestos) associated with historical operation of the site and wider area as an airport and military base and the off-site rail yard to the north.<br>Historical landfill in the northwest.<br>Rail embankment through central northern area of the site. | Leaching to groundwater, lateral and vertical flow, followed by migration within the aquifer. | Underlying Secondary Undifferentiated Aquifer (River Terrace Deposits) and Secondary A Aquifers (Wittering Formation and Alluvium [if present]).<br>The River Itchen and associated tributaries to the east.<br>(controlled waters) |
| | Exposure to harmful vapours, hazardous ground gas and tainting of water supply. | Proposed commercial site end users. |
| | | Construction and maintenance workers. |
| | | Neighbouring site users. |
| | Direct contact, inhalation and ingestion. | Proposed commercial site end users. |
| | | Construction and maintenance workers. |
| Hydrocarbons within groundwater in the central northern area. | Lateral migration within the aquifer onto site followed by direct contact and inhalation. | Proposed commercial site end users. |
| | | Construction and maintenance workers. |

## 5.0 Site Investigation

An intrusive ground investigation was carried out between 3rd and 6th February 2025. The study was undertaken as a preliminary investigation prior to proposed redevelopment of the site for a commercial/light industrial end use. The assessment focuses on the northern area of the site, along the route of the proposed access road. Further investigation will be required across the development area.

### 5.1 Intrusive Investigation Scope

The intrusive investigation comprised the following activities as scoped by the Clients Engineer (Burrows Graham):

- Service avoidance and topographic survey undertaken in all intrusive locations by a specialist third party contractor to obtain x,y,z coordinates;
- All works logged in general accordance with BS5930:2015+A1:2020 Code of Practice for Ground Investigations;
- Drilling of four cable percussion boreholes (CP101 to CP104) up to a maximum depth of 10.00 m bgl with regular Standard Penetration Tests (SPTs);
- Advancement of twelve trial pits (TP101 to TP112) to a maximum depth of 3.60 m bgl. Three locations were subsequently converted into BRE365 infiltration tests (SA101 to SA103);
- Excavation of seven hand dug trial pits (HP101 to HP107) to a maximum depth of 1.20 m bgl; and,
- The installation of four ground gas and groundwater monitoring wells within CP101 to CP104 up to 6.00 m bgl.

Field analysis comprised the examination of each of the samples for visual and olfactory indications of contamination. Analysis was also conducted for volatile hydrocarbons using a photo-ionisation detector (PID).

An Exploratory Hole Location Plan is appended in Appendix A as Figure 2A and 2B.

#### 5.1.1 Limitations

The following limitation were noted during the works:

- The scope of investigation was specified by the Clients Engineer (Burrows Graham);
- Intrusive locations were restricted at the northern end of the runway given the active nature of the airport and height restrictions for equipment;

- Due to the presence of several services on-site including a high-pressure gas main, some locations had to be moved to a safe distance away from these services with approval from SGN engineer;
- The central northern area (former railway embankment) was densely vegetated, as such locations were limited;
- The investigation and geotechnical assessments provided are specific to the proposed development anticipated, and may not be relevant for other development schemes should these be considered in the future;
- The investigation was designed to provide preliminary information only and further information may be required in due course to discharge site specific planning conditions/ detailed design;
- The locations across the east and south were placed to provide a general site coverage in the absence of a finalised proposed development plan;
- Although earthworks are anticipated to be required at the site, a cut/fill drawing was not provided at the time of the intrusive ground investigation; and,
- No proposed loadings or elevations have been provided by the Client/Engineer.

Figure 3 in Appendix A summarises the site constraints.

## 5.2 Ground Conditions

A summary of the ground conditions encountered at the site are summarised in the table below. Field logs are presented in Appendix B.

| Exploratory Hole Locations | | | | | |
|---|---|---|---|---|---|
| Stratum | Depth Range Top of Strata (m bgl) | Thickness (m) | | Description | Comments |
| | | Min | Max | | |
| **Made Ground - Topsoil** | 0.00 | 0.15 | 0.30 | Identified across the eastern and northeastern fields as sandy silt with rare quartzite gravel. | - |

| Exploratory Hole Locations | | | | | |
|---|---|---|---|---|---|
| Stratum | Depth Range Top of Strata (m bgl) | Thickness (m) | | Description | Comments |
| | | Min | Max | | |
| **Made Ground** | 0.00 | 0.50 | 1.50 | Generally variable including mixed lithology gravel and silt with brick and quartzite. Materials within the former rail embankment noted to comprise gravelly sand with wood, plastic, metal and rare textile inclusions. Ash was also noted within the embankment. | Generally present in the northwestern developed area/within the former rail embankment. Depth not proven within HP101, HP102 and HP104. |
| **River Terrace Deposits** | 0.15 - 1.50 | 1.40 | 5.20 | River Terrace Deposits were identified below the Made Ground in all locations initially recorded as sandy silt becoming sandy clayey gravel and sandy gravel at depth. The shallow silt was generally recorded as thicknesses between 0.20 m and 1.60 m. | Present in all locations where the base of the Made Ground was proven. Base proven within CP101-CP104, TP109 and TP111 only. |
| **Wittering Formation** | 1.70 - 2.30 | Not Proven (>1.80) | | Identified below the River Terrace Deposits as greenish/bluish grey sand and silt. | Identified within TP109 and TP111 only. |
| **London Clay Formation** | 4.20 - 5.40 | Not Proven (>5.80) | | Identified below the River Terrace Deposits as dark grey sandy silt. | Present in CP101 to CP104 only. |

Made Ground was present within the northwestern developed areas and within the former rail embankment. The Made Ground in the northwest generally comprised a limited thickness of macadam underlain by gravel of brick, quartzite and mudstone. Locally deeper Made Ground was identified within TP103 and CP102 (towards the area of the backfilled gravel pit) to a depth of 1.50 m bgl and comprised silt with brick and quartzite gravel. The Made Ground within the rail embankment was noted to comprise gravelly sand with inclusion of anthropogenic materials including brick, plastic, wood and metal. Given the embankment was heavily vegetated in combination with the active nature of the site, the full thickness of the Made Ground was not proven.

The underlying natural deposits generally comprised an initial thickness of sandy silt, grading to a silty gravel and sandy gravel at depth. A cross-section along the northwestern and central area is

presented in Figure 5. The section shows an increase of the River Terrace Deposit depths in the central area (maximum 5.20 m) followed by a notable decrease to 1.40 m thickness within TP109 in the east underlain by the Wittering Formation. This is consistent with information held by the BGS which indicates sand and gravel to be c. 1.20 – 2.40 m in thickness directly east following ground investigation in the mid 1960's. The River Terrace Deposits were proven to be 1.60 m in thickness within TP111 in the central southern area, this does vary from the below plan which indicates over 12 feet of sand and gravel off-site. An abstract of the plan is provided as Figure C below with the site boundary shown for reference.

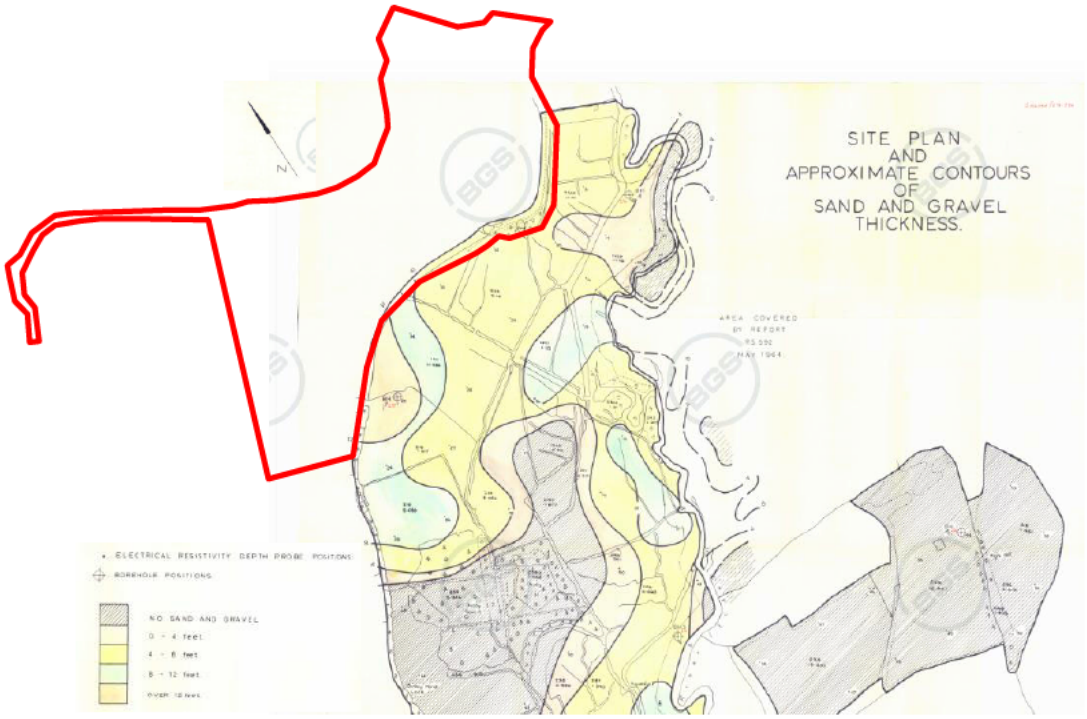



Figure C: Sand and Gravel Thickness Plan - 1964

Two bedrock strata's were identified during the ground investigation; The London Clay Formation across the western and central areas and the Wittering Formation in the east and central south. The Wittering Formation was proven within two locations only, considered to be present due to the green hue of the sand/silt as the BGS lexicon indicates *'fine to medium-grained sparsely glauconitic sand'*. Given bluish grey sand and silt was identified below, it is reasonable to infer that this could be representative of the London Clay/the boundary of the two formations.

### 5.2.1 Groundwater Strikes

Groundwater strikes identified during the ground investigation are summarised in the below table.

| Exploratory Hole Location | Water Strike (m bgl) | Water Strike (m AOD) | Strata |
|---|---|---|---|
| **TP105** | 3.00 | 10.16 | River Terrace Deposits |
| **TP106** | 3.10 | 9.68 | |
| **TP107** | 2.90 | 9.76 | |
| **TP109** | 2.40 | 8.43 | Wittering Formation |
| **TP110** | 2.60 | 9.42 | River Terrace Deposits |
| **TP111** | 3.60 | 6.75 | Wittering Formation |
| **TP112** | 2.70 | 9.27 | River Terrace Deposits |
| **CP101** | 4.40 | 9.90 | |
| **CP102** | 4.40 | 9.53 | |
| **CP103** | 3.20 | 9.66 | |
| | 7.90 | 4.96 | London Clay Formation |
| **CP104** | 4.00 | 8.63 | River Terrace Deposits |
| | 8.00 | 4.63 | London Clay Formation |

### 5.2.2 Obstructions

No obstructions were noted during the investigation.

### 5.2.3 Potential Observed Contamination

A slight hydrocarbon odour (diesel) was noted within CP103 within wet arisings following the identification of groundwater at 3.20 m bgl (9.66 m AOD). PID readings at this location were low with the arisings with a hydrocarbon odour recording a maximum reading of 1.9 ppm.

No further visual or olfactory evidence of contamination was noted during the investigation.

During the first round of monitoring a slight hydrocarbon odour was noted within groundwater at CP103 and a moderate odour was noted within CP104. A sheen was recorded within CP103; however, no free product was noted in the wells.

## 5.3 Ground Gas and Groundwater Monitoring

Monitoring wells were installed in four boreholes (CP101 to CP104) and monitored on six occasions between 25th February 2025 and 15th July 2025. Wells were installed with 50mm HDPE plastic pipe.

The ground gas data is discussed in Section 7.0.

The groundwater monitoring data is present in Appendix C and also summarised in the below table. Where Light Non-Aqueous Phase Liquid (LNAPL) has been identified, this is detailed below.

| Monitoring Well | Response Zone (m bgl) | Depth to Water (m bgl) | Depth to Water (m AOD) | LNAPL | Comments |
|---|---|---|---|---|---|
| **CP101** | 2.00 - 6.00 | *4.59 - 5.40* | *8.90 - 9.71* | *N* | - |
| **CP102** | 1.00 - 6.00 | *4.17 - 5.00* | *8.93 - 9.76* | *N* | - |
| **CP103** | 1.00 - 5.00 | *2.96 - 4.55* | *8.31 - 9.90* | *N* | - |
| **CP104** | 1.00 - 5.50 | *3.02 - 6.04* | *6.59 - 9.61* | *N* | - |

# 6.0 Environmental Laboratory Analysis

## 6.1 Environmental Analysis Rationale

Soil samples were selected for laboratory analysis following field screening, via visual and olfactory methods and PID readings. One groundwater sample was collected from each of the installed boreholes (CP101-CP104) on the first round of monitoring. The samples were collected using low flow techniques with a peristaltic pump and dedicated tubing. The wells were purged at a steady rate for 15 minutes and then the samples were collected.

Samples were analysed for contaminants associated with historical and current use of the site in line with guidance provided in CIRIA's Contaminated Land Risk Assessment: A Guide to Good Practice (CIRIA C552, 2001).

All samples were placed in laboratory provided containers and stored in cool boxes prior to being transported to the laboratory under the laboratory's chain of custody documentation. The laboratory used for the ground investigation on this occasion was I2 Analytical, a UKAS and MCERTS accredited laboratory.

The analysis scheduled for collected soil and groundwater samples is shown below in the table below.

| Analysis | Rational | Number of Samples Analysed | |
|---|---|---|---|
| | | Soil | Groundwater |
| Asbestos | Common potential contaminant of concern. | 8 | - |
| Heavy metals, Total Petroleum Hydrocarbons, Criteria Working Group Method (TPHCWG), Benzene, Toluene, Ethylbenzene and Xylene (BTEX), speciated Polycyclic Aromatic Hydrocarbons (PAH) | Common potential contaminants of concern. | 15 | 4 |
| Soil Organic Matter (SOM) | To allow comparison of soil results against their relevant assessment criteria. | 11 | - |
| Waste Acceptance Criteria (WAC) | To assist in preliminary off-site disposal routes. | 3 | - |

## 6.2 Soil Testing Results

The soil results have been assessed relating to potential risks to the human health receptor. Due to the site's proposed commercial redevelopment, soil testing results have been compared against

'Commercial' end use Generic Assessment Criteria (GACs) thresholds. GAC concentrations associated with a conservative 1% Soil Organic Matter (SOM) have been utilised.

No elevated concentrations of contaminants were recorded when compared against the GAC for a commercial end use, with respect to human health. The detailed results of laboratory analyses undertaken on soil samples are presented in Appendix D.

### 6.2.1 WAC Testing

Three samples were collected and scheduled for WAC analysis. The results of the testing are presented in Appendix D and should be passed to a haulier/receiving facility to determine what waste soils will be accepted as.

## 6.3 Groundwater Testing Results

### 6.3.1 Human Health

The groundwater results have been assessed relating to potential risks to the human health receptor. Due to the proposed redevelopment, the groundwater chemical data has been compared against a commercial/industrial end use GAC to assess risks from groundwater sources to indoor air and subsequent vapour inhalation indoors using Society of Brownfield Risk Assessment (SoBRA) vapour screening values.

None of the concentrations exceed the applied vapour screening values.

### 6.3.2 Controlled Waters

The groundwater results have been assessed relating to potential risks to controlled water receptors. The site is underlain by superficial River Terrace Deposits which are classified as a Secondary (Undifferentiated) Aquifer and the Wittering Formation in the east is a Secondary A Aquifer, however, given the proximity to the River Itchen and associated drainage channels/tributaries to the east, the groundwater testing results have been compared against inland surface water GAC thresholds (Water Framework Directive/Environmental Quality Standard).

The detailed results of laboratory analyses undertaken on groundwater samples are presented in Appendix E. Where contaminants have been identified in exceedance of laboratory limits of detection, and a surface water GAC is not available, a potable water GAC has been used where available and present in the table below.

| Contaminant | Maximum Concentration (µg/l) | GAC (µg/l) | GAC Source | Exceedance Location (Concentration (µg/l)) |
|---|---|---|---|---|
| **Metals** | | | | |
| Copper | 2.4 | 1 | WFD2015 | CP101 = 2.4<br>CP102 = 1.4<br>CP103 = 1.9 |
| Nickel | 12 | 4 | WFD2015 | CP102 = 12<br>CP103 = 8.4 |
| **Total Petroleum Hydrocarbons** | | | | |
| Aliphatic >C12-C16 | 1,600 | 300 | WHO 2008 | CP103 = 1,600 |
| Aromatic >C10-C12 | 120 | 90 | WHO 2008 | CP103 = 120<br>CP104 = 110 |
| Aromatic >C12-C16 | 700 | 90 | WHO 2008 | CP103 = 700<br>CP104 = 290 |
| Aromatic >C16-C21 | 1,000 | 90 | WHO 2008 | CP103 = 1,000<br>CP104 = 280 |
| Total TPH | 7,900 | 300 | Geo$^2$ | CP103 = 7,900<br>CP104 = 760 |
| Notes:<br>Geo$^2$ – Derived screening value based on professional experience.<br>WHO 2008 – World Health Organisation Petroleum Products in Drinking Water 2008<br>WFD2015 Water Framework Directive (Standards and Classification) Directions (England & Wales) 2015. | | | | |

Elevated concentrations of copper and nickel have been identified above the laboratory detection limits and above the applied generic assessment criteria. Additional assessment with respect to copper and nickel concentrations has been undertaken using the Water Framework Directive Metal Bio-Availability Assessment Tool (M-BAT). For the purpose of the assessment the following values have been used: calcium concentration of 100 mg/l, pH value of 7.27 and Dissolved Organic Carbon (DOC) of 10.4 mg/l. The values have been obtained from EA archival data for a monitoring point northeast of the site from the River Itchen (SO-G0003792) and Allington Stream (SO-G0006970). Given the age of the monitoring data conservative values have been adopted. An input of the maximum copper and nickel concentrations indicates bioavailable concentrations to be below the applied GAC.

Detectable concentrations of hydrocarbons have been identified within groundwater from CP103 and CP104 at a maximum concentration of 7,900 µg/l. These concentrations are greatly reduced compared to the third-party monitoring which recorded a maximum total TPH of 1,244,385 µg/l in F2 located c. 10 m east of CP103. This is potentially due the change in groundwater sampling method from bailers to the low flow technique used during this investigation. Free product has not been identified as part of this investigation, however, it was recorded within F2 and may have been entrained in the groundwater sample given the use of bailers. The low flow method used as part of this investigation would result in less sample disturbance and a reduction in the potential for volatilisation of contaminants. The identified hydrocarbons generally comprise longer chain C16-C35 fractions with some mid length fractions (C10-C16). High mobility short chain hydrocarbons or VOC contamination has not been identified at the site above laboratory detection limits from any boreholes during any of the sampling rounds undertaken.

Evidence of gross volatile contamination was not identified during screening of on-site soils, during return monitoring or within groundwater samples, as such, the risk is considered low.

# 7.0 Ground Gas Monitoring

## 7.1 Monitoring Duration

Monitoring wells were installed in four boreholes (CP101 to CP104). Monitoring has been undertaken on six occasions between 25th February 2025 and 15th July 2025.

## 7.2 Characteristic Situation

The presence of a hazardous ground gas source does not determine that a risk will be present. Whether a risk is present will be assessed through the potential for generation and subsequent migration of gas. Therefore, the gas concentrations will be considered alongside the recorded gas flows.

The Gas Screening Value (GSV) is the product of the maximum borehole flow rate and the gas concentration, per borehole across all monitoring visits completed. A Characteristic Situation (CS) can be derived from an assessment of the ground gas data and forms the basis of determining mitigation measures (as outlined in BS8485:2015+A1:2019).

## 7.3 Results

Detailed monitoring data from the visits is presented as Appendix C.

The barometric pressure was recorded during each monitoring visit, which ranged from 1012 mBar during Round 1 and 1029 mBar during Round 2. Round 1 and 4 were undertaken during periods of falling atmospheric pressure for the preceding three day trend.

Monitoring data obtained from the six rounds of monitoring is summarised in the table below.

| Monitoring Well | Response Zone (m bgl) | Max Flow (l/hr) | Max Methane Concentration % $^{v}/_{v}$* | Methane CS | Max Carbon Dioxide Concentration % $^{v}/_{v}$* | Carbon Dioxide CS | Flooded | Comments |
|---|---|---|---|---|---|---|---|---|
| **CP101** | 2.00 - 6.00 | *0.2* | *<0.1* | *CS1* | *9.7* | *CS1* | *N* | - |
| **CP102** | 1.00 - 6.00 | *0.2* | *<0.1* | *CS1* | *7.1* | *CS1* | *N* | - |
| **CP103** | 1.00 - 5.00 | *0.3* | *<0.1* | *CS1* | *13.6* | *CS1* | *N* | - |
| **CP104** | 1.0 5.50 | *0.2* | *<0.1* | *CS1* | *6.8* | *CS1* | *N* | - |

**Note:** * = Maximum Steady State Conditions

## 7.4 Discussion

### 7.4.1 Methane GSV

Methane was not identified above the instrument detection level (0.1%v/v) within any borehole during the monitoring. Maximum steady flow rates were detected as 0.3 l/hr and therefore has a calculated CS1 for methane (GSV = 0.0003).

### 7.4.2 Carbon Dioxide GSV

Carbon dioxide was identified at a maximum concentration of 13.6% v/v within CP103. Maximum flow detected was 0.3 l/hr and therefore has a calculated CS1 for carbon dioxide (GSV = 0.0198).

### 7.4.3 Conclusion

In accordance with BS8485 consideration should be given to increasing the characteristic situation to CS2 should methane exceed 1% v/v, or carbon dioxide exceed the threshold value of 5% v/v. The carbon dioxide threshold has been exceeded within all locations at concentrations between 1.1% v/v and 13/6 %v/v, however, the elevated concentrations were not associated with significantly elevated flow rates. Flows were generally found to be below the instrument detection level (0.1 l/hr) and at a maximum of 0.3 l/hr. Furthermore, the elevated carbon dioxide was accompanied by reduced oxygen concentrations, indicative of gas generation due to microbial activity on organic material. As such, in combination with the proposed development comprising a highway, it is recommended that the development remain as a Characteristic Situation 1, where no ground gas protection measures are required.

## 7.5 Organic Vapours

No sources of volatile vapours have been identified as part of the ground investigation.

# 8.0 Geotechnical Assessment

## 8.1 Geotechnical Analysis

### 8.1.1 Geotechnical Analysis Rationale

Alongside the environmental intrusive investigation undertaken across the site between 3rd and 6th February 2025, in-situ soil sampling and geotechnical laboratory analysis was undertaken to inform design. A summary of geotechnical testing is presented in the table below.

| Laboratory Test | Rational | Number of Samples |
|---|---|---|
| **Moisture Content** | For general classification, to assess plasticity and potential volume change of cohesive soils due to variations in moisture content. | 31 |
| **Liquid and Plastic Limits (Atterberg Test)** | | 4 |
| **Particle Size Distribution (PSD)** | For general classification and to assess suitability of soils for re-use in earthworks in accordance with the Specification for Highways Works (SHW). | 9 |
| **Bulk and Dry Density** | To inform the weight density of a soil for use in geotechnical design. Dry density can also be used to calculate void ratio, porosity, and saturation. | 18 |
| **Quick Undrained Triaxial** | To inform the undrained shear strength ($c_u$) of cohesive soils for use in geotechnical design. | 5 |
| **Hand Shear Vane** | | 3 |
| **Oedometer Consolidation** | To inform the coefficient of compressibility ($m_v$) and coefficient of consolidation ($c_v$) parameters for use in settlement calculation. | 1 |
| **Dry Density/Moisture content relationship** | To inform the maximum dry density and optimum moisture content relationship of a soil for use in earthworks design. | 7 |
| **California Bearing Ratio (CBR)** | To inform the CBR value of a soil for use in road and pavement design. | 12 |
| **Sulphate Suite and pH** | Obtained from the environmental test results to inform concrete design with respect to aggressive ground conditions. | 12 |

## 8.2 Geotechnical Testing

### 8.2.1 In-Situ Tests

Standard Penetration Tests (SPTs) were undertaken every 1.00 m up to a maximum depth of 4.00 m bgl and then every 1.50 m up to a maximum depth of 10.00 m bgl within the cable percussive boreholes.

A depth vs corrected SPT ($N_{60}$) plot is presented in Appendix A Figure 4. The graph generally shows an increase in strength with depth.

Soakaway testing was undertaken in three locations (TP103/SA101, TP104/SA102 and TP108/SA103) in accordance with BRE Digest 365 Soakaway design (2016) to derive soil infiltration rates for use in soakaway design. The results of the tests are summarised in the table below and test data is included within Appendix C.

| Location | Response Strata | Test Depth (m) | Infiltration Rate (m/s) | Permeability Classification/ Drainage Characteristics |
|---|---|---|---|---|
| **TP103/SA101** | River Terrace Deposits | 2.00 - 2.90 | $2.8x10^{-4}$ | Medium/Good |
| **TP104/SA102** | | 1.60 - 2.40 | $2.6x10^{-4}$ | Medium/Good |
| **TP108/SA103** | | 0.80 -1.20 | $8.0x10^{-6}$ | Low/Good |

### 8.2.2 Geotechnical Laboratory Results

A summary of the geotechnical test results is presented in the table below. Full details of the geotechnical results are presented in Appendix F.

| Parameter | No of Tests | Minimum | Maximum | Average |
|---|---|---|---|---|
| Made Ground | | | | |
| **pH** | 3 | 8.2 | 9.8 | 8.8 |
| **CBR (%)** | 2 | 0.6 | 0.9 | 0.8 |
| **Water soluble sulphate (mg/l)** | 3 | 10 | 400 | 162 |
| **Acid soluble sulphate (%)** | 3 | 0.019 | 0.104 | 0.053 |
| **Total sulphur (%)** | 3 | 0.012 | 0.047 | 0.027 |
| River Terrace Deposits | | | | |
| **pH** | 6 | 7.8 | 8.5 | 8.15 |
| **Water soluble sulphate (mg/l)** | 6 | 11 | 77 | 32 |
| **Moisture Content (%)** | 22 | 6.3 | 22.4 | 16.4 |
| **Plasticity Index (%)** | 2 | 20 | 22 | 21 |
| **Modified Plasticity Index (%)** | 2 | 19.6 | 21.8 | 20.7 |

| Parameter | | No of Tests | Minimum | Maximum | Average |
|---|---|---|---|---|---|
| Bulk Density ($Mg/m^3$) | | 14 | 1.86 | 2.19 | 2.03 |
| Dry Density ($Mg/m^3$) | | 14 | 1.61 | 2.0 | 1.71 |
| SPT '$N_{60}$' Value | | 13 | 12 | >62 | 33.5 |
| Undrained Shear Strength ($kN/m^2$) | From QUT's | 1 | 111 | | |
| Maximum Dry Density vs Optimum Moisture Content | MDD ($Mg/m^3$) | 7 | 1.81 | 2.05 | 1.97 |
| | OMC (%) | 7 | 9.1 | 14 | 11.1 |
| CBR (%) | Lab | 10 | 0.8 | 80^ | 16.27^ |
| Coefficient of volume compressibility | 100-200 kPa Range | 1 | 0.15 | | |
| ^One sample recorded high CBR value and is considered due to increased granular content. Removal of this sample indicates an average CBR of 2.8% | | | | | |
| London Clay Formation | | | | | |
| pH | | 3 | 8 | 8.3 | 8.2 |
| Water soluble sulphate (mg/l) | | 3 | 420 | 600 | 507 |
| Acid soluble sulphate (%) | | 3 | 0.044 | 0.055 | 0.05 |
| Total sulphur (%) | | 3 | 0.335 | 0.729 | 0.615 |
| Moisture Content (%) | | 7 | 28.2 | 37.1 | 32.9 |
| Plasticity Index (%) | | 2 | 41 | 43 | 42 |
| Modified Plasticity Index (%) | | 2 | 41 | 43 | 42 |
| Bulk Density ($Mg/m^3$) | | 4 | 1.88 | 1.98 | 1.92 |
| Dry Density ($Mg/m^3$) | | 4 | 1.37 | 1.53 | 1.44 |
| SPT '$N_{60}$' Value | | 10 | 20 | >64 | 32.5 |
| Undrained Shear Strength ($kN/m^2$) | Corelated from SPT $N_{60}$ | 10 | 81.4 | >282 | 143 |
| | Lab Shear Vane | 9 | 28 | 130 | 94 |

| Parameter | | No of Tests | Minimum | Maximum | Average |
|---|---|---|---|---|---|
| | From QUT's | 4 | 57 | 101 | 75 |
| Wittering Formation | | | | | |
| Moisture Content (%) | | 2 | 29.0 | 30.4 | 29.7 |

### Classification

Particle Size Distribution (PSD) testing using wet sieve techniques was carried out on five samples of River Terrace Deposits between 0.90 m bgl and 4.00 m bgl, which recorded the following constituents:

- *Cobbles: 0%;*
- *Gravel: 73% to 82%;*
- *Sand: 6% to 16%; and,*
- *Fines: 2% to 14%.*

In addition, a cohesive sample of the River Terrace Deposits was scheduled for wet sieve and sedimentation PSD testing within HP106 at 0.30 m bgl which recorded the following:

- *Cobbles: 0%;*
- *Gravel: 0%;*
- *Sand: 17%;*
- *Silt: 62%; and,*
- *Clay: 21%.*

PSD testing using wet sieve and sedimentation techniques was carried out on one sample of the London Clay Formation within CP103 at 4.20 m bgl which recorded the following constituents:

- *Cobbles: 0%;*
- *Gravel: 4%;*
- *Sand: 28%;*
- *Silt; 51%; and,*
- *Clay: 17%.*

PSD testing using wet sieve techniques was carried out on two samples of the Wittering Formation between 2.30 m bgl and 3.30 m bgl, which recorded the following constituents:

- *Cobbles: 0%;*
- *Gravel: 0% to 2%;*
- *Sand: 64% to 67%; and,*
- *Fines; 33% to 34%.*

Based on the calculated modified plasticity index the cohesive materials of River Terrace Deposits would classify as moderate volume change potential. The London Clay Formation would classify as high volume change in accordance with NHBC Standards, Chapter 4.2 'Building Near Trees'.

### Strength

The undrained shear strength value for the cohesive River Terrace Deposit indicates a stiff clay. This is likely due to the proportion of granular materials within the sample. The London Clay Formation shear strengths indicate a soft to very stiff/hard clay. Generally, the undrained shear strength indicate the London Clay to be stiff/high strength, consistent with field records.

### Compaction

The results of the compaction testing of the River Terrace Deposits indicate that the majority of samples have a natural moisture content wet of their optimum. This assumption is based upon a suitable acceptability criterion of 95% maximum dry density and 5% air voids.

### Compressibility

A single test on the cohesive materials of the River Terrace Deposits recorded a coefficient of volume compressibility ($m_v$) value of 0.15 $m^2$/MN in the 100-200 kPa stress range. This value is consistent with a medium compressibility clay.

## 8.3 Assessment Introduction

The study was undertaken as a preliminary investigation prior to proposed redevelopment of the site for a commercial/light industrial end use. The assessment focuses on the northern area of the site, along the route of the proposed access road. Further investigation will be required across the development area.

Based on the investigation to date the ground conditions comprise a limited thickness of Made Ground (in developed areas only), proven to a maximum depth of 1.50 m bgl followed by natural cohesive silts of the River Terrace Deposits to c. 1.50 m bgl followed by granular gravels to c. 5.00 m bgl. Across the eastern area the River Terrace Deposits were identified directly below topsoil. Bedrock of the London Clay Formation was identified as silt/sandy silt across much of the western and central northern areas to completion of the boreholes at 10.00 m bgl. The Wittering Formation

of sand and silt was identified below a limited thickness of River Terrace Deposits within two locations in the most eastern and most southern areas.

Groundwater was identified during drilling at depths between 2.70 m bgl and 4.40 m bgl within the River Terrace Deposits and at 7.90 m bgl to 8.00 m bgl within the London Clay Formation. Return monitoring of the installed wells recorded groundwater between 2.96 m bgl to 6.04 m bgl (6.59 m AOD to 9.90 m AOD).

## 8.4 Preliminary Assessment Assumptions

The following foundation assessment is considered to be preliminary in nature given the following limitations:

- No detailed building dimensions or design drawings have been provided to Geo$^2$ for review.

Therefore, the preliminary recommendations below will need to be revisited if any of the above information becomes available or assumptions change.

## 8.5 Adopted Ground Model & Geotechnical Parameters

The following table shows the preliminary anticipated ground model along the new access road and geotechnical parameters based of the findings of the intrusive investigation and subsequent testing.

| Stratum | Level at top of Stratum (m bgl) | Bulk Unit Weight, $\gamma_b$ (kN/m$^2$) | Undrained Shear Strength, $c_u$ (kN/m$^2$) | Effective Cohesion, c' (kN/m$^2$) | Angle of Friction φ' (°) | Co-efficient of Compressibility (m2/MN) |
|---|---|---|---|---|---|---|
| Northwestern Area | | | | | | |
| **Made Ground** | 0.00 | 18 | - | - | 27 | - |
| **River Terrace Deposits (Cohesive)** | 1.00 | 19 | 60 | 1 | 27 | 0.15 |
| **River Terrace Deposits (Granular)** | 2.00 | 18 | - | - | 33 | - |
| **London Clay Formation** | 4.50 | 20 | 95 | 5 | 31 | 0.1 |
| Central Northern Area | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **River Terrace Deposits (Cohesive)** | 0.30 | 19 | 60 | 1 | 27 | 0.15 |
| **River Terrace Deposits (Granular)** | 2.00 | 18 | - | - | 33 | - |
| **London Clay Formation** | 4.50 | 20 | 95 | 5 | 31 | 0.1 |

For the purposes of this assessment a design groundwater level of c. 3.50 m bgl (9.60 m AOD) has been adopted.

## 8.6 Earthworks

At the time of the investigation, cut and fill plans were not made available to Geo$^2$, however, given the road alignment, earthworks are likely to be required. It may be prudent to undertake further confirmatory earthworks classification and compaction testing prior to construction in order to develop an earthworks specification.

### 8.6.1 Earthworks Material Classification

The table below summarises material grading results and the corresponding earthworks class, in accordance with the 'Specification for Highways Works, Series 600', Table 6/2.

| Exploratory Location | Depth (m bgl) | Strata | Cobble Content (%) | Gravel Content (%) | Sand Content (%) | Fines <0.063 mm (%) | Series 600 Earthworks Class (Table 6/2) |
|---|---|---|---|---|---|---|---|
| CP102 | 3.00 | River Terrace Deposits - Granular | 0 | 73 | 15 | 12 | 1A & 1B |
| CP103 | 4.20 | London Clay Formation | 0 | 4 | 28 | 68 | 2A & 2B |
| CP104 | 4.00 | River Terrace Deposits - Granular | 0 | 82 | 16 | 2 | 1A & 1B |
| HP106 | 0.30 | River Terrace Deposits - Cohesive | 0 | 0 | 17 | 83 | 2A & 2B |

| Exploratory Location | Depth (m bgl) | Strata | Cobble Content (%) | Gravel Content (%) | Sand Content (%) | Fines <0.063 mm (%) | Series 600 Earthworks Class (Table 6/2) |
|---|---|---|---|---|---|---|---|
| TP101 | 2.30 | River Terrace Deposits - Granular | 0 | 76 | 10 | 14 | 1A & 1B |
| TP105 | 2.80 | River Terrace Deposits - Granular | 0 | 75 | 16 | 9 | 1A & 1B |
| TP109 | 3.30 | Wittering Formation | 0 | 2 | 64 | 34 | 2A & 2B |
| TP111 | 2.30 | Wittering Formation | 0 | 0 | 67 | 33 | 2A & 2B |
| TP112 | 0.90 | River Terrace Deposits - Granular | 0 | 80 | 6 | 14 | 1A & 1B |

Shallow earthworks on the site will likely predominantly encounter Made Ground and River Terrace deposits in the proposed roadway area. The River Terrace Deposits are likely to fall into Class 1A & 1B for the cohesive materials and 2A & 2B for the granular materials.

### 8.6.2 Compaction Results

The results of the compaction testing of the River Terrace Deposits indicate that the majority of samples have a natural moisture content wet of their optimum. This assumption is based upon a suitable acceptability criterion of 95% maximum dry density and 5% air voids.

Materials used as fill will need to be placed to a suitable engineering specification with the degree of compaction required will be dependent on end usage and serviceability criteria. For example, a lesser degree of compaction may be suitable for paved areas than for building platforms supporting foundations and ground bearing slabs.

The suitability of earthworks materials has been assessed on the basis of the testing carried out as part of this investigation. The materials encountered on-site may vary from those analysed; furthermore, inclement weather or winter working may result in materials being unsuitable for incorporation within the works without modification by lime, cement or other methods. In particular, cohesive soils are very susceptible to 'wet weathering working' and may require a reduction in moisture content via stabilisation techniques. These may include the use of lime and / or cement, however trials would first have to be undertaken to determine the suitability of potential techniques and acceptable mixes.

Unprotected stockpiled materials often deteriorate due to water infiltration, and they may become unsuitable for incorporation in the works.

Further earthworks testing may be required prior to completion of a suitably detailed earthworks specification for the works.

## 8.7 Roads and Pavements

The table below summarises the laboratory CBR results undertaken as part of this assessment.

| Exploratory Location | Depth (m bgl) | Strata | CBR Values (%) | | |
|---|---|---|---|---|---|
| | | | Top (%) | Base (%) | Average (%) |
| CP102 | 0.40 | Made Ground | 0.6 | 0.7 | - |
| CP103 | 0.30 | River Terrace Deposits - Cohesive | 1.9 | 1.5 | - |
| CP103 | 2.00 | River Terrace Deposits - Granular | 60 | 80 | - |
| CP104 | 0.50 | River Terrace Deposits - Cohesive | 1.4 | 1.2 | 1.3 |
| CP104 | 200 | River Terrace Deposits - Granular | 0.6 | 0.9 | - |
| HP102 | 0.50 | Made Ground | 1.6 | 2.2 | - |
| TP101 | 0.80 | River Terrace Deposits - Cohesive | 2.2 | 2.1 | 2.2 |
| TP102 | 0.80 | River Terrace Deposits - Cohesive | 1.3 | 1.2 | 1.3 |
| TP104 | 0.60 | River Terrace Deposits - Cohesive | 2.0 | 1.8 | 1.9 |
| TP105 | 0.50 | River Terrace Deposits - Cohesive | 1.3 | 1.2 | 1.3 |
| TP107 | 0.60 | River Terrace Deposits - Cohesive | 0.8 | 0.8 | 0.8 |
| TP108 | 0.80 | River Terrace Deposits - Granular | 1.1 | 0.9 | - |

Based on the testing undertaken it is recommended that a conservative CBR value of 1 % should be adopted for the shallow Made Ground and cohesive materials of the River Terrace Deposits. Variable results have been recorded within the granular River Terrace Deposits ranging between 0.6 % to 80 %, therefore it is recommended that a conservative value of 2 % be adopted for the granular materials. All materials should be thoroughly proof rolled.

Further in-situ plate CBR tests testing may be required at formation level prior to finalising pavement design. All materials within 450mm of final finished levels in roads or pavement should comprise non-frost-susceptible soils in accordance with BS 812-124.

## 8.8 Foundation Assessment

The study was undertaken as a preliminary investigation prior to proposed redevelopment of the site for a commercial/light industrial end use. The assessment focuses on the northern area of the site, along the route of the proposed access road. Limited investigation has been undertaken across the wider site; however, initial foundation recommendations are below. Further investigation will be required in due course for use in design.

### 8.8.1 Spread Foundations

Based on the investigation to date the Made Ground and shallow cohesive River Terrace Deposits are considered unsuitable as a founding stratum for shallow foundations without further re-engineering or ground improvement. Should granular materials of the River Terrace Deposits be encountered within economical reach for traditional foundations then an allowable bearing capacity of 150 kPa (with settlement limited to 25 mm) is considered suitable for pad sizes up to 3 m x 3 m. In the southern area of the site shallow bedrock materials of the Wittering Formation have been identified, further investigation will be required to determine the potential use of shallow foundations in this area.

Consideration should be given to ensure that foundations across the building footprint are cast in uniform strata in order limit the potential for differential settlement. All foundation excavations should be inspected by a suitably qualified engineer prior to casting to ensure the appropriate depth, founding medium and strength characteristics have been achieved.

### 8.8.2 Floor Slabs

Based on the investigation to date a ground bearing floor slab may be suitable for the proposed commercial/industrial buildings within natural materials of the River Terrace Deposits. All unsuitable materials (Made Ground, Topsoil and soft zones) should be removed and replaced with engineered granular fill as required. Further investigation will be required beneath the proposed building footprints to determine ground and groundwater conditions.

### 8.8.3 Piles

Given the limited investigation across the development area and proximity to the River Itchen in the east (with the potential for soft alluvial soils), the potential use of piles cannot be discounted at this stage.

The responsibility for pile design, installation and applicability of any proprietary systems shall sit with the specialist piling contractor who should undertake their own assessment of pile capacities and the performance of pile groups and provide a warranted design based on the results of this and, if necessary, subsequent investigations. Should discussions with piling or ground improvement contractors identify piled foundations needing to extend below the depth of the current investigation, then additional investigation may be required.

Normal static and dynamic load testing should be considered to achieve satisfactory quality control/assurance in accordance with good practice. Additionally, there will be a requirement for the placement of a suitably engineered piling mat, which should be designed and validated by a suitably qualified and experienced engineer, in accordance with BRE 470 'Working Platforms for Tracked Plant'.

## 8.9 Ground Improvement

Ground improvement could be feasible to densify shallow soils beneath any proposed structures within the wider site area in order to achieve suitable allowable bearing pressures and reduce the potential for differential settlement beneath traditional foundations and ground bearing floor slabs. This could be undertaken by Vibro replacement techniques such as Vibro Stone Columns (VSC) or Rigid Inclusions.

These techniques improve the near surface ground conditions by creating a column of unreinforced stone/concrete material to laterally displace or replace the near surface soils thereby stiffening the soil mass and reducing post construction settlements. These columns would be installed on a closely spaced grid, within and partially beyond the footprint of the proposed structures to be supported and extend down to the River Terrace Deposits. It is considered that ground improvement via this method in conjunction with a load transfer platform may be feasible to improve the strength characteristics of the loose / low strength shallow soils to allow the adoption of traditional foundations bearing within these strata for lightly loaded structures. This would also reduce the potential for excessive total and/or differential settlement.

Due to variations in installation technique, it is recommended that a ground improvement contractor be consulted to determine suitability of the ground conditions, the most suitable technique, the likely improvement which may be achieved and costs for the differing techniques. Rigid inclusions/CMC's can be affected by buried obstructions and pre-drilled/probing maybe required. These techniques rely on some inherent strength within the host soil to prevent the finished stone/concrete column from "barrelling" which may result in lower column performance and onerous long term settlements. Such issues would need to be discussed in advance of any detailed design work to ensure the proposed improvement technique is feasible.

If ground improvement via this technique is adopted then an appropriate working platform should be designed and constructed in accordance with BRE Digest 470 (Working Platforms for Tracked Plant) if such techniques are to be employed.

## 8.10 Volume Change Potential

The volume change potential should be considered in the design for foundation, floor slabs and services with respect to desiccation and tree planting.

The cohesive materials of the River Terrace Deposits have been identified as low to medium volume change potential. A medium volume change should be adopted for design at this stage. The London Clay Formation has been recorded as high volume change potential. Any proposed tree planting at

the site should be undertaken in accordance with NHBC Part 4.2 - Building Near Trees to ensure minimum foundation depths are achieved.

### 8.11 Chemical Attack on Buried Concrete

In accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' 2005, the conditions of the shallow Made Ground and natural River Terrace Deposit soils at the site would therefore be classified as Design Sulphate Class DS-1 and ACEC Class AC-1 for soils and groundwater, when considering the most appropriate type of concrete to be used at the site for shallow foundations in order to resist chemical attack from elevated sulphate present in the soils (assuming mobile groundwater in non-pyritic soils).

Should a deeper pile solution be adopted, in accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' 2005, the conditions of the London Clay Formation would be classified as Design Sulphate Class DS-4 and ACEC Class AC-3s soils and groundwater (assuming static groundwater in potentially pyritic soils).

The central northern area of the site is impacted by hydrocarbon contamination in groundwater. This contamination has the potential to adversely effect curing times and final strength of concrete placed in the ground. Appropriate mitigation of soil and groundwater contamination should be considered by foundation designers for any concrete structures which may come into contact with groundwater in this area.

### 8.12 Excavation, Support and Earthworks

Shallow ground conditions on the site have generally been identified as Made Ground followed by cohesive silts and clayey sandy gravels, as such, it should be assumed that shallow excavations on site are unstable and may need support in accordance with CIRIA 97 Trenching Practice. Side support for safety purposes should of course be provided to all excavations which appear unstable. In accordance with Health and Safety Regulations, a competent person who fully understands the dangers and necessary precautions should inspect an excavation of any depth at the start of each shift and after any event that may have affected the strength or stability of the excavation.

Excavation through layers of Made Ground and superficial deposits should be feasible using conventional site plant. No evidence of obstructions was noted during the works, however, there are known services in the north and previous development in the south. Therefore, some breaking out and removal of obstructions may be required prior to redevelopment. The presence of buried obstructions should be considered further with respect to any deep piled or ground improvement techniques adopted at the site as obstructions can hinder design and installation.

### 8.13 Groundwater

Groundwater was identified during drilling at depths between 2.70 m bgl and 4.40 m bgl within the River Terrace Deposits and at 7.90 m bgl to 8.00 m bgl within the London Clay Formation. Return monitoring of the installed wells recorded groundwater between 2.96 m bgl to 6.04 m bgl (6.59 m

AOD to 9.90 m AOD). Previous third-party monitoring of on-site boreholes recorded levels at c. 3.00 to 9.00 m AOD. Groundwater would be anticipated within excavations into the granular River Terrace Deposits at c. 3.50 m bgl (9.60 m AOD).

Excavations below the water table are likely to be quickly inundated, groundwater control or exclusion measures will need to be considered.

### 8.14 Drainage

The results of the soakaway testing indicate that the underlying granular River Terrace Deposits have good drainage potential and drainage to land may be feasible for the access road. Consideration should be given to the underlying groundwater table as part of drainage design.

### 8.15 Slopes and Retaining Features

It is recommended for any existing or proposed slopes which exceed 1(v):3(h), or are significantly loaded, should be subject to a detailed full slope stability assessment. When the final alignment and design of any retaining features are known, they should be subject to appropriate geotechnical design for bearing capacity, sliding and overturning.

### 8.16 Geotechnical Risk Register

The following scoring system used in the risk register is provided in the tables below.

| Probability | (P) | | Impact | (I) | | (R) | Risk | Risk Rating |
|---|---|---|---|---|---|---|---|---|
| Almost Certain | 5 | | Catastrophic | 5 | | 20-25 | Severe | Critical. Risk must be addressed. |
| Extremely Likely | 4 | X | Major | 4 | = | 25-19 | Substantial | Intolerable and work must not start on the project until risk has been reduced, project should not proceed. |
| Likely | 3 | | Serious | 3 | | 10-14 | Moderate | Substantial and work must not start until risk has been reduced. |
| Unlikely | 2 | | Moderate | 2 | | 5-9 | Minor | Significant but tolerable. Must |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | consider improvements. |
| Extremely Unlikely | 1 | Minor | 1 | 1-4 | Negligible | Trivial, but no action required. | |

*Navigator Quarter, Southampton: Preliminary Sources Study Report (Ref.24/4362.A.2.PSSR)*

| Hazard | Risk Description | Consequence | Risk Rating Before Control | | | Risk Management Measures | Risk Rating After Control | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | P | I | R | | P | I | R |
| **Ground Model** | Ground conditions not as anticipated from review of BGS boreholes and previous reports. | Destabilise earthworks, inadequate foundation/pavement design. Risks to cost & programme. | 3 | 3 | 9 | Use site specific data in design of geotechnical structures. | 3 | 2 | 6 |
| | Soft compressible materials associated within infilled pit in the northwestern area. | Potential for poor ground conditions to be encountered and to change over relatively short distances. | 3 | 3 | 9 | Use site specific data in design of geotechnical structures. Data gaps exist due to site constraints during investigation. Additional investigation to be considered. | 3 | 2 | 6 |
| **Changes in level** | Potential requirement for soil removal along the northern boundary of the site. | Need for removal of soils for the proposed access road. Risks to cost, programme and health and safety (unknown material composition). | 3 | 3 | 9 | Testing of materials proposed for off-site disposal has been undertaken. | 3 | 1 | 3 |
| | Requirement for soil retention or slopes may be required. | Slope/Retaining structures may be required. Structures will require appropriate design. | 3 | 3 | 9 | Review final earthworks levels when known to determine if slopes/retaining features are required. Any required Earthworks/slopes will be designed at 1:3 gradients. Detailed design of slopes, earthworks and retaining structures required to be based on available ground investigation. | 3 | 2 | 6 |

| Hazard | Risk Description | Consequence | Risk Rating Before Control | | | Risk Management Measures | Risk Rating After Control | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | P | I | R | | P | I | R |
| **Utilities** | Several third-party utilities have been identified on site including a high pressure gas main, electric, telecoms and sewerage. | Utilities require identifying prior to ground investigation.<br><br>Risk to cost and project timescales if utilities require diversion. | 5 | 5 | 25 | Design to account for diversion and protection of utilities as required. | 3 | 2 | 6 |
| **Contaminated land** | Previous third party reports have identified hydrocarbons in the groundwater in the northern central area of the site associated with the off-site rail yard. | Risk of ill health to workers and buried concrete. Risk to costs if sulphate resistant concrete required for substructures. | 3 | 4 | 12 | Elevated hydrocarbons have been identified as part of the investigation. Good hygiene practices to be observed during construction. | 3 | 2 | 6 |
| | Aggressive in ground geo-chemistry. | Risk to costs if sulphate resistant concrete required for substructures. | 3 | 2 | 6 | Suitable concrete grade and classifications to be utilised with results from ground investigation data. | 2 | 2 | 4 |
| **Groundwater** | Depth to groundwater may be within excavation depth of earthworks or foundations. | Additional costs of project due to foundation depth, earthworks, temporary works or inadequate design.<br><br>Time delays. | 2 | 4 | 8 | Appropriate design undertaken using results of ground investigation data. | 2 | 2 | 4 |

| Hazard | Risk Description | Consequence | Risk Rating Before Control | | | Risk Management Measures | Risk Rating After Control | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | P | I | R | | P | I | R |
| **Drainage** | Risk of unsuitable soils and/or high groundwater table precluding the use of drainage to land. | Additional costs of project due to drainage design. | 3 | 2 | 6 | Appropriate design undertaken using results of ground investigation data. | 2 | 2 | 4 |
| **Ecology/ Environmental Issues** | Vegetation clearance may be required prior to ground investigation or any construction phase works. | Delays to project if ecological works required. Possible impact on foundation design if trees remain/removed or new planting proposed. | 2 | 4 | 8 | Environmental considerations already discussed in wider project team reports. Recommendations detail in reports to be followed prior to and during construction. | 2 | 2 | 4 |

# 9.0 Risk Estimation

## 9.1 Qualitative Risk Assessment

Each of the identified potential contamination linkages in the preliminary conceptual site model is reviewed based upon the findings of the site investigation which allows a greater understanding of the ground conditions at the site, site observations, soil and groundwater quality and chemical analysis.

The qualitative risk assessment is undertaken, detailed in the table on the following page, in line with guidance provided in CIRIA's Contaminated Land Risk Assessment: a guide to good practice CIRIA C552, 2001. The purpose of this assessment is to determine the relative significance of the identified contamination linkages by assessing the probability of an impact occurring and by assessing the perceived severity of an impact to a receptor.

The perceived risk is based on a consideration of both the likelihood of an event (probability) occurring, and the severity of the potential consequence. Classification of these two factors is detailed in Appendix G.

Those linkages considered of low risk or less on the basis of the available site data will not be considered any further in this assessment. Linkages considered to be more significant are identified as presenting potentially unacceptable risk to the identified receptor. In these instances, further works may be considered necessary.

| Source(s) | Pathway(s) | Receptor(s) | Risk | Comments/Mitigation |
|---|---|---|---|---|
| Potential contamination in areas not directly investigated.<br>Elevated metals and hydrocarbons within groundwater. | Direct contact, ingestion and/or inhalation of soil/dust | Human health – future site users | **Very Low Risk (Unlikely x Mild)** | None of the contaminant concentrations reported in soil exceeded the relevant Generic Assessment Criteria (GAC). Therefore, the soil contaminant concentrations are not considered likely to represent a risk to human health based on the proposed highway development in the north.<br>Further investigation will be required across the main development area. |
| | | Human health – construction workers | **Low Risk (Low x Mild)** | Site workers may become exposed to localised contaminated soils and shallow groundwater during intrusive groundworks undertaken at the site. Safe working practices should be undertaken and appropriate Personal Protective Equipment (PPE) should be used to reduce the risk to low.<br>No evidence of volatile contamination has been identified associated with the northern highway area.<br>Further investigation will be required across the main development area. |
| | Migration of contaminants into controlled waters | Underlying Secondary Undifferentiated Aquifer (River Terrace Deposits) and Secondary A Aquifers (Wittering Formation and Alluvium [if present]).<br>The River Itchen and associated tributaries to the east. | **Moderate / Low (Low Likelihood x Medium)** | Elevated hydrocarbons are present within groundwater in the central northern area, understood to be migrating from the off-site rail yard from the north. Although no evidence of free product has been identified as part of this assessment, previous third-party monitoring has recorded Light Non-Aqueous Phase (LNAPL) product up to 15 mm in thickness. It is understood that this |

| Source(s) | Pathway(s) | Receptor(s) | Risk | Comments/Mitigation |
|---|---|---|---|---|
| | | Human health – future site users | **Low Risk (Low x Mild)** | contamination is being monitored and assessed by others.<br>With respect to the proposed highway, excavations are not anticipated to extend to the water table in this area of the site and as such the known hydrocarbons are not considered to represent a risk to construction workers, however, should remediation be required in this area, this should be considered in combination with the scheme timeline and access restrictions.<br>No evidence of volatile contamination has been identified.<br>Further investigation will be required across the wider development area. |
| | | Human health – construction workers | **Low Risk (Low x Mild)** | |
| Organic contamination in soils and groundwater | Direct infiltration in water supply pipes | Drinking water supply pipes | **Moderate (Likely x Medium)** | Hydrocarbons, especially aromatics, are known to permeate plastic pipes. Assessment of the risk to water pipes for any new supply will have to be undertaken as a requirement of the statutory undertakers, who should be provided with a copy of this Assessment and provide recommendations for upgrading of potable water supply pipes. |

| Source(s) | Pathway(s) | Receptor(s) | Risk | Comments/Mitigation |
|---|---|---|---|---|
| Ground Gas | Indoor exposure/explosive hazard via enclosed space accumulation of ground gas | Future site users | **Moderate / Low (Low Likelihood x Medium)** | Following completion of six rounds of monitoring the development has been classified as a CS1, whereby ground gas protection measures are not required. Further assessment will be required across the wider development area.<br>The site is in a low (less than 1% of homes are estimated to be at or above the Action Level) to intermediate probability radon area (up to 3 to 5% of homes are estimated to be at or above the Action Level). Given the site is located within two probability areas, it is recommended that the requirement for radon protective measures is confirmed with the Local Authority / Building Control. At this stage it would be prudent to allow for basic radon protective measures within new buildings. |

# 10.0 Conclusions and Recommendations

## 10.1 Conclusions

A Geo-Environmental Assessment of the site known as Navigator Quarter, Southampton was undertaken, prior to the development of a new access road in the northern area.

The study was undertaken as a preliminary investigation prior to proposed redevelopment of the site for a commercial/light industrial end use. The assessment focuses on the northern area of the site, along the route of the proposed access road. Further investigation will be required across the development area.

### 10.1.1 Contaminated Land Considerations

The site has a long history associated with aircraft use, from Eastleigh Airfield in the early 1900s to forming part of Southampton International Airport. Surrounding land uses include a rail yard to the north, Southampton Airport (runway, terminals and commercial premises) to the west and the River Itchen SSSI and conservation area to the east.

No significant potential sources of contamination have been identified, and widespread or significant contamination of the soils has not been identified, as such the risk to future site users is considered to be **Very Low** across the access road area.

Elevated concentrations of metals have been identified across the proposed roadway area within groundwater and elevated hydrocarbons were also identified in the central northern area. Hydrocarbons are known to be present within groundwater in this area, understood to be migrating from the rail yard to the north. This contamination is monitored and assessed by a third-party who should be consulted for further details. The risk to construction workers and future site users is considered to be **Low** across the access road area.

Evidence of gross volatile contamination was not identified during screening of on-site soils, during return monitoring or within groundwater samples.

Following completion of six rounds of monitoring the development has been classified as a CS1, whereby ground gas protection measures are not required across the access road area. Further assessment will be required across the wider development area.

Limitations are discussed in Section 5.1.1.

### 10.1.2 Geotechnical Considerations

Based on the investigation to date the ground conditions comprise a limited thickness of Made Ground (in developed areas only), proven to a maximum depth of 1.50 m bgl followed by natural cohesive silts of the River Terrace Deposits to c. 1.50 m bgl followed by granular gravels to c. 5.00 m bgl. Across the eastern area the River Terrace Deposits were identified directly below topsoil. Bedrock of the London Clay Formation was identified as silt/sandy silt across much of the western

and central northern areas to completion of the boreholes at 10.00 m bgl. The Wittering Formation of sand and silt was identified below a limited thickness of River Terrace Deposits within two locations in the most eastern and most southern areas.

Groundwater was identified during drilling at depths between 2.70 m bgl and 4.40 m bgl within the River Terrace Deposits and at 7.90 m bgl to 8.00 m bgl within the London Clay Formation. Return monitoring of the installed wells recorded groundwater between 2.96 m bgl to 6.04 m bgl (6.59 m AOD to 9.90 m AOD).

Based on the testing undertaken it is recommended that a conservative CBR value of 1 % should be adopted for the shallow Made Ground and cohesive materials of the River Terrace Deposits. Variable results have been recorded within the granular River Terrace Deposits ranging between 0.6 % to 80 %, therefore it is recommended that a conservative value of 2% be adopted for the granular materials.

Shallow traditional foundations may be suitable for the proposed commercial development; however, further investigation will be required to determine the ground conditions.

## 10.2 Recommendations

The following measures are recommended to address the identified risks and facilitate future redevelopment:

- Given the access constraints identified during the works, additional investigation may be required for detailed design of the highway;
- Further investigation will be required across the main development area to advise on the risk to future site users, controlled waters and provide information for geotechnical design;
- Site users during the redevelopment of the site should be advised during toolbox talks of the possibility of encountering contaminated soils. Appropriate levels of Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) should be implemented as and when needed;
- If required, production of a Materials Management Plan (MMP) to facilitate sustainable materials re-use;
- Basic Radon protection measures may be required within new buildings constructed at the site;
- The Local Water Authority should be contacted to advise whether they will require the installation of upgraded pipework for new services at the site;
- When areas of soils to be removed from site are identified, e.g. service trenches, surface water attenuation, additional sampling, analysis and assessment should be undertaken to

inform off-site management routes. Waste classification was not undertaken as part of the scope of works; and,

- Further sampling and testing may be required to confirm geotechnical and contaminative suitability of soils for use in detailed earthworks design.

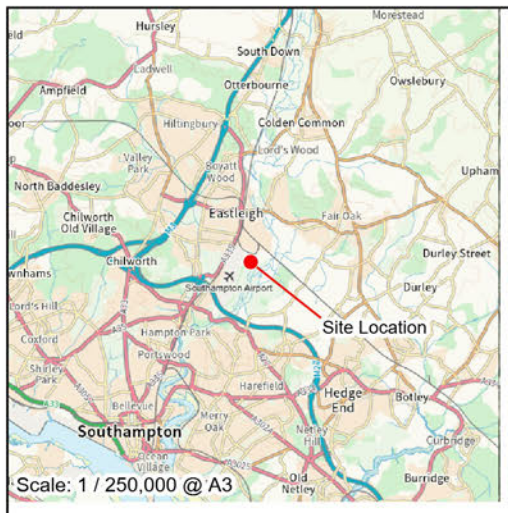
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# Appendix A – Drawings and Figures




Site Boundary



| | | |
|---|---|---|
| 0 | 300 | 600 |
| 900 | 1,200 | 1,500 |
| 1,800 | 2,100 m | |

N

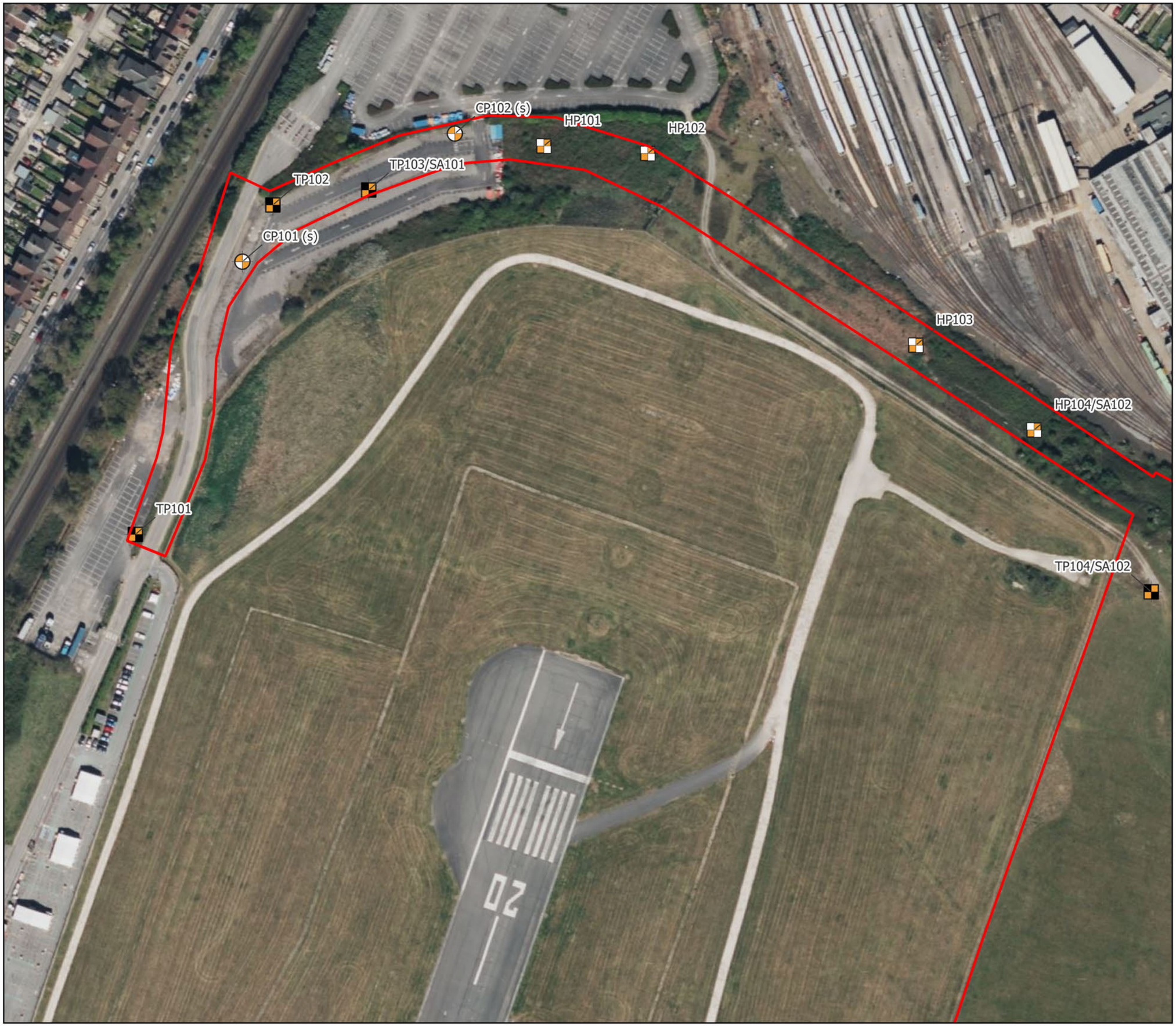
DO NOT SCALE. NOT FOR CONSTRUCTION

| | | |
|---|---|---|
| Figure: Site Location Plan | | |
| Job: Navigator Quarter, Southampton | | |
| Client: Blocwork (Eastleigh) LLP and AGS Airports Group Limited | | |
| Figure No.: 1 | Revision: 1 | Date: 07 February 2025 |
| Drawn by: JCR | Checked by: TH | Scale: 1:15,000 |
| Job No.: 4362 | | |

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## Legend

Site Boundary

*SI Locations*

CP - Cable Percussion Borehole
(s) - Standpipe Installation

TP - Trial Pit

HP - Hand Dug Pit

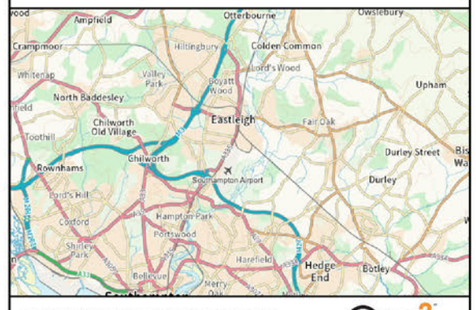
0 10 20 30 40 50 m

N

| | |
|---|---|
| Figure | Intrusive Location Plan |
| Job | Navigator Quarter, Southampton |
| Client | Blocwork (Eastleigh) LLP and AGS Airports Group Limited |

| Figure No. | Revision | Date |
|---|---|---|
| 2A | 1 | 07 February 2025 |
| **Drawn by** | **Checked by** | **Scale** |
| JCR | TH | 1:1,500 |

Job No. 4362




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## Legend

- Site Boundary

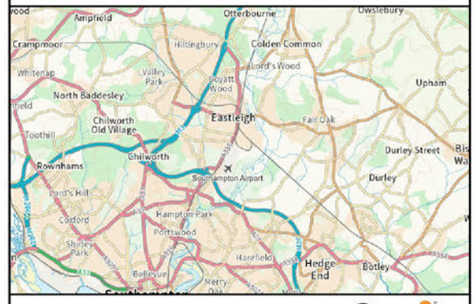
*SI Locations*

- CP - Cable Percussion Borehole
- (s) - Standpipe Installation
- TP - Trial Pit
- HP - Hand Dug Pit

0 30 60 90 120 150 m

N

| | | |
|---|---|---|
| Figure: Intrusive Location Plan | | |
| Job: Navigator Quarter, Southampton | | |
| Client: Blocwork (Eastleigh) LLP and AGS Airports Group Limited | | |
| Figure No.: 2B | Revision: 1 | Date: 07 February 2025 |
| Drawn by: JCR | Checked by: TH | Scale: 1:3,000 |
| Job No.: 4362 | | |




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## Legend

- Site Boundary

*Services*

- Foul
- Gas - HP
- Fibre Optic
- LV Electric
- Abandoned Foul
- Gas Main 15m Easement

*Access Constraints*

- No drill due to height restructions during active hours adjacent to runway
- Dense vegetation

0 30 60 90 120 150 m

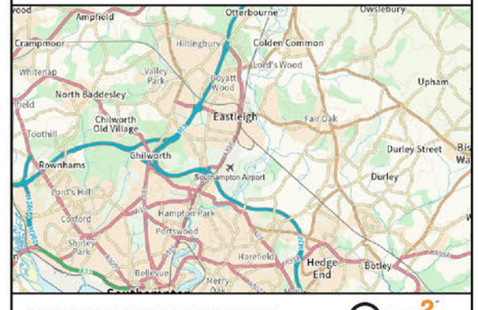
N

| | |
|---|---|
| Figure | Constraints Plan |
| Job | Navigator Quarter, Southampton |
| Client | Blocwork (Eastleigh) LLP and AGS Airports Group Limited |

| Figure No. | Revision | Date |
|---|---|---|
| 3 | 1 | 13 March 2025 |
| **Drawn by** | **Checked by** | **Scale** |
| JCR | TH | 1:3,750 |

Job No.

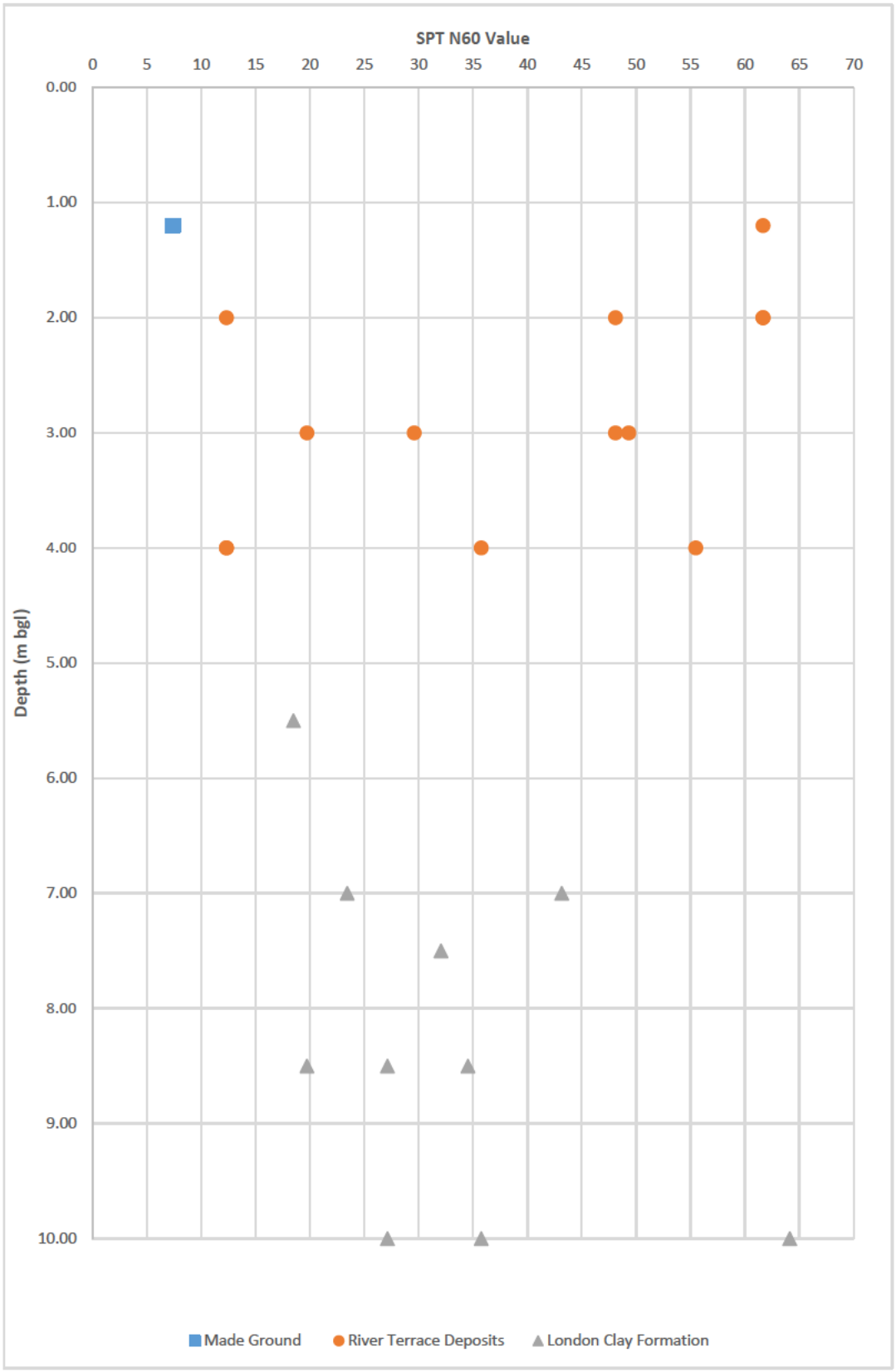
4362




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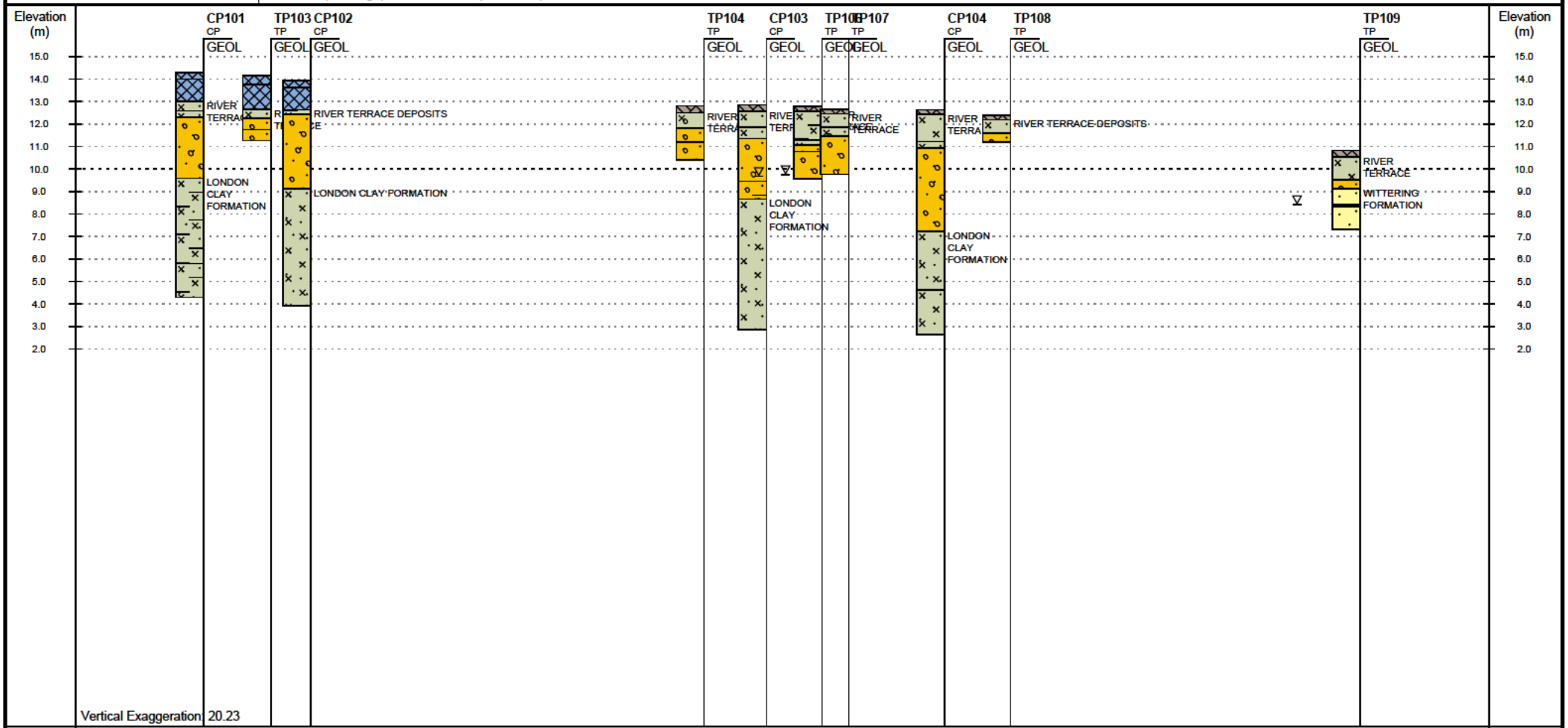



| | | | |
|---|---|---|---|
| Geo2™ | TITLE: Corrected SPT $N_{60}$ Values vs Depth Plot (m bgl) Navigator Quarter | DWN: JCR | PROJECT NO.: 4362 |
| | | DATE: 21.03.2025 | Figure: 4 |

# Cross-Section

| Project Name | Project No. | Vertical Scale | Horizontal Scale |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 1:250 | 1:5058 |

| Client | Contractor | Consultant |
|---|---|---|
| Blocwork (Eastleigh) Ltd and AGS Airports Group Limited | FW Pammenter & Son | MOK/JCR |




TOPSOIL | MADE GROUND | SILT | CLAY/SILT | SAND | GRAVEL

WATER LEVELS

REST

STRIKE

Pipe / Installation Details Omitted

Created using Pebble Geo

# Appendix B – Exploratory Hole Logs

# Key to exploratory hole symbols and abbreviations

## SAMPLE TYPES

ACM - Asbestos sample
AMAL - Amalgamated sample
B - Bulk disturbed sample
BLK - Block sample
C - Core sample
CBR - CBR test sample
D - Disturbed sample
ES - Environmental sample
EW - Environmental water sample
G - Gas sample
J - Jar sample
L - Liner sample
TW - Pushed thin wall sample
U - Undisturbed sample
UT - Undisturbed thin wall sample
W - Water sample

## IN-SITU TESTS

HV - Hand shear vane
HV(r) - Hand shear vane residual
PID - Photo ionisation detector
PP - Hand penetrometer
SPT - Standard penetration test
SPT(C) - SPT using cone

## GROUNDWATER

Groundwater strike
Groundwater rest level

## ROTARY CORE DETAILS

TCR - Total core recovery (%)
SCR - Solid core recovery (%)
RQD - Rock quality designation (%)
FI - Fracture index
NI - Non-intact core
AZCL - Assumed zone of core loss

## LEGEND

Topsoil
Peat
Made ground [cohesive]
Concrete
Wood
Brick
Bituminous material
Gypsum
Coal
Void
Clay
Silt
Sand
Gravel
Cobbles
Boulders
Mudstone
Siltstone
Sandstone
Limestone
Chalk
Breccia
Conglomerate
Metamorphic
Igneous
Sand backfill
Gravel backfill
Arisings
Bentonite
Concrete
Grout
Plain pipe
Slotted pipe

Created using Pebble Geo

# Trial Pit

**TP101**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 445364.21 | 117821.60 | 13.62 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | 13.59 | (0.03) 0.03 | | MADE GROUND: Macadam. |
| | | 0.20<br>0.20 - 0.30 | ES 1<br>D 1 | | | (0.47) | | MADE GROUND: Light brown sandy angular to sub-angular fine to coarse brick, quartzite and mudstone GRAVEL. Sand is fine to coarse. |
| | | | | | 13.12 | 0.50 | | Light grey slightly sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | 0.80 - 1.00 | B 1 | | | (1.00) | | |
| | | | | | 12.12 | 1.50 | | Light brown slightly sandy clayey angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 2.30 - 2.50 | B 2 | | | (1.20) | | |
| | | | | | 10.92 | 2.70 | | Orangish brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand Is fine to coarse. Rare angular quartzite cobbles. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.80) | | |
| | | | | | 10.12 | 3.50 | | *End of Trial Pit at 3.50m* |

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Trial Pit remained dry upon completion. 5. Trial Pit remained stable upon completion.

**Method, Plant, Stability, Dimensions**
**0.00 - 3.50m** TP JCB 3CX
*L = 1.60m*
*W = 0.60m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Trial Pit

**TP102**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 445426.27 | 117962.91 | 14.34 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.25) | | MADE GROUND: Greyish brown sandy angular to sub-angular fine to coarse limestone GRAVEL. Sand is fine to coarse. |
| | | | | | 14.09 | 0.25 | | MADE GROUND: Grey slightly sandy SILT. Sand is fine to medium. Rare angular to sub-rounded fine to medium brick and quartzite gravel. |
| | | 0.50 - 0.60 | ES 1 | | | (0.55) | | |
| | | 0.80 - 1.00 | B 1 | | 13.54 | 0.80 | | Light brown slightly sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | | | | | (1.60) | | |
| | | | | | 11.94 | 2.40 | | |
| | | | | | | (0.10) | | Brown slightly clayey sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 2.60 - 2.80 | B 2 | | 11.84 | 2.50 | | Light brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. Rare sub-angular to sub-rounded quartzite cobbles. [RIVER TERRACE DEPOSITS] |
| | | | | | | (1.00) | | |
| | | | | | 10.84 | 3.50 | | *End of Trial Pit at 3.50m* |

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Trial Pit remained dry upon completion. 5. Trial Pit remained stable upon completion.

**Method, Plant, Stability, Dimensions**
**0.00 - 3.50m** TP JCB 3CX
*L = 1.70m*
*W = 0.60m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Trial Pit

**TP103**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 445465.96 | 117969.39 | 14.16 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.40) | | MADE GROUND: Greyish brown sandy angular to sub-angular fine to coarse limestone GRAVEL. Sand is fine to coarse. Geotextile membrane at base. |
| | | | | | 13.76 | 0.40 | | |
| | | | | | | (1.10) | | MADE GROUND: Grey slightly sandy SILT. Sand is fine to medium. Rare angular to sub-rounded fine to medium brick and quartzite gravel. |
| | | 1.20 - 1.30 | ES 1 | | | | | |
| | | | | | 12.66 | 1.50 | | |
| | | | | | | (0.40) | | Light brown slightly sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | | | | 12.26 | 1.90 | | |
| | | | | | | (0.50) | | Light brown slightly clayey sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | 11.76 | 2.40 | | |
| | | 2.70 - 2.90 | B 1 | | | (0.50) | | Light greyish brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | 11.26 | 2.90 | | *End of Trial Pit at 2.90m* |

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Trial Pit remained dry upon completion. 5.Trial Pit remained stable upon completion. 6.Trial pit converted into a BRE365 infiltration test (SA101), gravel between 2.00 m bgl and 2.90 m bgl.

**Method, Plant, Stability, Dimensions**
0.00 - 2.90m TP JCB 3CX
*L = 1.70m*
*W = 0.60m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Trial Pit

**TP104**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 445787.53 | 117795.96 | 12.81 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 | ES 1 | | | (0.30) | | Grass over dark brown slightly gravelly sandy SILT. Gravel is angular to sub-angular fine to coarse quartzite. Sand is fine to coarse. |
| | | | | | 12.51 | 0.30 | | Light brown slightly sandy SILT. Rare angular to sub-angular fine to coarse quartzite gravel. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 0.60 - 0.80 | B 1 | | | (0.70) | | |
| | | 1.00 - 1.40 | B 2 | | 11.81 | 1.00 | | Brown slightly clayey sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.60) | | |
| | | 2.00 - 2.20 | B 3 | | 11.21 | 1.60 | | Light greyish brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.80) | | |
| | | | | | 10.41 | 2.40 | | *End of Trial Pit at 2.40m* |

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Trial Pit remained dry upon completion. 5.Trial Pit remained stable upon completion. 6.Trial pit converted into a BRE365 infiltration test (SA102), gravel between 1.60 m bgl and 2.40 m bgl.

**Method, Plant, Stability, Dimensions**
**0.00 - 2.40m** TP JCB 3CX
*L = 1.60m*
*W = 0.60m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Trial Pit

**TP105**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 445857.22 | 117764.12 | 13.16 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

| Client | Contractor | Consultant |
|---|---|---|
| Blocwork (Eastleigh) Ltd and AGS Airports Group Limited | FW Pammenter & Son | MOK/JCR |

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.20) | | Grass over brown slightly sandy SILT. Sand is fine to medium. |
| | | | | | 12.96 | 0.20 | | Light brown slightly sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | 0.50 - 0.80 | B 1 | | | (1.00) | | |
| | | | | | 11.96 | 1.20 | | Brown slightly clayey sandy angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.40) | | |
| | | 1.60 - 1.80 | B 2 | | 11.56 | 1.60 | | Greyish brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (1.45) | | |
| | | 2.80 - 2.90 | B 3 | | | | | |
| | ▽ | | | | 10.11 | 3.05 | | Light brownish grey clayey SILT. [RIVER TERRACE DEPOSITS] |
| | | 3.10 | PID | 0.40 | | (0.15) | | |
| | | 3.10 - 3.20 | ES 1 | | 9.96 | 3.20 | | *End of Trial Pit at 3.20m* |

**Remarks**

1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. Slight hydrocarbon odour noted in groundwater and slight sheen on water surface. 4. Groundwater identified at 3.00 m bgl. 5. Trial Pit terminated at 3.20 m bgl due to collapsing sides following groundwater ingress.

**Method, Plant, Stability, Dimensions**

**0.00 - 3.20m** TP JCB 3CX

*L = 1.90m*

*W = 0.60m*

**Logger**

MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Trial Pit

**TP106**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 445883.13 | 117750.38 | 12.78 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

| Client | Contractor | Consultant |
|---|---|---|
| Blocwork (Eastleigh) Ltd and AGS Airports Group Limited | FW Pammenter & Son | MOK/JCR |

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.20) | | Grass over dark brown slightly gravelly sandy SILT. Gravel is angular to sub-angular fine to coarse quartzite. Sand is fine to coarse. |
| | | | | | 12.58 | 0.20 | | Light brownish grey clayey sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | 0.50 - 0.70 | B 1 | | | (1.30) | | |
| | | | | | 11.28 | 1.50 | | Light brown slightly gravelly sandy SILT. Gravel is angular to sub-rounded fine to medium quartzite. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.20) | | |
| | | | | | 11.08 | 1.70 | | Light brown slightly clayey sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.30) | | |
| | | 2.10 - 2.20 | B 2 | | 10.78 | 2.00 | | Orangish brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (1.20) | | |
| | ▽ | | | | 9.58 | 3.20 | | *End of Trial Pit at 3.20m* |

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

**Remarks**

1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Groundwater identified at 3.10 m bgl. 5. Trial Pit terminated at 3.20 m bgl due to collapsing sides following groundwater ingress.

**Method, Plant, Stability, Dimensions**

**0.00 - 3.20m** TP JCB 3CX

*L = 1.70m*

*W = 0.60m*

**Logger**

MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

# Trial Pit

**TP107**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 445904.49 | 117739.23 | 12.66 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.10 - 0.20 | ES 1 | | | (0.20) | | Grass over dark brown slightly gravelly sandy SILT. Gravel is angular to sub-angular fine to coarse quartzite. Sand is fine to coarse. |
| | | | | | 12.46 | 0.20 | | Light brown slightly sandy SILT. Rare angular to sub-angular fine to coarse quartzite gravel. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 0.60 - 0.80 | B 1 | | | (0.60) | | |
| | | | | | 11.86 | 0.80 | | Brown slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse quartzite. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.40) | | |
| | | | | | 11.46 | 1.20 | | Light greyish brown sandy angular to sub-rounded fine to medium quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 1.60 - 1.80 | B 2 | | | (1.70) | | |
| | ▽ | | | | 9.76 | 2.90 | | *End of Trial Pit at 2.90m* |

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. Slight hydrocarbon odour noted in groundwater and slight sheen on water surface. 4. Groundwater identified at 2.90 m bgl. 5. Trial Pit terminated at 2.90 m bgl due to collapsing sides following groundwater ingress.

**Method, Plant, Stability, Dimensions**
**0.00 - 2.90m** TP JCB 3CX
*L = 1.80m*
*W = 0.60m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

# Trial Pit

**TP108**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 446043.47 | 117695.97 | 12.40 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.20) | | Grass over brown slightly sandy SILT. Sand is fine to medium. |
| | | | | | 12.20 | 0.20 | | Brown sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | 0.30 - 0.40 | ES 1 | | | (0.60) | | |
| | | 0.80 - 1.20 | B 1 | | 11.60 | 0.80 | | Brown slightly clayey sandy angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.40) | | |
| | | | | | 11.20 | 1.20 | | *End of Trial Pit at 1.20m* |

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Trial Pit remained dry upon completion. 5.Trial Pit remained stable upon completion. 6.Trial pit converted into a BRE365 infiltration test (SA103), gravel between 0.80 m bgl and 1.20 m bgl.

**Method, Plant, Stability, Dimensions**
**0.00 - 1.20m** TP JCB 3CX
*L = 1.80m*
*W = 0.60m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Trial Pit

**TP109**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 446328.16 | 117562.61 | 10.83 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.30) | | Grass over dark brown slightly gravelly sandy SILT. Gravel is angular to sub-angular fine to coarse quartzite. Sand is fine to coarse. |
| | | | | | 10.53 | 0.30 | | Light brown slightly sandy SILT. Rare angular to sub-angular fine to coarse quartzite gravel. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (1.00) | | |
| | | | | | 9.53 | 1.30 | | Light brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.40) | | |
| | | 1.70 - 1.90 | B 1 | | 9.13 | 1.70 | | Greenish grey fine to medium SAND. [WITTERING FORMATION] |
| | | | | | | (0.70) | | |
| | ▽ | | | | 8.43 | 2.40 | | |
| | | | | | | (0.10) | | Bluish grey clayey fine to medium SAND. [WITTERING FORMATION] |
| | | | | | 8.33 | 2.50 | | Bluish grey fine to medium SAND. [WITTERING FORMATION] |
| | | | | | | (1.00) | | |
| | | 3.30 - 3.40 | B 2 | | 7.33 | 3.50 | | *End of Trial Pit at 3.50m* |

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Groundwater seepage noted at 2.40 m bgl. 5. Trial Pit remained stable upon completion.

**Method, Plant, Stability, Dimensions**
0.00 - 3.50m TP JCB 3CX
*L = 1.90m*
*W = 0.60m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Trial Pit

**TP110**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 446027.69 | 117619.96 | 12.02 | 1:25 |

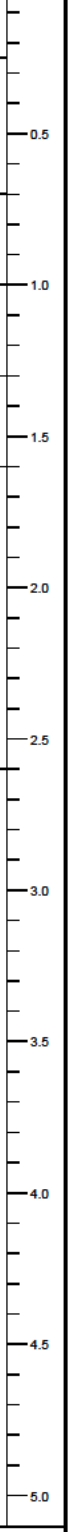
| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.25) | | Grass over brown slightly sandy SILT. Sand is fine to medium. |
| | | | | | 11.77 | 0.25 | | Light brown slightly sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.45) | | |
| | | | | | 11.32 | 0.70 | | Brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse quartzite. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.30) | | |
| | | | | | 11.02 | 1.00 | | Light greyish brown clayey sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.30) | | |
| | | | | | 10.72 | 1.30 | | Light greyish brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.30) | | |
| | | | | | 10.42 | 1.60 | | Light greyish brown sandy angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 1.80 - 1.90 | B 1 | | | | | |
| | | | | | | (1.00) | | |
| | ▽ | | | | 9.42 | 2.60 | | *End of Trial Pit at 2.60m* |




**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Trial Pit terminated at 2.60 m bgl due to collapsing sides following water ingress at 2.60 m bgl.

**Method, Plant, Stability, Dimensions**
**0.00 - 2.60m** TP JCB 3CX
*L = 1.70m*
*W = 0.60m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Trial Pit

**TP111**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 445668.19 | 117339.20 | 10.35 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.20) | | MADE GROUND: Grass over dark brown slightly gravelly sandy SILT. Gravel is angular to sub-angular fine to coarse quartzite. Sand is fine to coarse. |
| | | | | | 10.15 | 0.20 | | MADE GROUND: Light brown slightly clayey sandy angular to sub-angular fine to coarse quartzite and brick GRAVEL. Sand is fine to coarse. |
| | | 0.50 - 0.60 | ES 1 | | | (0.50) | | |
| | | | | | 9.65 | 0.70 | | Orangish brown mottled light grey sandy angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. Rare angular quartzite cobbles. [RIVER TERRACE DEPOSITS] |
| | | | | | | (1.10) | | |
| | | 1.80 - 2.90 | B 1 | | 8.55 | 1.80 | | Dark grey slightly gravelly sandy CLAY. Gravel is angular to sub-rounded fine to coarse quartzite. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.50) | | |
| | | 2.30 - 2.40 | B 2 | | 8.05 | 2.30 | | Greenish grey very sandy SILT. Sand is fine to medium. [WITTERING FORMATION] |
| | | | | | | (1.20) | | |
| | | 3.50 - 3.60 | B 3 | | 6.85 | 3.50 | | Bluish grey fine to medium SAND. [WITTERING FORMATION] |
| | ▽ | | | | | (0.10) | | |
| | | | | | 6.75 | 3.60 | | *End of Trial Pit at 3.60m* |

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Groundwater identified at 3.60 m bgl. 5. Trial Pit remained stable upon completion.

**Method, Plant, Stability, Dimensions**
0.00 - 3.60m TP JCB 3CX
*L = 1.90m*
*W = 0.60m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Trial Pit

**TP112**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| TP | 445706.57 | 117511.11 | 11.97 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

| Client | Contractor | Consultant |
|---|---|---|
| Blocwork (Eastleigh) Ltd and AGS Airports Group Limited | FW Pammenter & Son | MOK/JCR |

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.30) | | Grass over brown slightly sandy SILT. Sand is fine to medium. |
| | | 0.20 - 0.30 | ES 1 | | 11.67 | 0.30 | | Light brown slightly sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.40) | | |
| | | | | | 11.27 | 0.70 | | Light brown gravelly sandy SILT. Gravel is angular to sub-angular fine to coarse quartzite. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.20) | | |
| | | 0.90 - 1.10 | B 1 | | 11.07 | 0.90 | | Brown slightly clayey sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.70) | | |
| | | | | | 10.37 | 1.60 | | Light greyish brown sandy angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | | | | | (1.20) | | |
| | | 2.80 - 2.90 | D 1 | | 9.17 | 2.80 | | |
| | | | | | | (0.10) | | Light grey slightly sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | | | | 9.07 | 2.90 | | *End of Trial Pit at 2.90m* |

**Remarks**

1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Trial Pit terminated at 2.90 m bgl due to collapsing sides following water ingress at 2.70 m bgl.

**Method, Plant, Stability, Dimensions**

**0.00 - 2.90m** TP JCB 3CX

*L = 1.80m*

*W = 0.60m*

**Logger**

MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Cable Percussion Log

**CP101**
Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| CP | 445412.60 | 117940.70 | 14.30 | 1:50 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-03 | 2025-02-03 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
SE Drilling Ltd

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Type/ Ref | Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 0.30 | B | | | (0.30) | | MADE GROUND: Greyish brown sandy angular to sub-angular fine to coarse limestone GRAVEL. Sand is fine to coarse. Geotextile membrane at base. |
| | | | | | 14.00 | 0.30 | | MADE GROUND: Dark greyish brown slightly sandy SILT with rare angular to sub-angular fine to medium gravel of concrete, quartzite and brick. Sand is fine to coarse. |
| | | 0.50 - 0.60 | ES 1 | | | | | |
| | | 0.50 - 1.00 | B | | | (1.00) | | |
| | | 1.20 | SPT | N=6 (1,1/1,1,2,2) | | | | |
| | | 1.20 - 1.65 | D | | 13.00 | 1.30 | | Brown slightly clayey sandy SILT. Sand is fine to medium. Rare angular to sub-angular fine to medium quartzite gravel. [RIVER TERRACE DEPOSITS] |
| | | 1.50 - 2.00 | B | | | (0.40) | | |
| | | | | | 12.60 | 1.70 | | Brown slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse quartzite. [RIVER TERRACE DEPOSITS] |
| | | 2.00 | SPT | N=10 (1,2/2,2,3,3) | | (0.30) | | |
| | | 2.00 - 2.45 | D | | 12.30 | 2.00 | | Medium dense light brown sandy angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 2.00 - 2.50 | B | | | | | |
| | | 3.00 | SPT(C) | N=16 (4,4/4,4,4,4) | | | | |
| | | 3.00 - 3.45 | D | | | | | |
| | | 3.00 - 3.50 | B | | | (2.70) | | |
| | | 4.00 | SPT(C) | N=10 (3,4/3,2,2,3) | | | | |
| | | 4.00 - 4.45 | D | | | | | |
| | | 4.00 - 4.50 | B | | | | | |
| | | | | | 9.60 | 4.70 | | Grey slightly clayey sandy SILT. Sand is fine to medium. [LONDON CLAY FORMATION] |
| | | 5.00 | D | | | | | |
| | | 5.50 - 5.95 | U | Blows: 70, Recovery: 60% | | | | |
| | | 6.00 | D | | | | | |
| | | 6.50 - 7.00 | B | | | (3.80) | | |
| | | 7.00 | SPT | N=35 (2,2/5,10,10,10) | | | | |
| | | 7.00 - 7.45 | D | | | | | |
| | | 8.00 | D | | | | | |
| | | 8.50 - 8.95 | U | Blows: 100, Recovery: 0% | 5.80 | 8.50 | | Grey slightly sandy clayey SILT. Sand is fine to medium. [LONDON CLAY FORMATION] |
| | | 8.50 - 9.00 | B | | | | | |
| | | | | | | (1.50) | | |
| | | 10.00 | SPT | N=52 (2,3/7,11,11,23) | 4.30 | 10.00 | | *End of Borehole at 10.00m* |
| | | 10.00 | D | | | | | |

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. SPT Hammer Ref. SEDS7, Energy Ratio 74 %. 5. Borehole terminated at 10.00 m bgl at target depth. 6. Borehole installed with a 50 mm HDPE standpipe, gas bung and raised cover to 6.00 m bgl.

**Method, Plant, Stability, Dimensions**
**0.00 - 10.00m** CP Dando 2000

**Logger**
CS/MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

# Cable Percussion Log

**CP102**
Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| CP | 445493.45 | 117992.43 | 13.93 | 1:50 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-03 | 2025-02-03 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
SE Drilling Ltd

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Type/ Ref | Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.30) | | MADE GROUND: Greyish brown sandy angular to sub-angular fine to coarse limestone GRAVEL. Sand is fine to coarse. Geotextile membrane at base. |
| | | 0.40 - 0.90 | B | | 13.63 | 0.30 | | MADE GROUND: Greyish brown slightly sandy SILT with rare angular to sub-angular fine to coarse gravel of quartzite and mudstone. Sand is fine to medium. |
| | | | | | | (1.00) | | |
| | | 1.20 - 1.65 | U | Blows: 100, Recovery: 70% | | | | |
| | | 1.30 | D | | 12.63 | 1.30 | | |
| | | | | | | (0.20) | | Light brown slightly clayey sandy SILT. Sand is fine to medium. Rare angular to sub-angular fine to medium quartzite gravel. [RIVER TERRACE DEPOSITS] |
| | | | | | 12.43 | 1.50 | | Dense light orangish brown sandy angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 1.70 | D | | | | | |
| | | 2.00 | SPT(C) | N=50 for 200mm (5,7/13,15,23 for 50mm) | | | | |
| | | 2.00 - 2.45 | D | | | | | |
| | | 2.00 - 3.45 | B | | | | | |
| | | 3.00 | SPT(C) | N=40 (5,6/7,10,10,13) | | | | |
| | | 3.00 - 3.50 | D | | | (3.30) | | |
| | | 3.00 - 4.45 | B | | | | | |
| | | 4.00 | SPT | N=45 (5,7/13,13,9,10) | | | | |
| | | 4.00 | B | | | | | |
| | ▽ | 4.00 - 4.50 | D | | | | | |
| | | | | | 9.13 | 4.80 | | Light grey sandy SILT. Sand is fine to medium. [LONDON CLAY FORMATION] |
| | | 5.00 | D | | | | | |
| | | 5.00 - 5.50 | B | | | | | |
| | | 5.50 | SPT | N=15 (1,2/3,3,4,5) | | | | |
| | | 5.50 - 5.95 | D | | | | | |
| | | 7.00 | D | | | | | |
| | | 7.00 - 7.30 | U | Blows: 100, Recovery: 80% | | | | |
| | | 7.35 | D | | | (5.20) | | |
| | | 8.00 | D | | | | | |
| | | 8.50 | SPT | N=28 (2,4/5,7,9,7) | | | | |
| | | 8.50 - 8.95 | D | | | | | |
| | | 9.00 | D | | | | | |
| | | 10.00 | D | | 3.93 | 10.00 | | *End of Borehole at 10.00m* |
| | | 10.00 - 10.45 | U | Blows: 100, Recovery: 0% | | | | |

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. SPT Hammer Ref. SEDS7, Energy Ratio 74 %. 5. Borehole terminated at 10.00 m bgl at target depth. 6. Borehole installed with a 50 mm HDPE standpipe, gas bung and raised cover to 6.00 m bgl.

**Method, Plant, Stability, Dimensions**
**0.00 - 10.00m** CP Dando 2000

**Logger**
CS/MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Cable Percussion Log

**CP103**
Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| CP | 445838.76 | 117773.64 | 12.86 | 1:50 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
SE Drilling Ltd

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Type/ Ref | Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 0.30 | B | | | (0.30) | | Grass over brown slightly sandy SILT with rare angular to sub-angular fine to medium quartzite gravel. Sand is fine to medium |
| | | 0.30 - 0.80 | B | | 12.56 | 0.30 | | Brown lightly sandy SILT with rare angular to sub-angular fine to medium quartzite gravel. Sand is fine to medium [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.70) | | |
| | | | | | 11.86 | 1.00 | | Light brown slightly gravelly sandy SILT. Gravel is angular fine to coarse quartzite. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 1.20 | SPT | N=50 for 235mm (1,2/2,3,3,4 for 10mm) | | (0.50) | | |
| | | 1.20 - 1.65 | D | | | | | |
| | | 1.20 - 1.70 | B | | 11.36 | 1.50 | | Medium dense sandy angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. Slight hydrocarbon odour within wet arisings. [RIVER TERRACE DEPOSITS] |
| | | 2.00 | SPT(C) | N=50 (5,10/13,14,18,5) | | | | |
| | | 2.00 - 2.45 | D | | | | | |
| | | 2.00 - 2.50 | B | | | (1.90) | | |
| | | 3.00 | SPT(C) | N=24 (5,7/7,8,6,3) | | | | |
| | | 3.00 - 3.45 | D | | | | | |
| | | 3.00 - 3.50 | B | | | | | |
| | | 3.20 | PID | 1.90 | 9.46 | 3.40 | | Greyish brown slightly clayey sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. Slight hydrocarbon odour within wet arisings. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.80) | | |
| | | 4.00 | SPT | N=10 (3,4/3,2,2,3) | | | | |
| | | 4.00 - 4.45 | D | | | | | |
| | | 4.20 | PID | 0.00 | 8.66 | 4.20 | | Dark grey friable clayey SILT with fine sand laminations. [LONDON CLAY FORMATION] |
| | | 4.20 - 4.70 | B | | | | | |
| | | 5.00 | D | | | | | |
| | | 5.50 - 5.95 | U | Blows: 100, Recovery: 80% | | | | |
| | | 6.00 | D | | | | | |
| | | 7.00 | SPT | N=19 (2,2/3,4,5,7) | | (5.80) | | |
| | | 7.00 - 0.16 | D | | | | | |
| | | 7.00 | D | | | | | |
| | | 8.00 | D | | | | | |
| | | 8.50 | SPT | N=22 (2,3/4,5,6,7) | | | | |
| | | 8.50 - 8.95 | D | | | | | |
| | | 9.00 | D | | | | | |
| | | 10.00 | SPT | N=29 (3,3/4,6,7,12) | 2.86 | 10.00 | | *End of Borehole at 10.00m* |
| | | 10.00 | D | | | | | |

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. Slight hydrcarbon odour noted within wet arisings at water table. 4. SPT Hammer Ref. SEDS7, Energy Ratio 74 %. 5. Borehole terminated at 10.00 m bgl at target depth. 6. Borehole installed with a 50 mm HDPE standpipe, gas bung and raised cover to 4.00 m bgl.

**Method, Plant, Stability, Dimensions**
**0.00 - 10.00m** CP Dando 2000

**Logger**
CS/MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Cable Percussion Log

**CP104**
Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| CP | 445986.46 | 117712.65 | 12.63 | 1:50 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
SE Drilling Ltd

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Type/ Ref | Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | 12.43 | (0.20) 0.20 | | Grass over brown slightly sandy SILT with rare angular to sub-angular fine to medium quartzite gravel. Sand is fine to medium |
| | | 0.50 - 1.00 | B | | | | | Brown lightly sandy SILT with rare angular to sub-angular fine to medium quartzite gravel. Sand is fine to medium [RIVER TERRACE DEPOSITS] |
| | | | | | | (1.20) | | |
| | | 1.20 - 1.65 | U | Blows: 50, Recovery: 50% | | | | |
| | | 1.40 - 1.90 | B | | 11.23 | 1.40 | | |
| | | | | | | (0.30) | | Light brown slightly gravelly sandy SILT. Gravel is angular fine to coarse quartzite. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 1.70 | D | | 10.93 | 1.70 | | |
| | | 2.00 | SPT(C) | N=39 (3,4/9,9,10,11) | | | | Dense to medium dense orangish brown sandy angular to sub-angular fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS] |
| | | 2.00 - 2.45 | D | | | | | |
| | | 2.00 - 2.60 | B | | | | | |
| | | 3.00 | SPT(C) | N=29 (3,4/6,7,7,9) | | | | |
| | | 3.00 - 3.45 | D | | | | | |
| | | 3.00 - 4.45 | B | | | | | |
| | | | | | | (3.70) | | |
| | ▽ | 4.00 | SPT(C) | N=26 (2,4/6,7,7,6) | | | | |
| | | 4.00 - 4.50 | D | | | | | |
| | | 4.00 - 5.95 | B | | | | | |
| | | 5.50 | U | Blows: 40, Recovery: 30% | 7.23 | 5.40 | | Dark grey friable clayey SILT with fine sand laminations. [LONDON CLAY FORMATION] |
| | | 6.00 - 7.00 | D | | | | | |
| | | 6.50 | B | | | | | |
| | | | | | | (2.60) | | |
| | | 7.00 - 7.95 | D | | | | | |
| | | 7.50 | SPT | N=16 (1,2/2,3,5,6) | | | | |
| | | 7.50 | D | | | | | |
| | ▽ | 8.00 - 8.95 | D | | 4.63 | 8.00 | | Dark grey friable clayey sandy SILT. Sand is fine to medium. [LONDON CLAY FORMATION] |
| | | 8.50 | SPT | N=22 (2,2/4,5,6,7) | | | | |
| | | 8.50 | D | | | | | |
| | | 9.00 | D | | | (2.00) | | |
| | | 10.00 | SPT | N=25 (2,3/4,5,7,9) | 2.63 | 10.00 | | *End of Borehole at 10.00m* |
| | | 10.00 | D | | | | | |

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. SPT Hammer Ref. SEDS7, Energy Ratio 74 %. 5. Borehole terminated at 10.00 m bgl at target depth. 6. Borehole installed with a 50 mm HDPE standpipe, gas bung and raised cover to 5.50 m bgl.

**Method, Plant, Stability, Dimensions**
**0.00 - 10.00m** CP Dando 2000

**Logger**
CS/MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Hand Pit

**HP101**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| HP | 445536.93 | 117988.29 | 14.31 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.30) | | MADE GROUND: Grass over light brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse quartzite. |
| | | | | | 14.01 | 0.30 | | MADE GROUND: Dark greyish brown slightly gravelly sandy SILT. Sand is fine to carose. Gravel is angular to sub-angular fine to coarse brick, quartzite, wood and rare glass. |
| | | 0.50 - 0.60 | ES 1 | | | (0.90) | | |
| | | | | | 13.11 | 1.20 | | *End of Trial Pit at 1.20m* |

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Backfilled with arisings.

**Method, Plant, Stability, Dimensions**
**0.00 - 1.20m** HP
*L = 0.30m*
*W = 0.40m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

# Hand Pit

**HP102**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| HP | 445574.15 | 117984.30 | 14.53 | 1:25 |

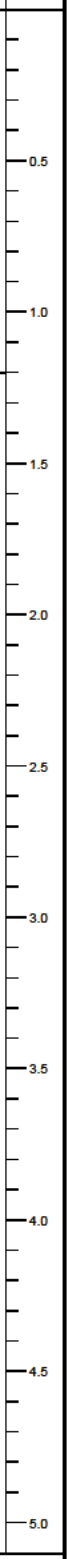
| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.20 - 0.30 | ES 1 | | | (1.20) | | MADE GROUND: Grass over dark brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse brick, quartzite, wood, metal and concrete. |
| | | 0.50 - 1.00 | B 1 | | | | | |
| | | | | | 13.33 | 1.20 | | *End of Trial Pit at 1.20m* |




**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Backfilled with arisings.

**Method, Plant, Stability, Dimensions**
**0.00 - 1.20m** HP Hand Tools
*L = 0.40m*
*W = 0.30m*

**Logger**
MOK

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Hand Pit

**HP103**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| HP | 445670.01 | 117920.17 | 13.74 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

| Client | Contractor | Consultant |
|---|---|---|
| Blocwork (Eastleigh) Ltd and AGS Airports Group Limited | FW Pammenter & Son | MOK/JCR |

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.30 - 0.35 | ES 1 | | | (0.40) | | MADE GROUND: Dark brown to black clayey gravelly fine to coarse SAND. Gravel is angular to sub-rounded fine to coarse wood, quartzite and plastic. Ash and fibrous peat present. |
| | | | | | 13.34 | 0.40 | | Greyish brown slightly sandy SILT with rare angular fine to medium quartzite gravel. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | | | | | (0.80) | | |
| | | | | | 12.54 | 1.20 | | *End of Trial Pit at 1.20m* |

**Remarks**

1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Backfilled with arisings.

**Method, Plant, Stability, Dimensions**

**0.00 - 1.20m** HP Hand Tools

*L = 0.30m*

*W = 0.40m*

**Logger**

JCR

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Hand Pit

# HP104

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| HP | 445700.17 | 117900.96 | 14.20 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-04 | 2025-02-04 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.50 - 0.55 | ES 1 | | | (1.20) | | MADE GROUND: Dark brown to black clayey gravelly fine to coarse SAND. Gravel is angular to sub-rounded fine to coarse quartzite, wood, plastic, flint, metal and rare textile. Ash present. |
| | | | | | 13.00 | 1.20 | | *End of Trial Pit at 1.20m* |

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Backfilled with arisings.

**Method, Plant, Stability, Dimensions**
**0.00 - 1.20m** HP Hand Tools
*L = 0.40m*
*W = 0.40m*

**Logger**
JCR

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Hand Pit

**HP105**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| HP | 446198.72 | 117747.72 | 12.85 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.40 - 0.60 | B 1 | | | (1.10) | | MADE GROUND: Black gravelly fine to coarse ash SAND with low cobble content. Gravel is angular fine to coarse brick, concrete, slate and rare metal. Cobbles are angular whole bricks and concrete. |
| | | 0.70 - 0.75 | ES 1 | | | | | |
| | | 1.10 - 1.15 | ES 2 | | 11.75 | 1.10 | | |
| | | | | | 11.65 | (0.10) 1.20 | | Orangish brown slightly clayey sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS] |
| | | | | | | | | *End of Trial Pit at 1.20m* |

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Backfilled with arisings.

**Method, Plant, Stability, Dimensions**
**0.00 - 1.20m** HP Hand Tools
*L = 0.40m*
*W = 0.40m*

**Logger**
JCR

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Hand Pit

**HP106**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| HP | 446233.50 | 117723.27 | 12.18 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.20) | | Grass over brown slightly sandy clayey SILT with rare angular to sub-rounded fine to medium quartzite gravel. Sand is fine to medium. |
| | | | | | 11.98 | 0.20 | | Orangish brown slightly clayey sandy SILT. Sand is fine to medium [RIVER TERRACE DEPOSITS] |
| | | 0.30 - 0.50 | B 1 | | | | | |
| | | 0.50 - 0.55 | ES 1 | | | | | |
| | | | | | | (1.00) | | |
| | | | | | 10.98 | 1.20 | | *End of Trial Pit at 1.20m* |

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Backfilled with arisings.

**Method, Plant, Stability, Dimensions**
**0.00 - 1.20m** HP Hand Tools
*L = 0.35m*
*W = 0.35m*

**Logger**
JCR

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Hand Pit

**HP107**

Sheet 1 of 1

| Hole Type | Easting | Northing | Ground Level (m) | Scale |
|---|---|---|---|---|
| HP | 446224.71 | 117772.66 | 12.30 | 1:25 |

| Project Name | Project No. | Start Date | End Date |
|---|---|---|---|
| Navigator Quarter, Southampton | 4362 | 2025-02-05 | 2025-02-05 |

**Client**
Blocwork (Eastleigh) Ltd and AGS Airports Group Limited

**Contractor**
FW Pammenter & Son

**Consultant**
MOK/JCR

| Inst/ Backfill | Water Levels | Samples and Tests: Depth (m) | Samples and Tests: Type/ Ref | Samples and Tests: Results | Level (m) | Depth (thickness) (m) | Strata: Legend | Strata: Description |
|---|---|---|---|---|---|---|---|---|
| | | 0.10 - 0.15 | ES 1 | | 12.15 | (0.15) 0.15 | | Grass over brown slightly sandy clayey SILT with rare angular to sub-rounded fine to medium quartzite gravel. Sand is fine to medium. |
| | | 0.80 - 1.00 | B 1 | | | (1.05) | | Orangish brown slightly clayey sandy SILT. Sand is fine to medium [RIVER TERRACE DEPOSITS] |
| | | | | | 11.10 | 1.20 | | *End of Trial Pit at 1.20m* |

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

**Remarks**
1. Logged in general accordance with BS 5930:2015+A1:2020. 2. Area spot cleared for services prior to excavation by a specialist third-party contractor. 3. No olfactory or visual evidence of contamination noted. 4. Backfilled with arisings.

**Method, Plant, Stability, Dimensions**
**0.00 - 1.20m** HP Hand Tools
*L = 0.40m*
*W = 0.35m*

**Logger**
JCR

**Checked By:** JCR **Approved By:** TH **Status:** FINAL

Created using Pebble Geo

# Appendix C – Monitoring and BRE365 Test Data

| Site Name | Southampton | Job number | 4362 |
|---|---|---|---|
| Client | Blocwork (Eastleigh) LLP and AGS Airports Group Limited | Recorded by | MOK & JR |
| Date (DD/MM/YYYY) | 25/02/2025 | | |
| Gas Analyser | G501799 | Visit Number | 1 |

| Readings at start | $CH_4$ (% v/v) | <0.1 | $CO_2$ (% v/v) | <0.1 | $O_2$ (% v/v) | 20.6 | $H_2S$ (ppm) | <1 | |
|---|---|---|---|---|---|---|---|---|---|
| General comments | | | | | | | | | |

| WEATHER | Start | End |
|---|---|---|
| Time | 12 | |
| Weather (dry/rain/snow/ice) | Dry | Dry |
| Pressure (mb) | 1012.0 | 1012.0 |
| Rising/Falling Trend | Falling | |
| Wind Speed (m/s) | 8.00 | 5.40 |
| Wind Dir. (From) | SE | SE |
| Temperature °c | 9.00 | 11.00 |
| SWL Measured from | Ground Level | |

| Ref | GROUND GAS | | | | | | | | | | | | | GROUNDWATER | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow | | $CH_4$ | | $CO_2$ | | $O_2$ | | $H_2S$ | CO | VOC | Differential (Relative) Pressure | Atmos. Pressure | Depth to free product | Depth to water | Depth to base | (e.g. water colour, sheen, odour, damage to well or gas tap, flooded ground etc.)<br>$ For **Depth to water** state<br>**Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)**<br># **For Depth to Product state**<br>**ND (= Not detected - product looked for but absent) or NR (= Not Recorded - instrument used unable to detect product)** |
| | l/hr | | % v/v | | % v/v | | % v/v | | ppm | | | | | | | | |
| | Max | Steady | Max | Steady | Max | Steady | Min | Steady | Max | Max | Max | mb | mb | m | m | m | |
| | The formulae require that only numbers, "<0.1" for ground gas and flow or "DRY" for groundwater are entered in the sheet | | | | | | | | | | | | | | | | |
| CP101 | <0.1 | <0.1 | <0.1 | <0.1 | 6.0 | 6.0 | 8.4 | 8.4 | <1 | <1 | 0.3 | -0.6 | 1012 | ND | 4.59 | 5.35 | 15 mins steady flow before GW sample. GW light brown with no odour and no sheen. |
| CP102 | 0.2 | 0.2 | <0.1 | <0.1 | 5.5 | 5.5 | 6.3 | 6.3 | <1 | <1 | 0.2 | 0.4 | 1012.0 | ND | 4.17 | 4.91 | 15 mins steady flow before GW sample. GW light brown with no odour and no sheen. |
| CP103 | 0.3 | 0.3 | <0.1 | <0.1 | 2.3 | 2.3 | 7.9 | 7.9 | <1 | <1 | 1.3 | 22.9 | 1013 | ND | 2.96 | 4.15 | 15 mins steady flow before GW sample. GW light greyish brown with slight hydrocarbon odour and sheen. |
| CP104 | <0.1 | <0.1 | <0.1 | <0.1 | 6.1 | 6.1 | 3.3 | 3.3 | <1 | <1 | 0.4 | 24.8 | 1013.0 | ND | 3.02 | 5.79 | 15 mins steady flow before GW sample. GW light grey with moderate hydrocarbon odour and no sheen. |

| Site Name | Southampton | Job number | 4362 |
|---|---|---|---|
| Client | Blocwork (Eastleigh) LLP and AGS Airports Group Limited | Recorded by | Enitial |
| Date (DD/MM/YYYY) | 31/03/2025 | | |
| Gas Analyser | G505505 | Visit Number | 2 |

| Readings at start | $CH_4$ (% v/v) | <0.1 | $CO_2$ (% v/v) | 0.1 | $O_2$ (% v/v) | 20.9 | $H_2S$ (ppm) | <1.0 | |
|---|---|---|---|---|---|---|---|---|---|
| General comments | | | | | | | | | |

| WEATHER | Start | End |
|---|---|---|
| Time | 11:06 | 13:29 |
| Weather (dry/rain/snow/ice) | Dry | Dry |
| Pressure (mb) | 1029.0 | 1029.0 |
| Rising/Falling Trend | Rising | |
| Wind Speed (m/s) | 2.00 | 2.00 |
| Wind Dir. (From) | SE | SE |
| Temperature °C | 15.00 | 16.00 |
| SWL Measured from | Top of Cover | |

| Ref | GROUND GAS | | | | | | | | | | | | | GROUNDWATER | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow | | $CH_4$ | | $CO_2$ | | $O_2$ | | $H_2S$ | CO | VOC | Differential (Relative) Pressure | Atmos. Pressure | Depth to free product | Depth to water | Depth to base | (e.g. water colour, sheen, odour, damage to well or gas tap, flooded ground etc.)<br>$ For **Depth to water** state<br>**Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)**<br># **For Depth to Product state**<br>**ND (= Not detected - product looked for but absent) or NR (= Not Recorded - instrument used unable to detect product)** |
| | l/hr | | % v/v | | % v/v | | % v/v | | ppm | | | mb | mb | m | m | m | |
| | Max | Steady | Max | Steady | Max | Steady | Min | Steady | Max | Max | Max | | | | | | |
| | The formulae require that only numbers, "<0.1" for ground gas and flow or "DRY" for groundwater are entered in the sheet | | | | | | | | | | | | | | | | |
| CP101 | <0.1 | <0.1 | <0.1 | <0.1 | 1.1 | 1.1 | 16.5 | 16.5 | 1.0 | 10.0 | 0.8 | 0.1 | 1029 | ND | 5.22 | 5.72 | |
| CP102 | 1.0 | 0.1 | <0.1 | <0.1 | 6.6 | 6.6 | 6.1 | 6.1 | 1.0 | 9.0 | 7.6 | 0.3 | 1029 | ND | 4.88 | 5.30 | |
| CP103 | <0.1 | <0.1 | <0.1 | <0.1 | 4.8 | 4.8 | 11.3 | 11.3 | <1 | 9.0 | 0.1 | 0.1 | 1029 | ND | 3.70 | 4.55 | |
| CP104 | <0.1 | <0.1 | <0.1 | <0.1 | 5.9 | 5.9 | 5.2 | 5.2 | <1 | 9.0 | 0.1 | 0.1 | 1029 | ND | 3.60 | 6.05 | |

| Version | 1.2 | Issue Date | 18/06/2024 |
|---|---|---|---|

| Site Name | Southampton | Job number | 4362 |
|---|---|---|---|
| Client | Blocwork (Eastleigh) LLP and AGS Airports Group Limited | Recorded by | Enitial |
| Date (DD/MM/YYYY) | 28/04/2025 | | |
| Gas Analyser | G505505 | Visit Number | 3 |

| Readings at start | $CH_4$ (% v/v) | <0.1 | $CO_2$ (% v/v) | 0.1 | $O_2$ (% v/v) | 20.9 | $H_2S$ (ppm) | <1.0 | |
|---|---|---|---|---|---|---|---|---|---|
| General comments | | | | | | | | | |

| WEATHER | Start | End |
|---|---|---|
| Time | 12:37 | 14:15 |
| Weather (dry/rain/snow/ice) | Dry | Dry |
| Pressure (mb) | 1027.0 | 1027.0 |
| Rising/Falling Trend | Rising | |
| Wind Speed (m/s) | 2.00 | 2.00 |
| Wind Dir. (From) | SW | SW |
| Temperature °C | 20.00 | 20.00 |
| SWL Measured from | Ground Level | |

| Ref | GROUND GAS | | | | | | | | | | | | | GROUNDWATER | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow | | $CH_4$ | | $CO_2$ | | $O_2$ | | $H_2S$ | CO | VOC | Differential (Relative) Pressure | Atmos. Pressure | Depth to free product | Depth to water | Depth to base | (e.g. water colour, sheen, odour, damage to well or gas tap, flooded ground etc.)<br>$ For **Depth to water** state<br>**Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)**<br># **For Depth to Product state**<br>**ND (= Not detected - product looked for but absent) or NR (= Not Recorded - instrument used unable to detect product)** |
| | l/hr | | % v/v | | % v/v | | % v/v | | ppm | | | mb | mb | m | m | m | |
| | Max | Steady | Max | Steady | Max | Steady | Min | Steady | Max | Max | Max | | | | | | |
| | The formulae require that only numbers, "<0.1" for ground gas and flow or "DRY" for groundwater are entered in the sheet | | | | | | | | | | | | | | | | |
| CP101 | 0.2 | 0.2 | <0.1 | <0.1 | 5.7 | 5.7 | 7.8 | 7.8 | 1.0 | 1.0 | 2.2 | 0.19 | 1027 | ND | 5.28 | 5.72 | |
| CP102 | <0.1 | <0.1 | <0.1 | <0.1 | 6.9 | 6.9 | 6.4 | 6.4 | 1.0 | 1.0 | 2.6 | -0.09 | 1027 | ND | 4.94 | 5.29 | |
| CP103 | 0.2 | 0.2 | <0.1 | <0.1 | 8.2 | 8.2 | 8.3 | 8.3 | 1.0 | 1.0 | 1.5 | -0.30 | 1027 | ND | 3.74 | 4.55 | |
| CP104 | 0.0 | 0.0 | <0.1 | <0.1 | 6.8 | 6.8 | 9.4 | 9.4 | 1.0 | 1.0 | 0.8 | -0.26 | 1027 | ND | 3.70 | 6.05 | |

| Site Name | Southampton | Job number | 4362 |
|---|---|---|---|
| Client | Blocwork (Eastleigh) LLP and AGS Airports Group Limited | Recorded by | Enitial |
| Date (DD/MM/YYYY) | 27/05/2025 | | |
| Gas Analyser | G505505 | Visit Number | 4 |

| Readings at start | $CH_4$ (% v/v) | <0.1 | $CO_2$ (% v/v) | 0.1 | $O_2$ (% v/v) | 20.9 | $H_2S$ (ppm) | <1.0 | |
|---|---|---|---|---|---|---|---|---|---|
| General comments | | | | | | | | | |

| WEATHER | Start | End |
|---|---|---|
| Time | 8:53 | 10:54 |
| Weather (dry/rain/snow/ice) | Wet, slight precipitation | Wet |
| Pressure (mb) | 1014.0 | 1013.0 |
| Rising/Falling Trend | Falling | |
| Wind Speed (m/s) | 7.00 | 7.00 |
| Wind Dir. (From) | SW | SW |
| Temperature °C | 15.00 | 15.00 |
| SWL Measured from | Ground Level | |

| Ref | GROUND GAS | | | | | | | | | | | | | GROUNDWATER | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow | | $CH_4$ | | $CO_2$ | | $O_2$ | | $H_2S$ | CO | VOC | Differential (Relative) Pressure | Atmos. Pressure | Depth to free product | Depth to water | Depth to base | (e.g. water colour, sheen, odour, damage to well or gas tap, flooded ground etc.)<br>$ For **Depth to water** state<br>**Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)**<br># **For Depth to Product state**<br>**ND (= Not detected - product looked for but absent) or NR (= Not Recorded - instrument used unable to detect product)** |
| | l/hr | | % v/v | | % v/v | | % v/v | | ppm | | | | | | | | |
| | Max | Steady | Max | Steady | Max | Steady | Min | Steady | Max | Max | Max | mb | mb | m | m | m | |
| | The formulae require that only numbers, "<0.1" for ground gas and flow or "DRY" for groundwater are entered in the sheet | | | | | | | | | | | | | | | | |
| CP101 | 0.1 | 0.1 | <0.1 | <0.1 | 7.3 | 7.3 | 7.3 | 7.3 | <1 | 5.0 | 0.2 | 0.65 | 1013 | ND | 5.32 | 5.72 | |
| CP102 | 0.2 | 0.2 | <0.1 | <0.1 | 5.4 | 5.4 | 15.0 | 15.0 | <1 | 6.0 | <0.1 | 0.46 | 1013 | ND | 4.98 | 5.29 | |
| CP103 | 0.3 | 0.3 | <0.1 | <0.1 | 13.6 | 13.6 | 3.7 | 3.7 | <1 | 7.0 | 0.3 | 0.28 | 1013 | ND | 3.84 | 4.55 | |
| CP104 | 0.2 | 0.2 | <0.1 | <0.1 | 2.6 | 2.6 | 18.2 | 18.2 | <1 | 7.0 | 0.2 | 0.51 | 1013 | ND | 3.78 | 6.05 | |

| Version | 1.2 | Issue Date | 18/06/2024 |
|---|---|---|---|

| Site Name | Southampton | Job number | 4362 |
|---|---|---|---|
| Client | Blocwork (Eastleigh) LLP and AGS Airports Group Limited | Recorded by | Enitial |
| Date (DD/MM/YYYY) | 30/06/2025 | | |
| Gas Analyser | G505505 | Visit Number | 5 |

| Readings at start | $CH_4$ (% v/v) | <0.1 | $CO_2$ (% v/v) | 0.1 | $O_2$ (% v/v) | 20.9 | $H_2S$ (ppm) | <1.0 | |
|---|---|---|---|---|---|---|---|---|---|
| General comments | | | | | | | | | |

| WEATHER | Start | End |
|---|---|---|
| Time | 8:24 | 10:23 |
| Weather (dry/rain/snow/ice) | Dry | Dry |
| Pressure (mb) | 1021.0 | 1019.0 |
| Rising/Falling Trend | Risings with c. 10 mbar drop over previous 24 hrs | |
| Wind Speed (m/s) | 2.00 | 2.00 |
| Wind Dir. (From) | SE | SE |
| Temperature °C | 21.00 | 24.00 |
| SWL Measured from | Ground Level | |

| Ref | GROUND GAS | | | | | | | | | | | | | GROUNDWATER | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow | | $CH_4$ | | $CO_2$ | | $O_2$ | | $H_2S$ | CO | VOC | Differential (Relative) Pressure | Atmos. Pressure | Depth to free product | Depth to water | Depth to base | (e.g. water colour, sheen, odour, damage to well or gas tap, flooded ground etc.)<br>$ For Depth to water state<br>Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)<br># For Depth to Product state<br>ND (= Not detected - product looked for but absent) or NR (= Not Recorded - instrument used unable to detect product) |
| | l/hr | | % v/v | | % v/v | | % v/v | | ppm | | | mb | mb | m | m | m | |
| | Max | Steady | Max | Steady | Max | Steady | Min | Steady | Max | Max | Max | | | | | | |
| | The formulae require that only numbers, "<0.1" for ground gas and flow or "DRY" for groundwater are entered in the sheet | | | | | | | | | | | | | | | | |
| CP101 | <0.1 | <0.1 | <0.1 | <0.1 | 9.7 | 9.7 | 7.9 | 7.9 | <1 | 9.0 | 4.0 | 0.77 | 1019 | ND | 5.40 | 5.72 | |
| CP102 | <0.1 | <0.1 | <0.1 | <0.1 | 7.1 | 7.1 | 12.7 | 12.7 | 1.0 | 11.0 | 1.8 | -0.04 | 1019 | ND | 5.00 | 5.30 | |
| CP103 | <0.1 | <0.1 | <0.1 | <0.1 | 9.2 | 9.2 | 11.3 | 11.3 | 1.0 | 12.0 | 2.9 | -0.12 | 1019 | ND | 3.87 | 4.55 | |
| CP104 | 0.1 | 0.1 | <0.1 | <0.1 | 5.4 | 5.4 | 14.4 | 14.4 | 1.0 | 13.0 | 2.7 | -0.47 | 1019 | ND | 3.80 | 6.05 | |

| Version | 1.2 | Issue Date | 18/06/2024 |
|---|---|---|---|

| Site Name | Southampton | Job number | 4362 |
|---|---|---|---|
| Client | Blocwork (Eastleigh) LLP and AGS Airports Group Limited | Recorded by | Enitial |
| Date (DD/MM/YYYY) | 15/07/2025 | | |
| Gas Analyser | G505505 | Visit Number | 6 |

| Readings at start | $CH_4$ (% v/v) | <0.1 | $CO_2$ (% v/v) | 0.1 | $O_2$ (% v/v) | 20.9 | $H_2S$ (ppm) | <1 | |
|---|---|---|---|---|---|---|---|---|---|
| General comments | | | | | | | | | |

| WEATHER | Start | End |
|---|---|---|
| Time | 9:00 | 10:30 |
| Weather (dry/rain/snow/ice) | Dry | Dry |
| Pressure (mb) | 1017.00 | 1017.00 |
| Rising/Falling Trend | Rising | |
| Wind Speed (m/s) | NR | NR |
| Wind Dir. (From) | NR | NR |
| Temperature °C | 19.00 | 20.00 |
| SWL Measured from | Ground Level | |

| Ref | GROUND GAS | | | | | | | | | | | | | GROUNDWATER | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow | | $CH_4$ | | $CO_2$ | | $O_2$ | | $H_2S$ | CO | VOC | Differential (Relative) Pressure | Atmos. Pressure | Depth to free product | Depth to water | Depth to base | (e.g. water colour, sheen, odour, damage to well or gas tap, flooded ground etc.)<br>$ For **Depth to water** state<br>**Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)**<br># **For Depth to Product state**<br>**ND (= Not detected - product looked for but absent) or NR (= Not Recorded - instrument used unable to detect product)** |
| | l/hr | | % v/v | | % v/v | | % v/v | | ppm | | | mb | mb | m | m | m | |
| | Max | Steady | Max | Steady | Max | Steady | Min | Steady | Max | Max | Max | | | | | | |
| | The formulae require that only numbers, "<0.1" for ground gas and flow or "DRY" for groundwater are entered in the sheet | | | | | | | | | | | | | | | | |
| CP101 | 0.1 | 0.1 | <0.1 | <0.1 | 6.6 | 6.6 | 12.8 | 12.8 | <1 | 1.0 | 3.0 | 0.1 | 1017 | ND | 5.33 | 5.72 | |
| CP102 | <0.1 | <0.1 | <0.1 | <0.1 | 2.3 | 2.3 | 17.4 | 17.4 | 1.0 | <1 | 0.9 | 0.1 | 1017 | ND | 5.00 | 5.30 | |
| CP103 | 0.1 | 0.1 | <0.1 | <0.1 | 11.4 | 11.4 | 11.5 | 11.5 | <1 | <1 | 0.2 | 0.2 | 1017 | ND | 4.55 | 4.55 | |
| CP104 | 0.1 | 0.1 | <0.1 | <0.1 | 6.3 | 6.3 | 16.6 | 16.6 | <1 | <1 | 0.4 | 0.7 | 1017 | ND | 6.04 | 6.04 | |

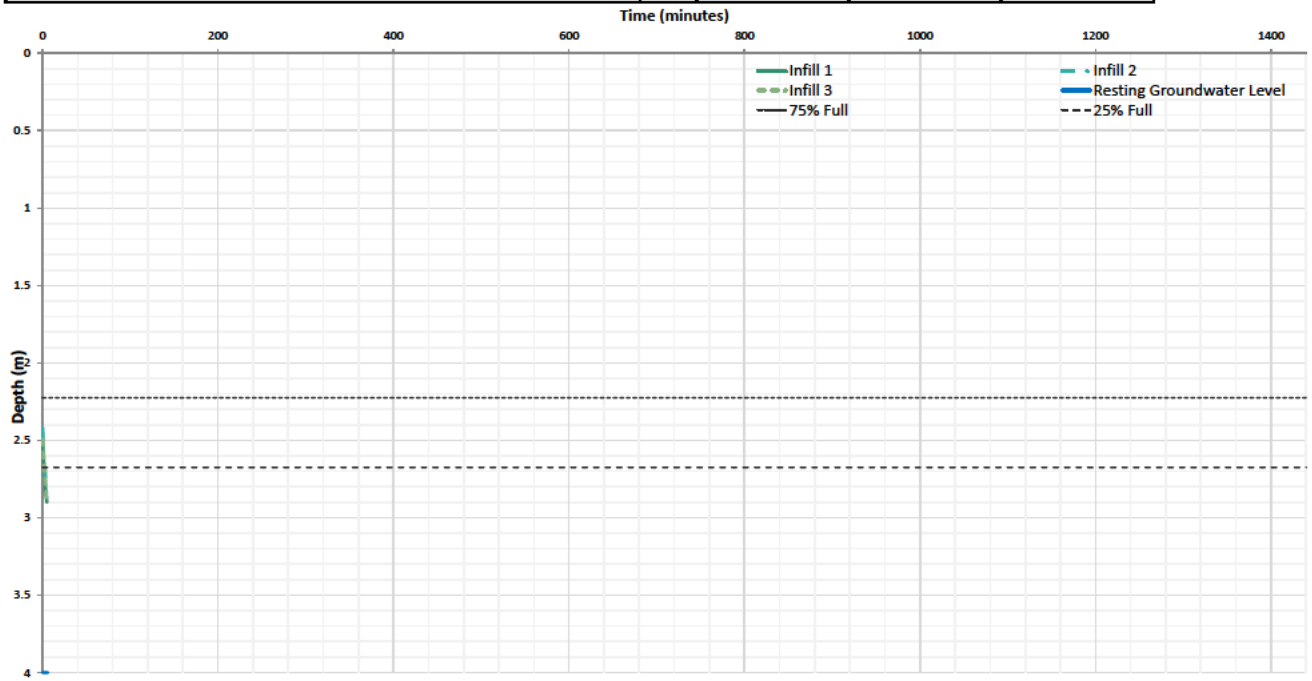
| Version | 1.2 | Issue Date | 18/06/2024 |
|---|---|---|---|

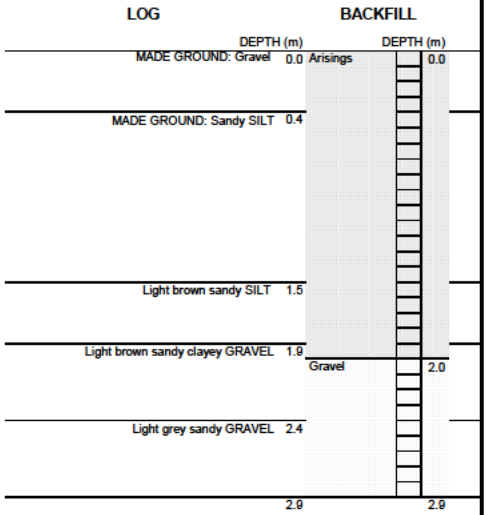
| | units | Infill 1 | Infill 2 | Infill 3 |
|---|---|---|---|---|
| Length | m | | 1.70 | |
| Width | m | | 0.60 | |
| Depth | m | | 2.90 | |
| Gravel type | | | 20mm single size | |
| Voids ratio | | | 0.40 | |
| Resting groundwater level at time of testing | m | | 4.00 | |
| Depth of first reading | m | 2.48 | 2.42 | 2.49 |
| Depth of final reading | m | 2.90 | 2.90 | 2.90 |
| Did soakage test reach 25% of maximum fill depth? | | Yes | Yes | Yes |
| Did soakage test reach near empty? | | Yes | Yes | Yes |
| Depth at 75% full/effective depth | m | 2.59 | 2.54 | 2.59 |
| Depth at 25% full/effective depth | m | 2.80 | 2.78 | 2.80 |
| Time at 75% full/effective depth | mins | 0.95 | 1.00 | 1.14 |
| Time at 25% full/effective depth | mins | 3.21 | 3.78 | 3.68 |
| Vp75 - 25 (volume outflowing between 75% and 25% full/effective depth) | $m^3$ | 0.09 | 0.10 | 0.08 |
| Mean surface area for outflow (50% full/effective depth) | $m^2$ | 1.99 | 2.12 | 1.96 |
| tp75 (time for the water level to fall from 75% to 25% full/effective depth) | mins | 2.26 | 2.78 | 2.54 |
| Soil infiltration rate, f = | m/s | 0.00031819 | 0.00027661 | 0.00027962 |
| or | m/s | 3.2E-04 | 2.8E-04 | 2.8E-04 |

## Recommended soil infiltration rate

| 2.8E-04 | m/s |
|---|---|

***Note:***
***Where water level reaches nearly empty (5% full), soil infiltration based on 'Full' depth. Where water level did not reach nearly empty (5% full), soil infiltration rate is based on 'Effective' drainage achieved only. Where water level did not fall below 25% of the maximum fill level, this is considered to be a 'Failed' test.***



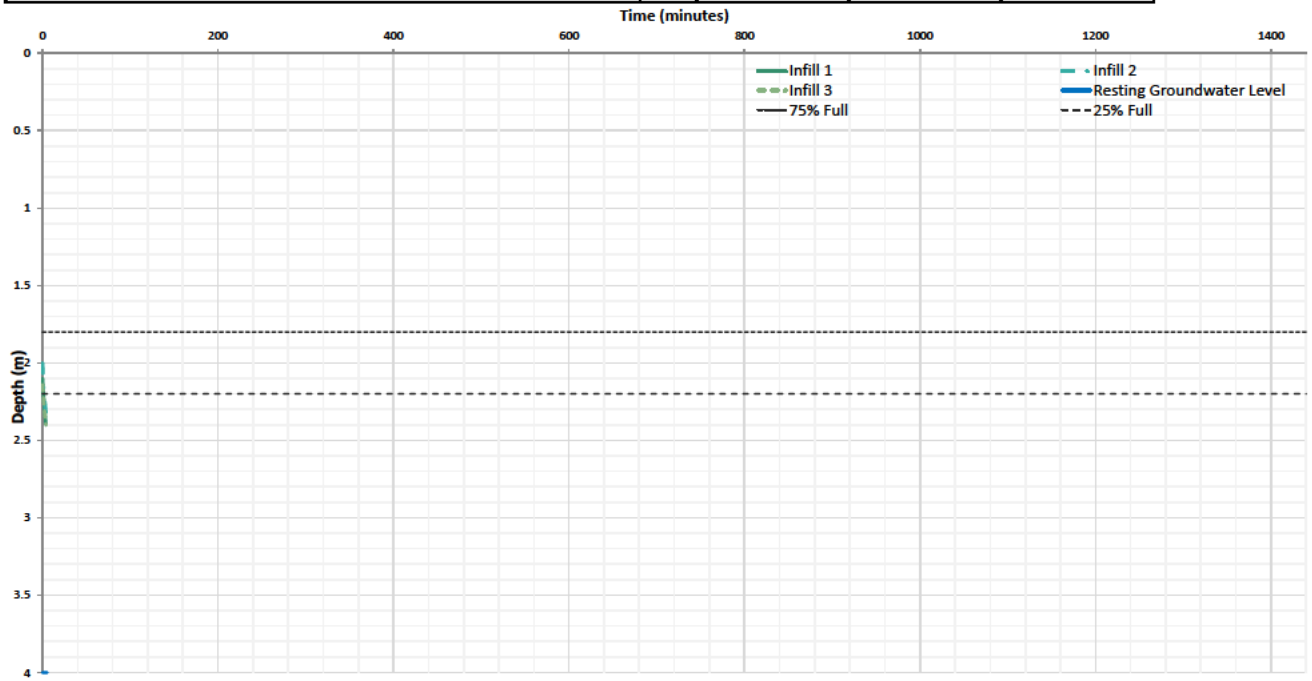

| | | | |
|---|---|---|---|
| TITLE: Soakaway Test Results<br>Navigator Quarter, Southampton<br>Blocwork (Eastleigh) LLP and AGS Airports Limited | *In accordance with BRE Digest 365 (2016)* | DRAWN BY: JCR<br>CHECKED BY: TH<br>DATE: 04/02/2025 | SCALE: Not to Scale<br>REVISION: 1 | PROJECT NUMBER: 4362<br>SOAKAWAY NUMBER: TP103/SA101 |

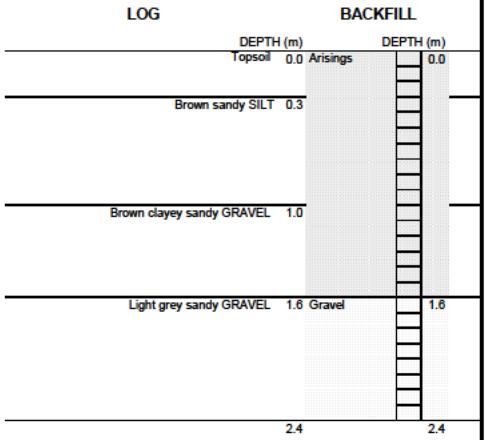
| | units | Infill 1 | Infill 2 | Infill 3 |
|---|---|---|---|---|
| Length | m | | 1.60 | |
| Width | m | | 0.60 | |
| Depth | m | | 2.40 | |
| Gravel type | | | 20mm single size | |
| Voids ratio | | | 0.40 | |
| Resting groundwater level at time of testing | m | | 4.00 | |
| Depth of first reading | m | 2.10 | 2.00 | 2.14 |
| Depth of final reading | m | 2.40 | 2.40 | 2.40 |
| Did soakage test reach 25% of maximum fill depth? | | Yes | Yes | Yes |
| Did soakage test reach near empty? | | Yes | Yes | Yes |
| Depth at 75% full/effective depth | m | 2.18 | 2.10 | 2.21 |
| Depth at 25% full/effective depth | m | 2.33 | 2.30 | 2.34 |
| Time at 75% full/effective depth | mins | 0.83 | 0.83 | 0.81 |
| Time at 25% full/effective depth | mins | 2.79 | 3.50 | 2.75 |
| Vp75 - 25 (volume outflowing between 75% and 25% full/effective depth) | $m^3$ | 0.06 | 0.08 | 0.05 |
| Mean surface area for outflow (50% full/effective depth) | $m^2$ | 1.62 | 1.84 | 1.53 |
| tp75 (time for the water level to fall from 75% to 25% full/effective depth) | mins | 1.95 | 2.67 | 1.94 |
| Soil infiltration rate, f = | m/s | 0.00030352 | 0.00026087 | 0.00028030 |
| or | m/s | 3.0E-04 | 2.6E-04 | 2.8E-04 |

## Recommended soil infiltration rate

| 2.6E-04 | m/s |
|---|---|

***Note:***
***Where water level reaches nearly empty (5% full), soil infiltration based on 'Full' depth. Where water level did not reach nearly empty (5% full), soil infiltration rate is based on 'Effective' drainage achieved only. Where water level did not fall below 25% of the maximum fill level, this is considered to be a 'Failed' test.***




Geo2

TITLE: Soakaway Test Results
Navigator Quarter, Southampton
Blocwork (Eastleigh) LLP and AGS Airports Limited

*In accordance with BRE Digest 365 (2016)*

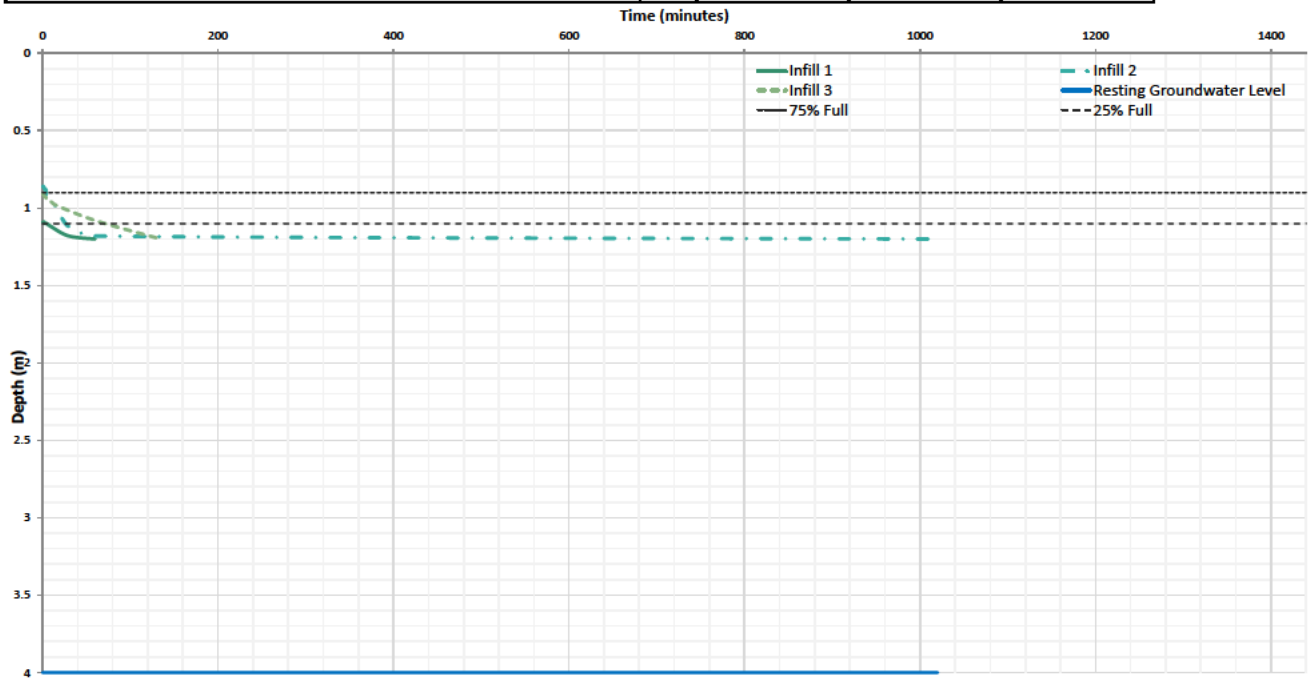
| | | |
|---|---|---|
| DRAWN BY: JCR | SCALE: Not to Scale | PROJECT NUMBER: 4362 |
| CHECKED BY: TH | REVISION: 1 | SOAKAWAY NUMBER: TP104/SA102 |
| DATE: 04/02/2025 | | |

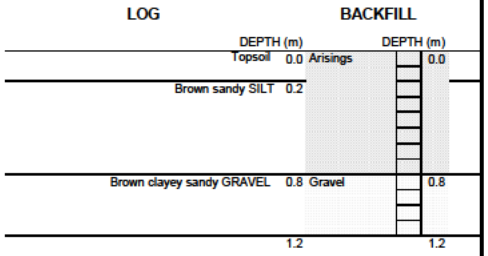
| | units | Infill 1 | Infill 2 | Infill 3 |
|---|---|---|---|---|
| Length | m | | 1.80 | |
| Width | m | | 0.60 | |
| Depth | m | | 1.20 | |
| Gravel type | | | 20mm single size | |
| Voids ratio | | | 0.40 | |
| Resting groundwater level at time of testing | m | | 4.00 | |
| Depth of first reading | m | 1.09 | 0.86 | 0.91 |
| Depth of final reading | m | 1.20 | 1.20 | 1.20 |
| Did soakage test reach 25% of maximum fill depth? | | Yes | Yes | Yes |
| Did soakage test reach near empty? | | Yes | Yes | Yes |
| Depth at 75% full/effective depth | m | 1.12 | 0.95 | 0.98 |
| Depth at 25% full/effective depth | m | 1.17 | 1.12 | 1.13 |
| Time at 75% full/effective depth | mins | 9.38 | 8.57 | 16.13 |
| Time at 25% full/effective depth | mins | 27.50 | 29.42 | 89.69 |
| Vp75 - 25 (volume outflowing between 75% and 25% full/effective depth) | $m^3$ | 0.02 | 0.07 | 0.06 |
| Mean surface area for outflow (50% full/effective depth) | $m^2$ | 1.34 | 1.90 | 1.78 |
| tp75 (time for the water level to fall from 75% to 25% full/effective depth) | mins | 18.13 | 20.85 | 73.56 |
| Soil infiltration rate, f = | m/s | 0.00001626 | 0.00003096 | 0.00000799 |
| or | m/s | 1.6E-05 | 3.1E-05 | 8.0E-06 |

## Recommended soil infiltration rate

| 8.0E-06 | m/s |
|---|---|

***Note:***
***Where water level reaches nearly empty (5% full), soil infiltration based on 'Full' depth. Where water level did not reach nearly empty (5% full), soil infiltration rate is based on 'Effective' drainage achieved only. Where water level did not fall below 25% of the maximum fill level, this is considered to be a 'Failed' test.***




Geo2

TITLE: Soakaway Test Results
Navigator Quarter, Southampton
Blocwork (Eastleigh) LLP and AGS Airports Limited

*In accordance with BRE Digest 365 (2016)*

| | | |
|---|---|---|
| DRAWN BY: JCR | SCALE: Not to Scale | PROJECT NUMBER: 4362 |
| CHECKED BY: TH | REVISION: 1 | SOAKAWAY NUMBER: TP108/SA103 |
| DATE: 04/02/2025 -05/02/2025 | | |

# Appendix D – Chemical Soil Results

GEO2 Remediation Ltd
Coniston House
Louisa Street
Idle
BD10 8NE

**e:** Megan.OKelly@geo2.co.uk
jessica.rowe@geo2.co.uk

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

**t:** 01923 225404
**f:** 01923 237404
**e:** reception@i2analytical.com

# Analytical Report Number : 25-006218

| | | | |
|---|---|---|---|
| **Project / Site name:** | Southampton | **Samples received on:** | 10/02/2025 |
| **Your job number:** | 4362 | **Samples instructed on/ Analysis started on:** | 10/02/2025 |
| **Your order number:** | 3569 | **Analysis completed by:** | 17/02/2025 |
| **Report Issue Number:** | 1 | **Report issued on:** | 17/02/2025 |
| **Samples Analysed:** | 3 soil samples - 3 2stage samples | | |

[redacted]

**Signed:**

Caterina Bentley
Customer Service Advisor
**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 |
| air | - once the analysis is complete |

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 25-006218**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448795 | 448796 | 448797 |
|---|---|---|---|---|---|---|
| Sample Reference | | | | HP101 | HP104 | HP105 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied |
| Water Matrix | | | | N/A | N/A | N/A |
| Depth (m) | | | | 0.50-0.60 | 0.50-0.55 | 0.70-0.75 |
| Date Sampled | | | | 05/02/2025 | 05/02/2025 | 05/02/2025 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Test Limit of detection | Test Accreditation Status | | | |
| Stone Content | % | 0.1 | NONE | 20 | 26.2 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 15 | 23 | 26 |
| Total mass of sample received | kg | 0.1 | NONE | 0.8 | 0.6 | 0.6 |
| **General Inorganics** | | | | | | |
| pH (L005B) | pH Units | N/A | MCERTS | 7.7 | 7.3 | 7.7 |
| Total Organic Carbon (TOC) – Manual | % | 0.1 | MCERTS | 1.4 | 4.5 | 4.3 |
| Loss on Ignition @ 450°C | % | 0.2 | MCERTS | 3.9 | 9 | 16 |
| Acid Neutralisation Capacity | +/- mmol/kg | -9999 | NONE | 1.2 | 1.7 | 7.2 |
| **Speciated PAHs** | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 0.16 | 0.11 | 0.26 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.07 | 0.11 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | 0.17 | < 0.05 | 0.07 |
| Fluorene | mg/kg | 0.05 | MCERTS | 0.19 | 0.06 | 0.06 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 0.91 | 0.9 | 1.1 |
| Anthracene | mg/kg | 0.05 | MCERTS | 0.28 | < 0.05 | 0.26 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 1.2 | 0.99 | 2.6 |
| Pyrene | mg/kg | 0.05 | MCERTS | 0.95 | 0.76 | 2.3 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 0.54 | 0.25 | 1.5 |
| Chrysene | mg/kg | 0.05 | MCERTS | 0.52 | 0.49 | 1.5 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.63 | 0.53 | 1.6 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.27 | 0.2 | 0.54 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 0.55 | 0.36 | 1.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 0.27 | 0.19 | 0.44 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.15 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 0.3 | 0.18 | 0.47 |
| Coronene | mg/kg | 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 |
| **Total PAH** | | | | | | |
| Total WAC-17 PAHs | mg/kg | 0.85 | NONE | 6.9 | 5.08 | 13.9 |
| **Petroleum Hydrocarbons** | | | | | | |
| Mineral Oil (EC10 - EC40) EH_CU_1D_AL | mg/kg | 10 | NONE | < 10 | < 10 | 35 |
| **VOCs** | | | | | | |
| Benzene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 |
| Toluene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | 18 |
| Ethylbenzene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 |
| p & m-Xylene | µg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 |
| o-Xylene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 |
| Total BTEX | µg/kg | 10 | MCERTS | < 10 | < 10 | 18 |

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**Analytical Report Number: 25-006218**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448795 | 448796 | 448797 |
|---|---|---|---|---|---|---|
| Sample Reference | | | | HP101 | HP104 | HP105 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied |
| Water Matrix | | | | N/A | N/A | N/A |
| Depth (m) | | | | 0.50-0.60 | 0.50-0.55 | 0.70-0.75 |
| Date Sampled | | | | 05/02/2025 | 05/02/2025 | 05/02/2025 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Test Limit of detection | Test Accreditation Status | | | |
| **PCBs by GC-MS** | | | | | | |
| PCB Congener 28 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 |
| PCB Congener 52 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 |
| PCB Congener 101 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 |
| PCB Congener 118 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 |
| PCB Congener 138 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 |
| PCB Congener 153 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 |
| PCB Congener 180 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 |
| Total PCBs | mg/kg | 0.007 | MCERTS | < 0.007 | < 0.007 | < 0.007 |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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**Analytical Report Number: 25-006218**
**Project / Site name: Southampton**

**Your Order No: 3569**

| Lab Sample Number | | | | 448795 | 448796 | 448797 |
|---|---|---|---|---|---|---|
| Sample Reference | | | | HP101 | HP104 | HP105 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied |
| Water Matrix | | | | N/A | N/A | N/A |
| Depth (m) | | | | 0.50-0.60 | 0.50-0.55 | 0.70-0.75 |
| Date Sampled | | | | 05/02/2025 | 05/02/2025 | 05/02/2025 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Two-stage Leachate Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | |
| Dry matter | % | 0.1 | NONE | 81 | 69 | 79 |
| Moisture of sample | % | N/A | NONE | 23 | 44 | 27 |
| Recovered volume A | l | N/A | NONE | 0.14 | 0.18 | 0.25 |
| Volume used first stage | l | N/A | NONE | 0.309 | 0.272 | 0.304 |
| **General 2:1** | | | | | | |
| Sulphate as $SO_4$ | mg/l | 0.045 | ISO 17025 | 5.6 | 5.5 | 13 |
| Monohydric Phenols | mg/l | 0.16 | ISO 17025 | < 0.16 | < 0.16 | < 0.16 |
| Chloride | mg/l | 4 | ISO 17025 | < 4.0 | < 4.0 | < 4.0 |
| Fluoride | mg/l | 0.05 | ISO 17025 | 0.65 | 0.23 | 0.17 |
| Dissolved Organic Carbon | mg/l | 0.1 | NONE | 16.9 | 32.7 | 17 |
| Total Dissolved Solids | mg/l | 6 | ISO 17025 | 83 | 110 | 91 |
| Arsenic | mg/l | 0.002 | ISO 17025 | 0.0024 | 0.0027 | 0.0095 |
| Cadmium | mg/l | 0.0001 | ISO 17025 | < 0.00010 | < 0.00010 | < 0.00010 |
| Chromium | mg/l | 0.0006 | ISO 17025 | < 0.00060 | < 0.00060 | < 0.00060 |
| Lead | mg/l | 0.0017 | ISO 17025 | 0.0019 | 0.0075 | 0.015 |
| Mercury | mg/l | 0.0007 | ISO 17025 | < 0.00070 | < 0.00070 | < 0.00070 |
| Selenium | mg/l | 0.005 | ISO 17025 | < 0.0050 | < 0.0050 | < 0.0050 |
| Copper | mg/l | 0.0007 | ISO 17025 | 0.027 | 0.067 | 0.021 |
| Nickel | mg/l | 0.0009 | ISO 17025 | 0.0022 | 0.0053 | 0.003 |
| Zinc | mg/l | 0.0009 | ISO 17025 | 0.0074 | 0.028 | 0.014 |
| Antimony | mg/l | 0.002 | ISO 17025 | < 0.0020 | < 0.0020 | < 0.0020 |
| Molybdenum | mg/l | 0.0014 | ISO 17025 | 0.0034 | 0.0041 | 0.0044 |
| Barium | mg/l | 0.0012 | ISO 17025 | 0.03 | 0.033 | 0.042 |
| **General 8:1** | | | | | | |
| Sulphate as $SO_4$ | mg/l | 0.045 | ISO 17025 | 5.1 | 4.6 | 9.2 |
| Monohydric Phenols | mg/l | 0.13 | ISO 17025 | < 0.13 | < 0.13 | < 0.13 |
| Chloride | mg/l | 4 | ISO 17025 | < 4.0 | < 4.0 | < 4.0 |
| Fluoride | mg/l | 0.05 | ISO 17025 | 0.41 | 0.24 | 0.16 |
| Dissolved Organic Carbon | mg/l | 0.1 | NONE | 16 | 23 | 27 |
| Total Dissolved Solids | mg/l | 6 | ISO 17025 | 39 | 43 | 68 |
| Arsenic | mg/l | 0.002 | ISO 17025 | < 0.0020 | 0.0041 | 0.0097 |
| Cadmium | mg/l | 0.0001 | ISO 17025 | 0.0001 | < 0.00010 | < 0.00010 |
| Chromium | mg/l | 0.0006 | ISO 17025 | 0.0023 | 0.003 | 0.001 |
| Lead | mg/l | 0.0017 | ISO 17025 | 0.012 | 0.011 | 0.022 |
| Mercury | mg/l | 0.0007 | ISO 17025 | < 0.0007 | < 0.0007 | < 0.0007 |
| Selenium | mg/l | 0.005 | ISO 17025 | < 0.0050 | < 0.0050 | < 0.0050 |
| Copper | mg/l | 0.0007 | ISO 17025 | 0.0078 | 0.013 | 0.012 |
| Nickel | mg/l | 0.0009 | ISO 17025 | 0.0027 | 0.0048 | 0.0036 |
| Zinc | mg/l | 0.0009 | ISO 17025 | 0.012 | 0.023 | 0.0058 |
| Antimony | mg/l | 0.002 | ISO 17025 | < 0.0020 | < 0.0020 | < 0.0020 |
| Molybdenum | mg/l | 0.0014 | ISO 17025 | < 0.0014 | < 0.0014 | 0.0015 |
| Barium | mg/l | 0.0012 | ISO 17025 | 0.023 | 0.025 | 0.031 |

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**Analytical Report Number: 25-006218**
**Project / Site name: Southampton**

**Your Order No: 3569**

| Lab Sample Number | | | | 448795 | 448796 | 448797 |
|---|---|---|---|---|---|---|
| Sample Reference | | | | HP101 | HP104 | HP105 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied |
| Water Matrix | | | | N/A | N/A | N/A |
| Depth (m) | | | | 0.50-0.60 | 0.50-0.55 | 0.70-0.75 |
| Date Sampled | | | | 05/02/2025 | 05/02/2025 | 05/02/2025 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Two-stage Leachate Analysis) | Units | Test Limit of detection | Test Accreditation Status | | | |
| **General 10:1** | | | | | | |
| Sulphate as $SO_4$ | mg/kg | 0.45 | NONE | 51 | 47 | 98 |
| Monohydric Phenols | mg/kg | 0.5 | NONE | < 0.50 | < 0.50 | < 0.50 |
| Chloride | mg/kg | 15 | NONE | 30 | 29 | 28 |
| Fluoride | mg/kg | 0.2 | NONE | 4.3 | 2.4 | 1.6 |
| Dissolved Organic Carbon | mg/kg | 1 | NONE | 162 | 238 | 254 |
| Total Dissolved Solids | mg/kg | 60 | NONE | 430 | 500 | 710 |
| Arsenic | mg/kg | 0.02 | NONE | < 0.020 | 0.039 | 0.096 |
| Cadmium | mg/kg | 0.001 | NONE | < 0.0010 | < 0.0010 | < 0.0010 |
| Chromium | mg/kg | 0.006 | NONE | 0.021 | 0.027 | 0.0086 |
| Lead | mg/kg | 0.017 | NONE | 0.11 | 0.1 | 0.21 |
| Mercury | mg/kg | 0.007 | NONE | < 0.0070 | < 0.0070 | < 0.0070 |
| Selenium | mg/kg | 0.05 | NONE | < 0.050 | < 0.050 | < 0.050 |
| Copper | mg/kg | 0.007 | NONE | 0.094 | 0.19 | 0.13 |
| Nickel | mg/kg | 0.009 | NONE | 0.027 | 0.048 | 0.035 |
| Zinc | mg/kg | 0.009 | NONE | 0.11 | 0.24 | 0.07 |
| Antimony | mg/kg | 0.02 | NONE | < 0.020 | < 0.020 | < 0.020 |
| Molybdenum | mg/kg | 0.014 | NONE | < 0.014 | 0.015 | 0.019 |
| Barium | mg/kg | 0.012 | NONE | 0.23 | 0.26 | 0.33 |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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**i2 Analytical**
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

## Waste Acceptance Criteria Analytical Results

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Report No:** | **25-006218** | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | **Client:** | **GEO2REMED** | |
| | | | | | | | |
| **Location** | **Southampton** | | | | | | |
| **Lab Reference (Sample Number)** | 448795 | | | | **Landfill Waste Acceptance Criteria Limits** | | |
| **Sampling Date** | 05/02/2025 | | | | Inert Waste Landfill | Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill | Hazardous Waste Landfill |
| **Sample ID** | HP101 | | | | | | |
| **Depth (m)** | 0.50-0.60 | | | | | | |
| **Solid Waste Analysis** | | | | | | | |
| TOC (%)** | 1.4 | | | | 3% | 5% | 6% |
| Loss on Ignition (%) ** | 3.9 | | | | -- | -- | 10% |
| BTEX (µg/kg)** | < 10 | | | | 6000 | -- | -- |
| Sum of PCBs (mg/kg)** | < 0.007 | | | | 1 | -- | -- |
| Mineral Oil (mg/kg) EH_1D_CU_AL | < 10 | | | | 500 | -- | -- |
| Total PAH (WAC-17) (mg/kg) | 6.90 | | | | 100 | -- | -- |
| pH (units)** | 7.7 | | | | -- | >6 | -- |
| Acid Neutralisation Capacity (mmol / kg) | 1.2 | | | | -- | To be evaluated | To be evaluated |
| **Eluate Analysis** (BS EN 12457 - 3 preparation utilising end over end leaching procedure) | 2:1 mg/l | 8:1 mg/l | | Cumulative 10:1 mg/kg | Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg) | | |
| Arsenic * | 0.0024 | < 0.0020 | | < 0.020 | 0.5 | 2 | 25 |
| Barium * | 0.030 | 0.023 | | 0.23 | 20 | 100 | 300 |
| Cadmium * | < 0.00010 | 0.00010 | | < 0.0010 | 0.04 | 1 | 5 |
| Chromium * | < 0.00060 | 0.0023 | | 0.021 | 0.5 | 10 | 70 |
| Copper * | 0.027 | 0.0078 | | 0.094 | 2 | 50 | 100 |
| Mercury * | < 0.00070 | < 0.0007 | | < 0.0070 | 0.01 | 0.2 | 2 |
| Molybdenum * | 0.0034 | < 0.0014 | | < 0.014 | 0.5 | 10 | 30 |
| Nickel * | 0.0022 | 0.0027 | | 0.027 | 0.4 | 10 | 40 |
| Lead * | 0.0019 | 0.012 | | 0.11 | 0.5 | 10 | 50 |
| Antimony * | < 0.0020 | < 0.0020 | | < 0.020 | 0.06 | 0.7 | 5 |
| Selenium * | < 0.0050 | < 0.0050 | | < 0.050 | 0.1 | 0.5 | 7 |
| Zinc * | 0.0074 | 0.012 | | 0.11 | 4 | 50 | 200 |
| Chloride * | < 4.0 | < 4.0 | | 30 | 800 | 15000 | 25000 |
| Fluoride* | 0.65 | 0.41 | | 4.3 | 10 | 150 | 500 |
| Sulphate * | 5.6 | 5.1 | | 51 | 1000 | 20000 | 50000 |
| TDS* | 83 | 39 | | 430 | 4000 | 60000 | 100000 |
| Phenol Index (Monohydric Phenols) * | < 0.16 | < 0.13 | | < 0.50 | 1 | - | - |
| DOC | 16.9 | 16 | | 162 | 500 | 800 | 1000 |
| | | | | | | | |
| **Leach Test Information** | | | | | | | |
| | | | | | | | |
| Stone Content (%) | 20.0 | | | | | | |
| Sample Mass (kg) | 0.8 | | | | | | |
| Dry Matter (%) | 85 | | | | | | |
| Moisture (%) | 15 | | | | | | |
| **Stage 1** | | | | | | | |
| Volume Eluate L2 (litres) | 0.309 | | | | | | |
| Filtered Eluate VE1 (litres) | 0.14 | | | | | | |
| | | | | | | | |
| | | | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.
Where colour coding is used on this report, this is for guidance purposes only. This does not constitute a statement of conformity of pass or fail.
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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**i2 Analytical**
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

## Waste Acceptance Criteria Analytical Results

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Report No:** | **25-006218** | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | **Client: GEO2REMED** | | |
| | | | | | | | |
| **Location** | **Southampton** | | | | | | |
| **Lab Reference (Sample Number)** | 448796 | | | | **Landfill Waste Acceptance Criteria Limits** | | |
| **Sampling Date** | 05/02/2025 | | | | Inert Waste Landfill | Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill | Hazardous Waste Landfill |
| **Sample ID** | HP104 | | | | | | |
| **Depth (m)** | 0.50-0.55 | | | | | | |
| **Solid Waste Analysis** | | | | | | | |
| TOC (%)** | 4.5 | | | | 3% | 5% | 6% |
| Loss on Ignition (%) ** | 9.0 | | | | -- | -- | 10% |
| BTEX (µg/kg)** | < 10 | | | | 6000 | -- | -- |
| Sum of PCBs (mg/kg)** | < 0.007 | | | | 1 | -- | -- |
| Mineral Oil (mg/kg) EH_1D_CU_AL | < 10 | | | | 500 | -- | -- |
| Total PAH (WAC-17) (mg/kg) | 5.08 | | | | 100 | -- | -- |
| pH (units)** | 7.3 | | | | -- | >6 | -- |
| Acid Neutralisation Capacity (mmol / kg) | 1.7 | | | | -- | To be evaluated | To be evaluated |
| **Eluate Analysis** (BS EN 12457 - 3 preparation utilising end over end leaching procedure) | 2:1 mg/l | 8:1 mg/l | | Cumulative 10:1 mg/kg | Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg) | | |
| Arsenic * | 0.0027 | 0.0041 | | 0.039 | 0.5 | 2 | 25 |
| Barium * | 0.033 | 0.025 | | 0.26 | 20 | 100 | 300 |
| Cadmium * | < 0.00010 | < 0.00010 | | < 0.0010 | 0.04 | 1 | 5 |
| Chromium * | < 0.00060 | 0.0030 | | 0.027 | 0.5 | 10 | 70 |
| Copper * | 0.067 | 0.013 | | 0.19 | 2 | 50 | 100 |
| Mercury * | < 0.00070 | < 0.0007 | | < 0.0070 | 0.01 | 0.2 | 2 |
| Molybdenum * | 0.0041 | < 0.0014 | | 0.015 | 0.5 | 10 | 30 |
| Nickel * | 0.0053 | 0.0048 | | 0.048 | 0.4 | 10 | 40 |
| Lead * | 0.0075 | 0.011 | | 0.10 | 0.5 | 10 | 50 |
| Antimony * | < 0.0020 | < 0.0020 | | < 0.020 | 0.06 | 0.7 | 5 |
| Selenium * | < 0.0050 | < 0.0050 | | < 0.050 | 0.1 | 0.5 | 7 |
| Zinc * | 0.028 | 0.023 | | 0.24 | 4 | 50 | 200 |
| Chloride * | < 4.0 | < 4.0 | | 29 | 800 | 15000 | 25000 |
| Fluoride* | 0.23 | 0.24 | | 2.4 | 10 | 150 | 500 |
| Sulphate * | 5.5 | 4.6 | | 47 | 1000 | 20000 | 50000 |
| TDS* | 110 | 43 | | 500 | 4000 | 60000 | 100000 |
| Phenol Index (Monohydric Phenols) * | < 0.16 | < 0.13 | | < 0.50 | 1 | - | - |
| DOC | 32.7 | 23 | | 238 | 500 | 800 | 1000 |
| | | | | | | | |
| **Leach Test Information** | | | | | | | |
| | | | | | | | |
| Stone Content (%) | 26.2 | | | | | | |
| Sample Mass (kg) | 0.6 | | | | | | |
| Dry Matter (%) | 77 | | | | | | |
| Moisture (%) | 23 | | | | | | |
| **Stage 1** | | | | | | | |
| Volume Eluate L2 (litres) | 0.272 | | | | | | |
| Filtered Eluate VE1 (litres) | 0.18 | | | | | | |
| | | | | | | | |
| | | | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited

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Where colour coding is used on this report, this is for guidance purposes only. This does not constitute a statement of conformity of pass or fail.
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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**i2 Analytical**
7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

## Waste Acceptance Criteria Analytical Results

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Report No:** | **25-006218** | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | **Client: GEO2REMED** | | |
| | | | | | | | |
| **Location** | **Southampton** | | | | | | |
| **Lab Reference (Sample Number)** | 448797 | | | | **Landfill Waste Acceptance Criteria Limits** | | |
| **Sampling Date** | 05/02/2025 | | | | Inert Waste Landfill | Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill | Hazardous Waste Landfill |
| **Sample ID** | HP105 | | | | | | |
| **Depth (m)** | 0.70-0.75 | | | | | | |
| **Solid Waste Analysis** | | | | | | | |
| TOC (%)** | 4.3 | | | | 3% | 5% | 6% |
| Loss on Ignition (%) ** | 16 | | | | -- | -- | 10% |
| BTEX (µg/kg)** | 18 | | | | 6000 | -- | -- |
| Sum of PCBs (mg/kg)** | < 0.007 | | | | 1 | -- | -- |
| Mineral Oil (mg/kg) EH_1D_CU_AL | 35 | | | | 500 | -- | -- |
| Total PAH (WAC-17) (mg/kg) | 13.9 | | | | 100 | -- | -- |
| pH (units)** | 7.7 | | | | -- | >6 | -- |
| Acid Neutralisation Capacity (mmol / kg) | 7.2 | | | | -- | To be evaluated | To be evaluated |
| **Eluate Analysis** (BS EN 12457 - 3 preparation utilising end over end leaching procedure) | 2:1 mg/l | 8:1 mg/l | | Cumulative 10:1 mg/kg | Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg) | | |
| Arsenic * | 0.0095 | 0.0097 | | 0.096 | 0.5 | 2 | 25 |
| Barium * | 0.042 | 0.031 | | 0.33 | 20 | 100 | 300 |
| Cadmium * | < 0.00010 | < 0.00010 | | < 0.0010 | 0.04 | 1 | 5 |
| Chromium * | < 0.00060 | 0.0010 | | 0.0086 | 0.5 | 10 | 70 |
| Copper * | 0.021 | 0.012 | | 0.13 | 2 | 50 | 100 |
| Mercury * | < 0.00070 | < 0.0007 | | < 0.0070 | 0.01 | 0.2 | 2 |
| Molybdenum * | 0.0044 | 0.0015 | | 0.019 | 0.5 | 10 | 30 |
| Nickel * | 0.0030 | 0.0036 | | 0.035 | 0.4 | 10 | 40 |
| Lead * | 0.015 | 0.022 | | 0.21 | 0.5 | 10 | 50 |
| Antimony * | < 0.0020 | < 0.0020 | | < 0.020 | 0.06 | 0.7 | 5 |
| Selenium * | < 0.0050 | < 0.0050 | | < 0.050 | 0.1 | 0.5 | 7 |
| Zinc * | 0.014 | 0.0058 | | 0.070 | 4 | 50 | 200 |
| Chloride * | < 4.0 | < 4.0 | | 28 | 800 | 15000 | 25000 |
| Fluoride* | 0.17 | 0.16 | | 1.6 | 10 | 150 | 500 |
| Sulphate * | 13 | 9.2 | | 98 | 1000 | 20000 | 50000 |
| TDS* | 91 | 68 | | 710 | 4000 | 60000 | 100000 |
| Phenol Index (Monohydric Phenols) * | < 0.16 | < 0.13 | | < 0.50 | 1 | - | - |
| DOC | 17.0 | 27 | | 254 | 500 | 800 | 1000 |
| | | | | | | | |
| **Leach Test Information** | | | | | | | |
| | | | | | | | |
| Stone Content (%) | < 0.1 | | | | | | |
| Sample Mass (kg) | 0.6 | | | | | | |
| Dry Matter (%) | 74 | | | | | | |
| Moisture (%) | 26 | | | | | | |
| **Stage 1** | | | | | | | |
| Volume Eluate L2 (litres) | 0.304 | | | | | | |
| Filtered Eluate VE1 (litres) | 0.25 | | | | | | |
| | | | | | | | |
| | | | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.
Where colour coding is used on this report, this is for guidance purposes only. This does not constitute a statement of conformity of pass or fail.
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 : 25-006218**
**Project / Site name: Southampton**

* 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 * |
|---|---|---|---|---|
| 448795 | HP101 | None Supplied | 0.50-0.60 | Brown clay and sand with stones |
| 448796 | HP104 | None Supplied | 0.50-0.55 | Brown clay and sand with vegetation and stones |
| 448797 | HP105 | None Supplied | 0.70-0.75 | Brown sand with gravel |

**Analytical Report Number : 25-006218**
**Project / Site name: Southampton**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)**
**Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| pH at 20°C in soil | Determination of pH in soil by addition of water followed by electrometric measurement | In-house method | L005B | W | MCERTS |
| 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 |
| Total organic carbon in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method) | In-house method | L023B | D | MCERTS |
| PCB's By GC-MS in soil | Determination of PCB by extraction with hexane followed by GC-MS | In-house method based on USEPA 8082 | L027B | D | MCERTS |
| TDS in WAC leachate (BS EN 12457-3 Prep) | Determination of total dissolved solids in leachate by electrometric measurement | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed. | L031B | W | ISO 17025 |
| Fluoride in WAC leachate (BS EN 12457-3 Prep) | Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed. | L033B | W | ISO 17025 |
| DOC in WAC leachate (BS EN 12457-3 Prep) | Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed. | L037B | W | NONE |
| Metals in WAC leachate (BS EN 12457-3 Prep) | Determination of metals in leachate by acidification followed by ICP-OES | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed | L039B | W | ISO 17025 |
| Sulphate in WAC leachate (BS EN 12457-3 Prep) | Determination of sulphate in leachate by acidification followed by ICP-OES | In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed | L039B | W | ISO 17025 |
| Preparation WAC leachate | | In-house method | L043B | W | NONE |
| Acid neutralisation capacity of soil | Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe | In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance | L046B | W | NONE |
| Loss on ignition of soil @ 450°C | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | In-house method | L047-PL | D | MCERTS |
| Speciated 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 | MCERTS |

**Analytical Report Number : 25-006218**
**Project / Site name: Southampton**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)**
**Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| BTEX and/or Volatile organic compounds in soil | Determination of volatile organic compounds in soil by headspace GC-MS | In-house method based on USEPA 8260 | L073B | W | MCERTS |
| Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil | Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS | In-house method | L076B/L088-PL | D/W | NONE |
| Phenol Index in WAC leachate (BS EN 12457-3 Prep) | Determination of monohydric phenols in leachate by continuous flow analyser | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L080-PL | W | ISO 17025 |
| Chloride in WAC leachate (BS EN 12457-3 Prep) | Determination of Chloride colorimetrically by discrete analyser | In-house based on MEWAM Method ISBN 0117516260 | L082B | 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.**

## 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 - underscore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total |

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

GEO2 Remediation Ltd
Coniston House
Louisa Street
Idle
BD10 8NE

e: Megan.OKelly@geo2.co.uk
jessica.rowe@geo2.co.uk

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

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

# Analytical Report Number : 25-006220

| | | | |
|---|---|---|---|
| **Project / Site name:** | Southampton | **Samples received on:** | 10/02/2025 |
| **Your job number:** | 4362 | **Samples instructed on/ Analysis started on:** | 10/02/2025 |
| **Your order number:** | 3569 | **Analysis completed by:** | 17/02/2025 |
| **Report Issue Number:** | 1 | **Report issued on:** | 17/02/2025 |
| **Samples Analysed:** | 24 soil samples | | |

[redacted]

**Signed:**

Dominika Liana
Junior 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 |
| air | - once the analysis is complete |

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448801 | 448802 | 448803 | 448804 | 448805 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CP101 | CP103 | CP103 | TP101 | TP102 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | N/A | N/A | N/A | N/A | N/A |
| **Depth (m)** | | | | 0.50-0.60 | 3.00-3.20 | 4.20-4.30 | 0.20-0.30 | 0.50-0.60 |
| **Date Sampled** | | | | 03/02/2025 | 04/02/2025 | 04/02/2025 | 04/02/2025 | 04/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | 48.6 | < 0.1 | 45 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 18 | 11 | 21 | 7.2 | 16 |
| Total mass of sample received | kg | 0.1 | NONE | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| **Asbestos** | | | | | | | | |
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected | - | - | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | KMC | - | - | KMC | KMC |
| **General Inorganics** | | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | - | 8.5 | 8.2 | - | - |
| Total Sulphate as $SO_4$ | % | 0.005 | MCERTS | - | - | 0.051 | - | - |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | - | 32 | 500 | - | - |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | - | 16.1 | 252 | - | - |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | - | - | - | - |
| Total Sulphur | mg/kg | 50 | MCERTS | - | - | 7800 | - | - |
| Total Sulphur | % | 0.005 | MCERTS | - | - | 0.783 | - | - |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | - | - | 0.9 | - | 1.9 |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | - | - | - | - |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | 0.05 | 0.08 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | 0.14 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | 0.15 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.12 | < 0.05 | 0.1 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 0.3 | 0.27 | 0.12 | 2.2 | 0.58 |
| Anthracene | mg/kg | 0.05 | MCERTS | 0.06 | < 0.05 | < 0.05 | 0.75 | 0.16 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 0.71 | < 0.05 | < 0.05 | 7.4 | 1.3 |
| Pyrene | mg/kg | 0.05 | MCERTS | 0.63 | < 0.05 | < 0.05 | 8.8 | 1.1 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 0.37 | < 0.05 | < 0.05 | 4.3 | 0.63 |
| Chrysene | mg/kg | 0.05 | MCERTS | 0.41 | < 0.05 | < 0.05 | 4.4 | 0.62 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.67 | < 0.05 | < 0.05 | 5.8 | 0.92 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.22 | < 0.05 | < 0.05 | 2.1 | 0.29 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 0.4 | < 0.05 | < 0.05 | 4.9 | 0.67 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 0.23 | < 0.05 | < 0.05 | 2.4 | 0.31 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | 0.67 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 0.26 | < 0.05 | < 0.05 | 2.6 | 0.34 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 4.25 | < 0.80 | < 0.80 | 46.8 | 7.07 |

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**Analytical Report Number: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448801 | 448802 | 448803 | 448804 | 448805 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CP101 | CP103 | CP103 | TP101 | TP102 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | N/A | N/A | N/A | N/A | N/A |
| **Depth (m)** | | | | 0.50-0.60 | 3.00-3.20 | 4.20-4.30 | 0.20-0.30 | 0.50-0.60 |
| **Date Sampled** | | | | 03/02/2025 | 04/02/2025 | 04/02/2025 | 04/02/2025 | 04/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 7.8 | 4 | 7.6 | 8.4 | 9.9 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | 0.4 | < 0.2 | < 0.2 | 0.4 | 0.4 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | < 1.8 | < 1.8 | < 1.8 | < 1.8 | < 1.8 |
| Chromium (III) | mg/kg | 1 | NONE | 23 | 17 | 17 | 18 | 22 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 23 | 17 | 17 | 18 | 22 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 37 | 8.8 | 11 | 22 | 57 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 57 | 7.5 | 11 | 52 | 120 |
| 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 | 15 | 14 | 18 | 12 | 20 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 180 | 28 | 48 | 89 | 90 |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | - | - | - | - |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | - | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPHCWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | < 0.010 | 0.033 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | < 1.0 | 2.1 | < 1.0 | < 1.0 | < 1.0 |
| TPHCWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | < 2.0 | 41 | 11 | < 2.0 | < 2.0 |
| TPHCWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | 80 | 20 | < 8.0 | < 8.0 |
| TPHCWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | 110 | 26 | 31 | < 8.0 |
| TPHCWG - Aliphatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | NONE | < 10 | 230 | 57 | 31 | < 10 |
| TPHCWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.02 | MCERTS | < 0.020 | < 0.020 | < 0.020 | < 0.020 | < 0.020 |
| TPHCWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPHCWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | < 2.0 | 26 | 12 | < 2.0 | < 2.0 |
| TPHCWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | 44 | 13 | 20 | < 10 |
| TPHCWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | 25 | < 10 | 55 | < 10 |
| TPHCWG - Aromatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | NONE | < 10 | 95 | 26 | 75 | < 10 |
| **VOCs** | | | | | | | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Benzene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Toluene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | 6.1 |
| Ethylbenzene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| p & m-Xylene | µg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| o-Xylene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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**Analytical Report Number: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448806 | 448807 | 448808 | 448809 | 448810 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP103 | TP104 | TP105 | HP107 | TP109 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | N/A | N/A | N/A | N/A | N/A |
| **Depth (m)** | | | | 1.20-1.30 | 0.20-0.30 | 3.10-3.20 | 0.10-0.15 | 0.20-0.30 |
| **Date Sampled** | | | | 04/02/2025 | 04/02/2025 | 04/02/2025 | 05/02/2025 | 05/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | 23.7 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 13 | 20 | 20 | 24 | 23 |
| Total mass of sample received | kg | 0.1 | NONE | 0.6 | 1.1 | 0.2 | 0.6 | 0.6 |
| **Asbestos** | | | | | | | | |
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected | - | - | - | - |
| Asbestos Analyst ID | N/A | N/A | N/A | KMC | - | - | - | - |
| **General Inorganics** | | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | 8.3 | - | 8.2 | - | - |
| Total Sulphate as $SO_4$ | % | 0.005 | MCERTS | 0.028 | - | 0.039 | - | - |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 75 | - | 12 | - | - |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 37.5 | - | 6.16 | - | - |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | 3.3 | - | - | - | - |
| Total Sulphur | mg/kg | 50 | MCERTS | 230 | - | 130 | - | - |
| Total Sulphur | % | 0.005 | MCERTS | 0.023 | - | 0.013 | - | - |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | - | 2.4 | 0.4 | 2 | - |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | < 2.0 | - | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | < 2.0 | - | - | - | - |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 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 | < 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 | 0.29 | < 0.05 | < 0.05 | 0.09 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 0.54 | 0.09 | < 0.05 | 0.17 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | 0.43 | 0.06 | < 0.05 | 0.12 | < 0.05 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 0.22 | < 0.05 | < 0.05 | 0.09 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | 0.2 | 0.06 | < 0.05 | 0.07 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.32 | < 0.05 | < 0.05 | 0.14 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.15 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 0.23 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 0.1 | < 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 | 0.11 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 2.59 | < 0.80 | < 0.80 | < 0.80 | < 0.80 |

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The results included within the report relate only to the sample(s) submitted for testing.

**Analytical Report Number: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448806 | 448807 | 448808 | 448809 | 448810 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP103 | TP104 | TP105 | HP107 | TP109 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | N/A | N/A | N/A | N/A | N/A |
| **Depth (m)** | | | | 1.20-1.30 | 0.20-0.30 | 3.10-3.20 | 0.10-0.15 | 0.20-0.30 |
| **Date Sampled** | | | | 04/02/2025 | 04/02/2025 | 04/02/2025 | 05/02/2025 | 05/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 6.1 | 7.6 | 4.5 | 7.3 | 9 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | 0.3 | 0.3 | 0.4 | 0.3 | 0.4 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | < 1.8 | < 1.8 | < 1.8 | < 1.8 | < 1.8 |
| Chromium (III) | mg/kg | 1 | NONE | 22 | 25 | 13 | 26 | 29 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 22 | 26 | 13 | 26 | 30 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 18 | 18 | 5.6 | 18 | 15 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 38 | 25 | 6.3 | 290 | 21 |
| 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 | 15 | 13 | 12 | 16 | 18 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 74 | 52 | 29 | 54 | 53 |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | < 2.5 | - | - | - | - |
| Magnesium (water soluble) | mg/kg | 5 | NONE | < 5.0 | - | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPHCWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPHCWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPHCWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPHCWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPHCWG - Aliphatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPHCWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.02 | MCERTS | < 0.020 | < 0.020 | < 0.020 | < 0.020 | < 0.020 |
| TPHCWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPHCWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPHCWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPHCWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPHCWG - Aromatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| **VOCs** | | | | | | | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Benzene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Toluene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Ethylbenzene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| p & m-Xylene | µg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| o-Xylene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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**Analytical Report Number: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448811 | 448812 | 448813 | 448814 | 448815 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP111 | TP112 | HP101 | HP104 | HP105 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | N/A | N/A | N/A | N/A | N/A |
| **Depth (m)** | | | | 0.50-0.60 | 0.20-0.30 | 0.50-0.60 | 0.50-0.55 | 0.70-0.75 |
| **Date Sampled** | | | | 05/02/2025 | 05/02/2025 | 05/02/2025 | 05/02/2025 | 05/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | 42.7 | < 0.1 | 20 | 26.2 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 11 | 11 | 15 | 23 | 26 |
| Total mass of sample received | kg | 0.1 | NONE | 0.6 | 0.6 | 0.8 | 0.6 | 0.6 |
| **Asbestos** | | | | | | | | |
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected | - | Not-detected | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | KMC | - | KJK | KJK | KJK |
| **General Inorganics** | | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | 8.2 | - | - | - | - |
| Total Sulphate as $SO_4$ | % | 0.005 | MCERTS | 0.019 | - | - | - | - |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 10 | - | - | - | - |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 5.14 | - | - | - | - |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | 1 | - | - | - | - |
| Total Sulphur | mg/kg | 50 | MCERTS | 120 | - | - | - | - |
| Total Sulphur | % | 0.005 | MCERTS | 0.012 | - | - | - | - |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | - | 2 | - | - | 4.5 |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | < 2.0 | - | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | < 2.0 | - | - | - | - |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 0.09 | 0.06 | 0.16 | 0.11 | 0.26 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | 0.07 | 0.11 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.17 | < 0.05 | 0.07 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.19 | 0.06 | 0.06 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.91 | 0.9 | 1.1 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.28 | < 0.05 | 0.26 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.06 | 1.2 | 0.99 | 2.6 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.05 | 0.95 | 0.76 | 2.3 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.54 | 0.25 | 1.5 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.52 | 0.49 | 1.5 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | < 0.05 | < 0.05 | 0.63 | 0.53 | 1.6 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | < 0.05 | < 0.05 | 0.27 | 0.2 | 0.54 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.06 | 0.55 | 0.36 | 1.1 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.27 | 0.19 | 0.44 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | 0.15 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.3 | 0.18 | 0.47 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | < 0.80 | < 0.80 | 6.9 | 5.08 | 13.9 |

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**Analytical Report Number: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448811 | 448812 | 448813 | 448814 | 448815 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | TP111 | TP112 | HP101 | HP104 | HP105 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Water Matrix | | | | N/A | N/A | N/A | N/A | N/A |
| Depth (m) | | | | 0.50-0.60 | 0.20-0.30 | 0.50-0.60 | 0.50-0.55 | 0.70-0.75 |
| Date Sampled | | | | 05/02/2025 | 05/02/2025 | 05/02/2025 | 05/02/2025 | 05/02/2025 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 4.8 | 8.2 | 7.5 | 9.2 | 20 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | 0.3 | 0.3 | 0.6 | 3.9 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | < 1.8 | < 1.8 | < 1.8 | < 1.8 | < 1.8 |
| Chromium (III) | mg/kg | 1 | NONE | 24 | 18 | 21 | 21 | 17 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 24 | 19 | 22 | 23 | 17 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 9.4 | 15 | 43 | 58 | 170 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 10 | 24 | 120 | 110 | 520 |
| 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 | 12 | 18 | 17 | 49 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 40 | 75 | 99 | 300 | 76 |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | < 2.5 | - | - | - | - |
| Magnesium (water soluble) | mg/kg | 5 | NONE | < 5.0 | - | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPHCWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 4.5 |
| TPHCWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | 13 |
| TPHCWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | 14 |
| TPHCWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPHCWG - Aliphatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | 32 |
| TPHCWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| TPHCWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | < 0.010 | < 0.010 | < 0.010 | < 0.010 | 0.031 |
| TPHCWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.02 | MCERTS | < 0.020 | < 0.020 | < 0.020 | < 0.020 | < 0.020 |
| TPHCWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPHCWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPHCWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPHCWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPHCWG - Aromatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| **VOCs** | | | | | | | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Benzene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Toluene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | 7.7 | < 5.0 | 31 |
| Ethylbenzene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| p & m-Xylene | µg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| o-Xylene | µg/kg | 5 | MCERTS | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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The results included within the report relate only to the sample(s) submitted for testing.

**Analytical Report Number: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448816 | 448817 | 448818 | 448819 | 448820 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP105 | TP101 | CP102 | CP104 | TP107 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | N/A | N/A | N/A | N/A | N/A |
| **Depth (m)** | | | | 0.50-0.60 | 0.20-0.30 | 2.00-2.45 | 1.70 | 0.70-0.80 |
| **Date Sampled** | | | | 05/02/2025 | 04/02/2025 | 04/02/2025 | 04/02/2025 | 04/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | 65 | 45.5 | 70.3 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 4.4 | 5.8 | 8 | 8.9 | 16 |
| Total mass of sample received | kg | 0.1 | NONE | 0.5 | 0.5 | 0.8 | 1 | 0.5 |
| **Asbestos** | | | | | | | | |
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | - | - | - | - | - |
| Asbestos Analyst ID | N/A | N/A | N/A | - | - | - | - | - |
| **General Inorganics** | | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | 7.8 | 9.8 | 8.3 | 8.2 | 7.9 |
| Total Sulphate as $SO_4$ | % | 0.005 | MCERTS | - | 0.104 | - | - | - |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 12 | 400 | 77 | 46 | 11 |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 6.2 | 199 | 38.6 | 23.1 | 5.4 |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | 10 | - | - | - |
| Total Sulphur | mg/kg | 50 | MCERTS | - | 470 | - | - | - |
| Total Sulphur | % | 0.005 | MCERTS | - | 0.047 | - | - | - |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | - | - | - | - | - |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | - | < 2.0 | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | < 2.0 | - | - | - |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Acenaphthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluorene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Phenanthrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Chrysene | mg/kg | 0.05 | MCERTS | - | - | - | - | - |
| Benzo(b)fluoranthene | mg/kg | 0.05 | 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 | - | - | - | - | - |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | - | - | - | - | - |

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**Analytical Report Number: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448816 | 448817 | 448818 | 448819 | 448820 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP105 | TP101 | CP102 | CP104 | TP107 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | N/A | N/A | N/A | N/A | N/A |
| **Depth (m)** | | | | 0.50-0.60 | 0.20-0.30 | 2.00-2.45 | 1.70 | 0.70-0.80 |
| **Date Sampled** | | | | 05/02/2025 | 04/02/2025 | 04/02/2025 | 04/02/2025 | 04/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | - | - | - | - | - |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | - | - | - | - | - |
| Chromium (III) | mg/kg | 1 | NONE | - | - | - | - | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | - | - | - | - | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - | - |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | 3 | - | - | - |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | 6 | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPHCWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | - | - | - | - | - |
| TPHCWG - Aliphatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | NONE | - | - | - | - | - |
| TPHCWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.02 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | - | - | - | - |
| TPHCWG - Aromatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | NONE | - | - | - | - | - |
| **VOCs** | | | | | | | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | MCERTS | - | - | - | - | - |
| Benzene | µg/kg | 5 | MCERTS | - | - | - | - | - |
| Toluene | µg/kg | 5 | MCERTS | - | - | - | - | - |
| Ethylbenzene | µg/kg | 5 | MCERTS | - | - | - | - | - |
| p & m-Xylene | µg/kg | 8 | MCERTS | - | - | - | - | - |
| o-Xylene | µg/kg | 5 | MCERTS | - | - | - | - | - |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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**Analytical Report Number: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448821 | 448822 | 448823 | 448824 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CP101 | CP102 | CP103 | CP104 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | N/A | N/A | N/A | N/A |
| **Depth (m)** | | | | 5.00 | 8.00 | 6.00 | 10.00 |
| **Date Sampled** | | | | 03/02/2025 | 03/02/2025 | 04/02/2025 | 04/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 21 | 23 | 22 | 22 |
| Total mass of sample received | kg | 0.1 | NONE | 1 | 1 | 1 | 1 |
| **Asbestos** | | | | | | | |
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | - | - | - | - |
| Asbestos Analyst ID | N/A | N/A | N/A | - | - | - | - |
| **General Inorganics** | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | - | 8.3 | 8 | - |
| Total Sulphate as $SO_4$ | % | 0.005 | MCERTS | - | 0.044 | 0.055 | - |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | - | 420 | 600 | - |
| Water Soluble $SO_4$ 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | - | 212 | 302 | - |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | - | - | - | - |
| Total Sulphur | mg/kg | 50 | MCERTS | - | 3400 | 7300 | - |
| Total Sulphur | % | 0.005 | MCERTS | - | 0.335 | 0.729 | - |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | 0.2 | 1 | 0.9 | 0.6 |
| Water Soluble Nitrate (2:1) as N | mg/kg | 2 | NONE | - | - | - | - |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | - | - | - | - |
| **Speciated PAHs** | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Acenaphthene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Fluorene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Phenanthrene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Fluoranthene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Pyrene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Chrysene | mg/kg | 0.05 | MCERTS | - | - | - | - |
| Benzo(b)fluoranthene | mg/kg | 0.05 | 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 | - | - | - | - |
| **Total PAH** | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | - | - | - | - |

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**Analytical Report Number: 25-006220**
**Project / Site name: Southampton**
**Your Order No: 3569**

| Lab Sample Number | | | | 448821 | 448822 | 448823 | 448824 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CP101 | CP102 | CP103 | CP104 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | N/A | N/A | N/A | N/A |
| **Depth (m)** | | | | 5.00 | 8.00 | 6.00 | 10.00 |
| **Date Sampled** | | | | 03/02/2025 | 03/02/2025 | 04/02/2025 | 04/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | |
| **Heavy Metals / Metalloids** | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | - | - | - | - |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | - | - | - | - |
| Chromium (III) | mg/kg | 1 | NONE | - | - | - | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | - | - | - | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | - | - | - | - |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | - | - | - | - |
| Magnesium (water soluble) | mg/kg | 5 | NONE | - | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | |
| TPHCWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | - | - | - | - |
| TPHCWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | - | - | - | - |
| TPHCWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.01 | MCERTS | - | - | - | - |
| TPHCWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | - | - | - | - |
| TPHCWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | - | - | - | - |
| TPHCWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | - | - | - | - |
| TPHCWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | - | - | - | - |
| TPHCWG - Aliphatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | NONE | - | - | - | - |
| TPHCWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | - | - | - | - |
| TPHCWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.01 | MCERTS | - | - | - | - |
| TPHCWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.02 | MCERTS | - | - | - | - |
| TPHCWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | - | - | - | - |
| TPHCWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | - | - | - | - |
| TPHCWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | - | - | - |
| TPHCWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | - | - | - |
| TPHCWG - Aromatic >EC5 - EC35 $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | NONE | - | - | - | - |
| **VOCs** | | | | | | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | MCERTS | - | - | - | - |
| Benzene | µg/kg | 5 | MCERTS | - | - | - | - |
| Toluene | µg/kg | 5 | MCERTS | - | - | - | - |
| Ethylbenzene | µg/kg | 5 | MCERTS | - | - | - | - |
| p & m-Xylene | µg/kg | 8 | MCERTS | - | - | - | - |
| o-Xylene | µg/kg | 5 | MCERTS | - | - | - | - |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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**Analytical Report Number : 25-006220**
**Project / Site name: Southampton**

* 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 * |
|---|---|---|---|---|
| 448801 | CP101 | None Supplied | 0.50-0.60 | Brown clay and loam with gravel |
| 448802 | CP103 | None Supplied | 3.00-3.20 | Brown clay and sand with stones |
| 448803 | CP103 | None Supplied | 4.20-4.30 | Brown clay and sand |
| 448804 | TP101 | None Supplied | 0.20-0.30 | Brown sandy gravel with stones *g |
| 448805 | TP102 | None Supplied | 0.50-0.60 | Brown clay and sand with gravel |
| 448806 | TP103 | None Supplied | 1.20-1.30 | Brown clay and sand with stones |
| 448807 | TP104 | None Supplied | 0.20-0.30 | Brown clay and loam with gravel and vegetation |
| 448808 | TP105 | None Supplied | 3.10-3.20 | Light brown clay |
| 448809 | HP107 | None Supplied | 0.10-0.15 | Brown clay and loam with gravel and vegetation |
| 448810 | TP109 | None Supplied | 0.20-0.30 | Brown clay and loam with gravel and vegetation |
| 448811 | TP111 | None Supplied | 0.50-0.60 | Brown clay and sand with gravel and stones |
| 448812 | TP112 | None Supplied | 0.20-0.30 | Brown loam and clay with gravel and vegetation |
| 448813 | HP101 | None Supplied | 0.50-0.60 | Brown clay and sand with stones |
| 448814 | HP104 | None Supplied | 0.50-0.55 | Brown clay and sand with vegetation and stones |
| 448815 | HP105 | None Supplied | 0.70-0.75 | Brown sand with gravel |
| 448816 | TP105 | None Supplied | 0.50-0.60 | Brown clay and sand with gravel and vegetation |
| 448817 | TP101 | None Supplied | 0.20-0.30 | Brown loam and sand with stones |
| 448818 | CP102 | None Supplied | 2.00-2.45 | Brown clay and sand with stones |
| 448819 | CP104 | None Supplied | 1.7 | Brown clay and sand with stones |
| 448820 | TP107 | None Supplied | 0.70-0.80 | Brown clay and sand with gravel |
| 448821 | CP101 | None Supplied | 5 | Brown clay and sand |
| 448822 | CP102 | None Supplied | 8 | Brown clay and sand |
| 448823 | CP103 | None Supplied | 6 | Brown clay and sand |
| 448824 | CP104 | None Supplied | 10 | Brown clay and sand |

**Analytical Report Number : 25-006220**
**Project / Site name: Southampton**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)**
**Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| 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 dispersion staining techniques | In-house method based on HSG 248, 2021 | A001B | D | ISO 17025 |
| Total organic carbon (Automated) in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method) | In-house method | L009B | D | MCERTS |
| 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 |
| 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 | L038B | D | MCERTS |
| Magnesium, water soluble, in soil | Determination of water soluble magnesium by extraction with water followed by ICP-OES | In-house method based on TRL 447 | L038B | D | NONE |
| Total sulphate (as SO4 in soil) | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES | In-house method | L038B | D | MCERTS |
| Sulphate, water soluble, in soil (16hr extraction) | Sulphate, water soluble, in soil (16hr extraction) | In-house method | L038B | 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 | L038B | D | MCERTS |
| Speciated 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 | MCERTS |
| BTEX and/or Volatile organic compounds in soil | Determination of volatile organic compounds in soil by headspace GC-MS | In-house method based on USEPA 8260 | L073B | W | MCERTS |
| Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil | Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic | In-house method | L076B/L088-PL | D/W | MCERTS |
| Water Soluble Nitrate (2:1) as N in soil | Determination of nitrate by reaction with sodium salicylate and colorimetry | In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction | L078-PL | W | NONE |
| Chromium III in soil | In-house method by calculation from total Cr and Cr VI | In-house method by calculation | L080-PL/L130B | W | NONE |
| 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 |
| Chloride, water soluble, in soil | Determination of Chloride colorimetrically by discrete analyser | In-house method | L082B | D | MCERTS |

**Analytical Report Number : 25-006220**
**Project / Site name: Southampton**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)**
**Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| 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 |

**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.**

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

*g - Unaccredited sample matrix.

# Appendix E – Chemical Groundwater Results

UKAS TESTING
4041

Environmental Science

GEO2 Remediation Ltd
Coniston House
Louisa Street
Idle
BD10 8NE

**e:** Megan.OKelly@geo2.co.uk
jessica.rowe@geo2.co.uk

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

**t:** 01923 225404
**f:** 01923 237404
**e:** reception@i2analytical.com

# Analytical Report Number : 25-009438

| | | | |
|---|---|---|---|
| **Project / Site name:** | Southampton | **Samples received on:** | 26/02/2025 |
| **Your job number:** | 4362 | **Samples instructed on/ Analysis started on:** | 26/02/2025 |
| **Your order number:** | 3642 | **Analysis completed by:** | 04/03/2025 |
| **Report Issue Number:** | 1 | **Report issued on:** | 04/03/2025 |
| **Samples Analysed:** | 4 water 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 |
| air | - once the analysis is complete |

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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: 25-009438**
**Project / Site name: Southampton**

**Your Order No: 3642**

| **Lab Sample Number** | | | | 464739 | 464740 | 464741 | 464742 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CP101 | CP102 | CP103 | CP104 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | Ground water | Ground water | Ground water | Ground water |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 25/02/2025 | 25/02/2025 | 25/02/2025 | 25/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Water Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | |
| **General Inorganics** | | | | | | | |
| pH (L099) | pH Units | N/A | ISO 17025 | 7 | 7.1 | 6.9 | 6.9 |
| Sulphate as $SO_4$ | mg/l | 0.045 | ISO 17025 | 22.3 | 35.8 | 32 | 0.95 |
| **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 | 0.38 |
| Acenaphthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | 1.1 | 2.3 |
| Fluorene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | 0.97 | 3.8 |
| Phenanthrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | 2.1 |
| Anthracene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Fluoranthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Pyrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(a)anthracene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Chrysene | µg/l | 0.01 | ISO 17025 | < 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 |
| Benzo(k)fluoranthene | µg/l | 0.01 | ISO 17025 | < 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 |
| Indeno(1,2,3-cd)pyrene | µg/l | 0.01 | ISO 17025 | < 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 |
| Benzo(ghi)perylene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| **Heavy Metals / Metalloids** | | | | | | | |
| Arsenic (dissolved) | µg/l | 0.15 | ISO 17025 | 0.62 | 0.77 | 1.46 | 3.91 |
| Cadmium (dissolved) | µg/l | 0.02 | ISO 17025 | 0.04 | 0.06 | 0.02 | < 0.02 |
| Chromium (dissolved) | µg/l | 0.2 | ISO 17025 | 0.4 | 0.2 | < 0.2 | < 0.2 |
| Copper (dissolved) | µg/l | 0.5 | ISO 17025 | 2.4 | 1.4 | 1.9 | < 0.5 |
| Lead (dissolved) | µg/l | 0.2 | ISO 17025 | 0.5 | 0.3 | < 0.2 | < 0.2 |
| Mercury (dissolved) | µg/l | 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Nickel (dissolved) | µg/l | 0.5 | ISO 17025 | 2.4 | 12 | 8.4 | 1 |
| Zinc (dissolved) | µg/l | 0.5 | ISO 17025 | 7.2 | 2.5 | 6 | 1.1 |
| Chromium (hexavalent) | µg/l | 5 | ISO 17025 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Chromium (III) | µg/l | 5 | NONE | < 5.0 | < 5.0 | < 5.0 | < 5.0 |

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**Analytical Report Number: 25-009438**
**Project / Site name: Southampton**

**Your Order No: 3642**

| **Lab Sample Number** | | | | 464739 | 464740 | 464741 | 464742 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CP101 | CP102 | CP103 | CP104 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | Ground water | Ground water | Ground water | Ground water |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 25/02/2025 | 25/02/2025 | 25/02/2025 | 25/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Water Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | |
| **Petroleum Hydrocarbons** | | | | | | | |
| TPH - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | µg/l | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | µg/l | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | µg/l | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH - Aliphatic >EC10 - EC12 $_{EH\_1D\_AL\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | 100 | < 10 |
| TPH - Aliphatic >EC12 - EC16 $_{EH\_1D\_AL\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | 1600 | < 10 |
| TPH - Aliphatic >EC16 - EC21 $_{EH\_1D\_AL\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | 1900 | < 10 |
| TPH - Aliphatic >EC21 - EC35 $_{EH\_1D\_AL\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | 2400 | < 10 |
| TPH - Aliphatic >EC5 - EC35 $_{HS+EH\_1D\_AL\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | 6000 | < 10 |
| 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 $_{EH\_1D\_AR\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | 120 | 110 |
| TPH - Aromatic >EC12 - EC16 $_{EH\_1D\_AR\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | 700 | 290 |
| TPH - Aromatic >EC16 - EC21 $_{EH\_1D\_AR\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | 1000 | 280 |
| TPH - Aromatic >EC21 - EC35 $_{EH\_1D\_AR\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | < 10 | 90 |
| TPH - Aromatic >EC5 - EC35 $_{HS+EH\_1D\_AR\_MS}$ | µg/l | 10 | NONE | < 10 | < 10 | 1900 | 760 |
| **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 | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 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 | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 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 |

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**Analytical Report Number: 25-009438**
**Project / Site name: Southampton**

**Your Order No: 3642**

| **Lab Sample Number** | | | | 464739 | 464740 | 464741 | 464742 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CP101 | CP102 | CP103 | CP104 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | Ground water | Ground water | Ground water | Ground water |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 25/02/2025 | 25/02/2025 | 25/02/2025 | 25/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Water Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | |
| 1,1,1,2-Tetrachloroethane | µg/l | 3 | ISO 17025 | < 3.0 | < 3.0 | < 3.0 | < 3.0 |
| Ethylbenzene | µg/l | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/l | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 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 | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 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 |
| 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 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 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 |

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**Analytical Report Number: 25-009438**
**Project / Site name: Southampton**

**Your Order No: 3642**

| **Lab Sample Number** | | | | 464739 | 464740 | 464741 | 464742 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | CP101 | CP102 | CP103 | CP104 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Water Matrix** | | | | Ground water | Ground water | Ground water | Ground water |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 25/02/2025 | 25/02/2025 | 25/02/2025 | 25/02/2025 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Water Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | | | | |
| 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 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 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 |
| Hexachlorobenzene | µg/l | 0.05 | NONE | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 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 : 25-009438**
**Project / Site name: Southampton**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI 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, PW, GW, 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 |
| Total Petroleum Hydrocarbons with carbon banding in water by GC-MS | Determination of total petroleum hydrocarbons in water by GC-MS with carbon banding aliphatic and aromatic | In-house method | L070B | 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 |
| Chromium(III) in water | In-house method by calculation from total Cr and Cr(VI) | In-house method by calculation | L080-PL | W | NONE |
| Hexavalent chromium in water | Determination of hexavalent chromium in water by acidification, addition of 1,5-diphenylcarbazide, followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL | In-house method by continuous flow analyser | L080-PL | W | ISO 17025 |
| Total Petroleum Hydrocarbons in water by HS-GC-MS | Determination of total petroleum hydrocarbons in water by headspace GC-MS. Accredited matrices: SW, PW, GW | In-house method | L088-PL | W | ISO 17025 |
| pH of water at 20°C (automated) | Determination of pH of water by electrochemical measurement. Accredited matrices: SW, PW, GW, FSE, LL | In-house method | L099-PL | W | ISO 17025 |
| Speciated PAHs and/or Semi-volatile organic compounds in water | Determination of semi-volatile organic compounds (including PAHs) in water by extraction in dichloromethane followed by GC-MS. Accredited matrices (PAHs): SW, PW, GW | 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 |

**Analytical Report Number : 25-009438**
**Project / Site name: Southampton**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI 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 in water | Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW, DI PrW, FSE, LL | 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.**

## 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 - underscore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total |

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

# Appendix F – Geotechnical Results & SPT Calibration Certificates

# SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

**Southern Testing**
**Unit 11**
**Charlwoods Road**
**East Grinstead**
**West Sussex**
**RH19 2HU**

| | |
|---|---|
| SPT Hammer Ref: | SEDS7 |
| Test Date: | 27/04/2024 |
| Report Date: | 27/04/2024 |
| File Name: | SEDS7.spt |
| Test Operator: | BOB |

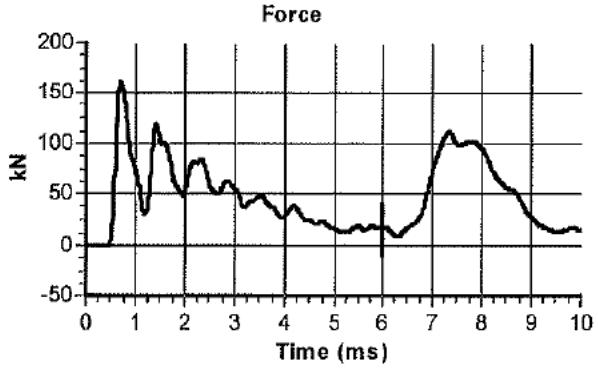
**Instrumented Rod Data**

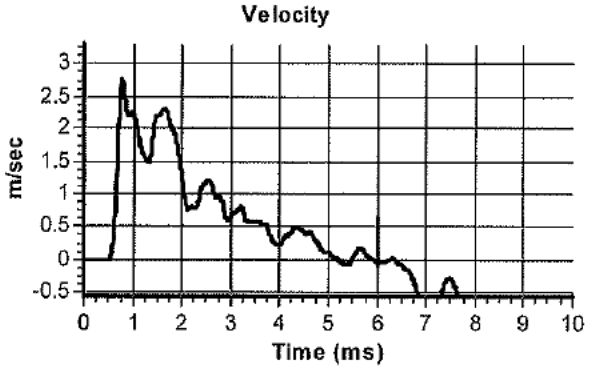
| | |
|---|---|
| Diameter $d_r$ (mm): | 54 |
| Wall Thickness $t_r$ (mm): | 6.6 |
| Assumed Modulus $E_a$ (GPa): | 208 |
| Accelerometer No.1: | 64786 |
| Accelerometer No.2: | 64789 |

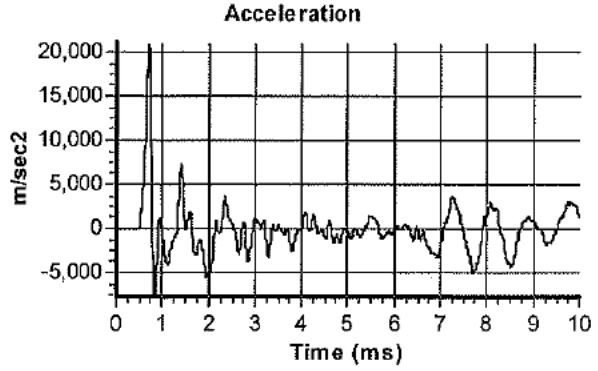
**SPT Hammer Information**

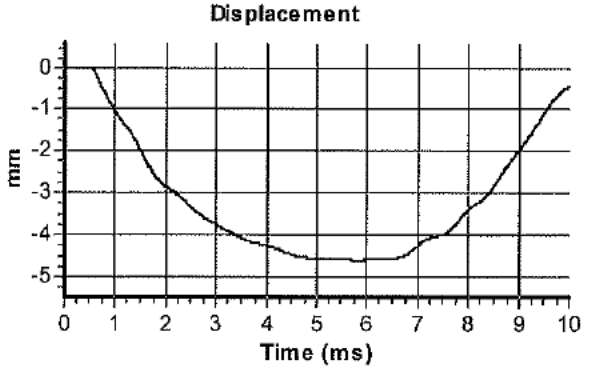
| | |
|---|---|
| Hammer Mass m (kg): | 63.5 |
| Falling Height h (mm): | 760 |
| SPT String Length L (m): | 14.7 |

**Comments / Location**
CHARLSWOOD




**Calculations**

| | |
|---|---|
| Area of Rod A (mm2): | 983 |
| Theoretical Energy $E_{theor}$ (J): | 473 |
| Measured Energy $E_{meas}$ (J): | 348 |

**Energy Ratio $E_r$ (%):** **74**

[redacted]

Signed: Bob Stewart
Title: Technician

The recommended calibration interval is 12 months

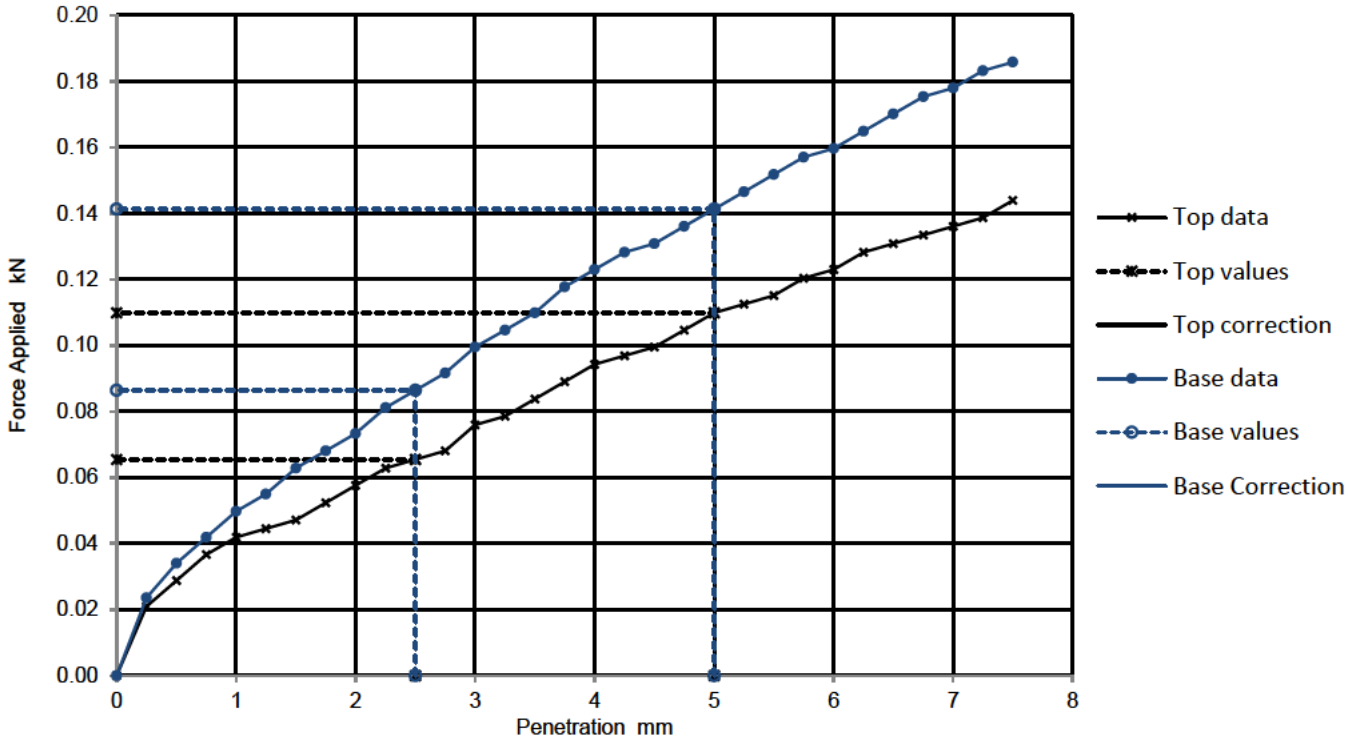
*SPTMAN ver.1.92 All rights reserved, Testconsult ©2010*

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | CP102 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Brown slightly sandy slightly gravelly CLAY | | | Depth m | 0.40 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP202502145 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 3 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.05 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.74 | Mg/m3 | | 0 kPa |
| | Moisture content | 17.8 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 0.5 | 0.6 | 0.6 | N/A | 18.4 |
| BASE | No | 0.7 | 0.7 | 0.7 | | 17.3 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

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7758

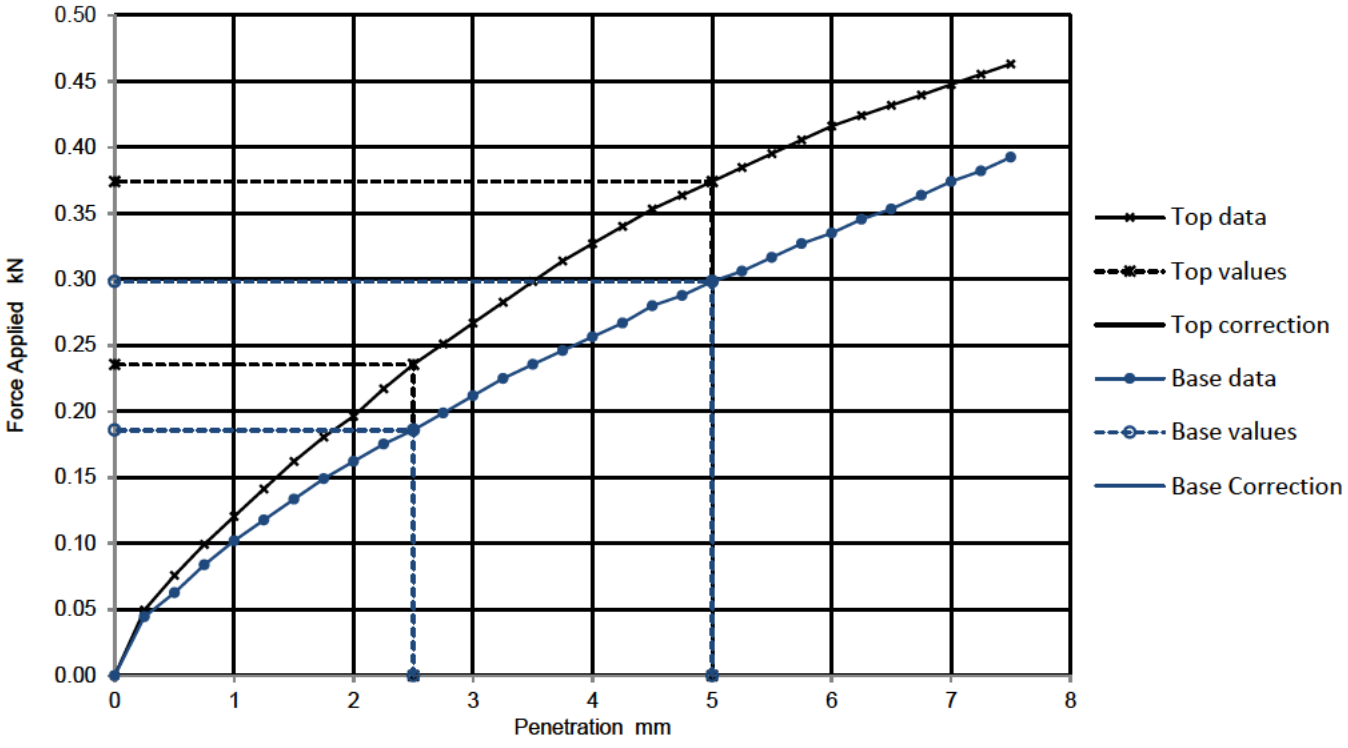
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | California Bearing Ratio ( CBR ) | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | CP103 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Brown slightly sandy CLAY | | | Depth m | 0.30 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP2025021413 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 0 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.00 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.63 | Mg/m3 | | 0 kPa |
| | Moisture content | 22.4 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 1.8 | 1.9 | 1.9 | N/A | 23.1 |
| BASE | No | 1.4 | 1.5 | 1.5 | | 23.0 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

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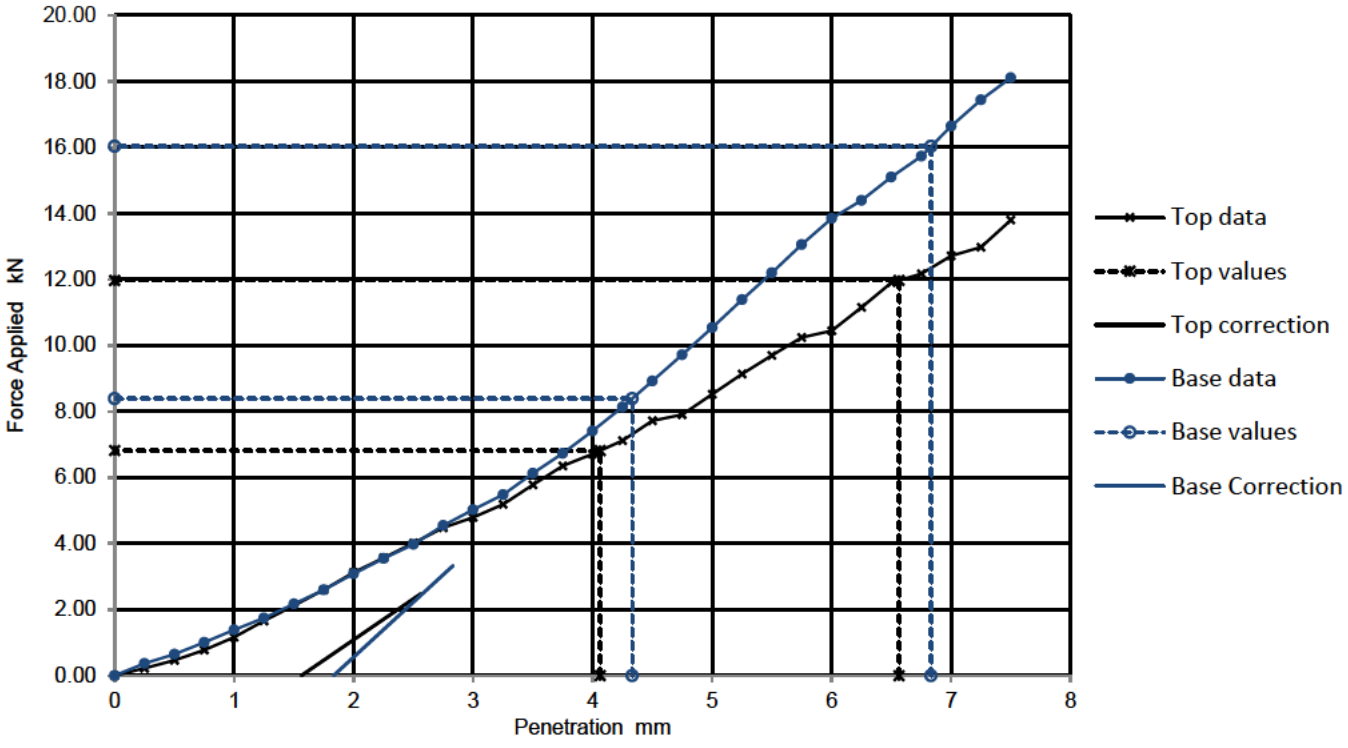
CBR

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | CP103 |
| Project Name | Southampton Airport | | | Sample No. | |
| Soil Description | Light brown slightly sandy gravelly CLAY | | | Depth m | 2.00 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP2025021416 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | | |
|---|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked | |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | | days |
| | | | | Time to surface | | days |
| | | | | Amount of swell recorded | | mm |
| Material retained on 20mm sieve removed | | 31 | % | Dry density after soaking | | Mg/m3 |
| Initial Specimen details | Bulk density | 2.19 | Mg/m3 | Surcharge applied | 0 | kg |
| | Dry density | 2.00 | Mg/m3 | | 0 | kPa |
| | Moisture content | 9.6 | % | | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | Yes | 52.0 | 60.0 | 60.0 | N/A | 9.6 |
| BASE | Yes | 64.0 | 80.0 | 80.0 | | 9.6 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

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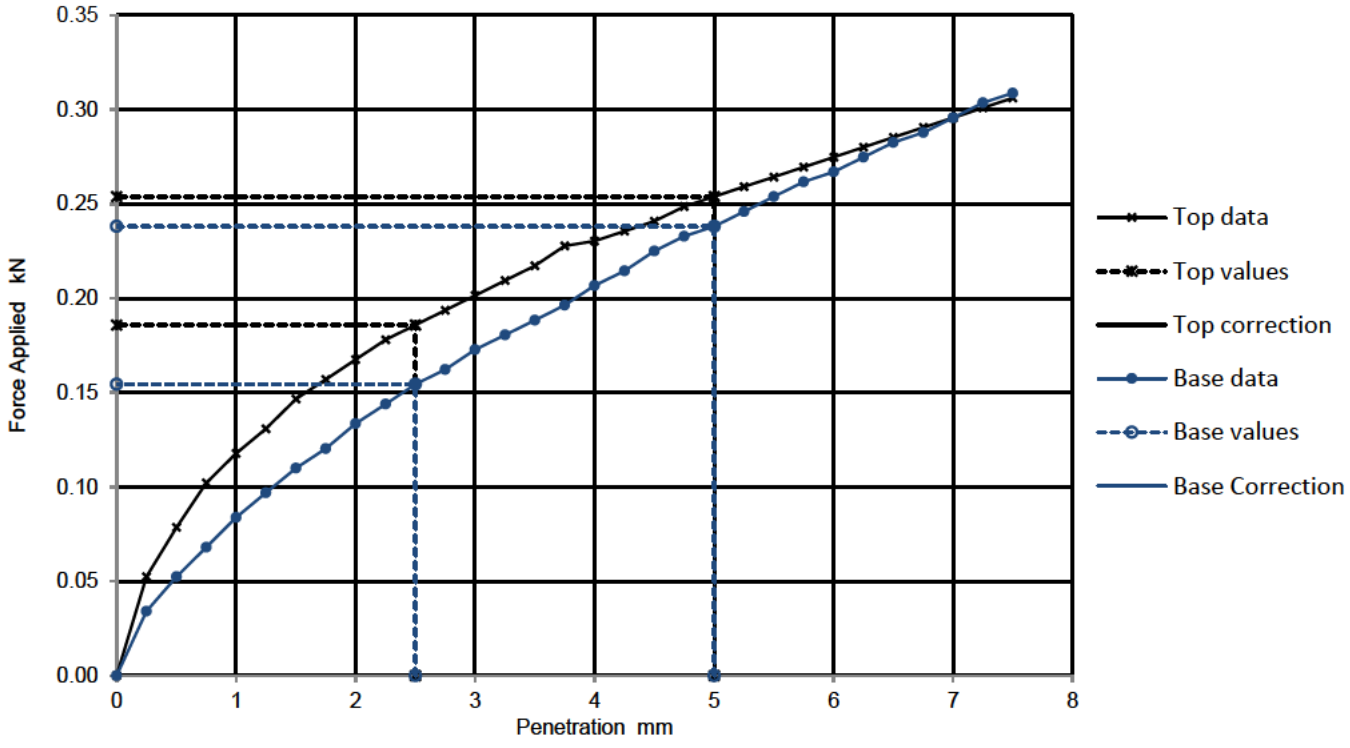
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | CP104 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Brown slightly sandy CLAY | | | Depth m | 0.50 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP2025021414 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 0 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.03 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.67 | Mg/m3 | | 0 kPa |
| | Moisture content | 21.6 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 1.4 | 1.3 | 1.4 | 1.3 | 21.7 |
| BASE | No | 1.2 | 1.2 | 1.2 | | 21.5 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

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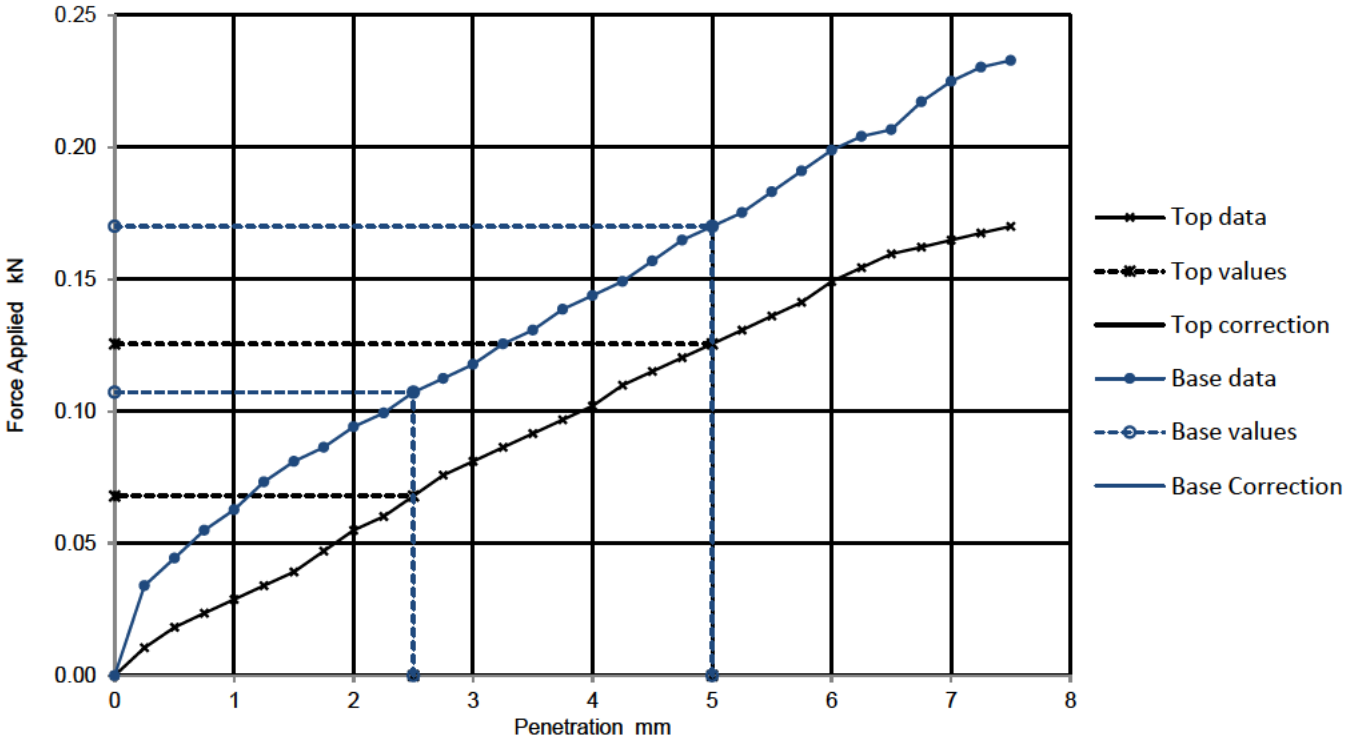
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | CP104 |
| Project Name | Southampton Airport | | | Sample No. | |
| Soil Description | Light brown slightly sandy gravelly CLAY | | | Depth m | 2.00 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP202502149 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | | |
|---|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked | |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | | days |
| | | | | Time to surface | | days |
| | | | | Amount of swell recorded | | mm |
| Material retained on 20mm sieve removed | | 15 | % | Dry density after soaking | | Mg/m3 |
| Initial Specimen details | Bulk density | 2.13 | Mg/m3 | Surcharge applied | 0 | kg |
| | Dry density | 1.86 | Mg/m3 | | 0 | kPa |
| | Moisture content | 14.4 | % | | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 0.5 | 0.6 | 0.6 | N/A | 13.8 |
| BASE | No | 0.8 | 0.9 | 0.9 | | 15.0 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

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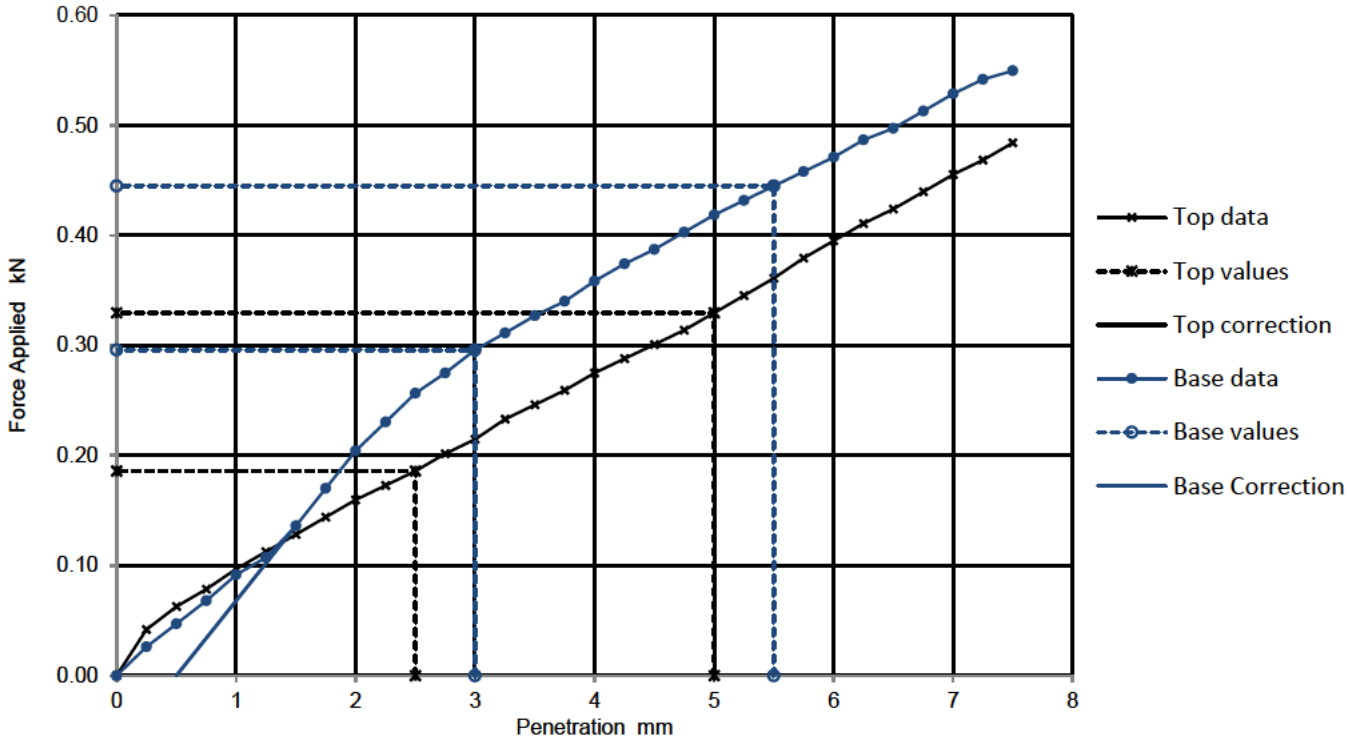
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | HP102 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Brown slightly sandy slightly gravelly CLAY | | | Depth m | 0.50 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP202502146 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 3 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 1.95 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.61 | Mg/m3 | | 0 kPa |
| | Moisture content | 20.8 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 1.4 | 1.6 | 1.6 | N/A | 20.6 |
| BASE | Yes | 2.2 | 2.2 | 2.2 | | 21.0 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

UKAS TESTING 7758

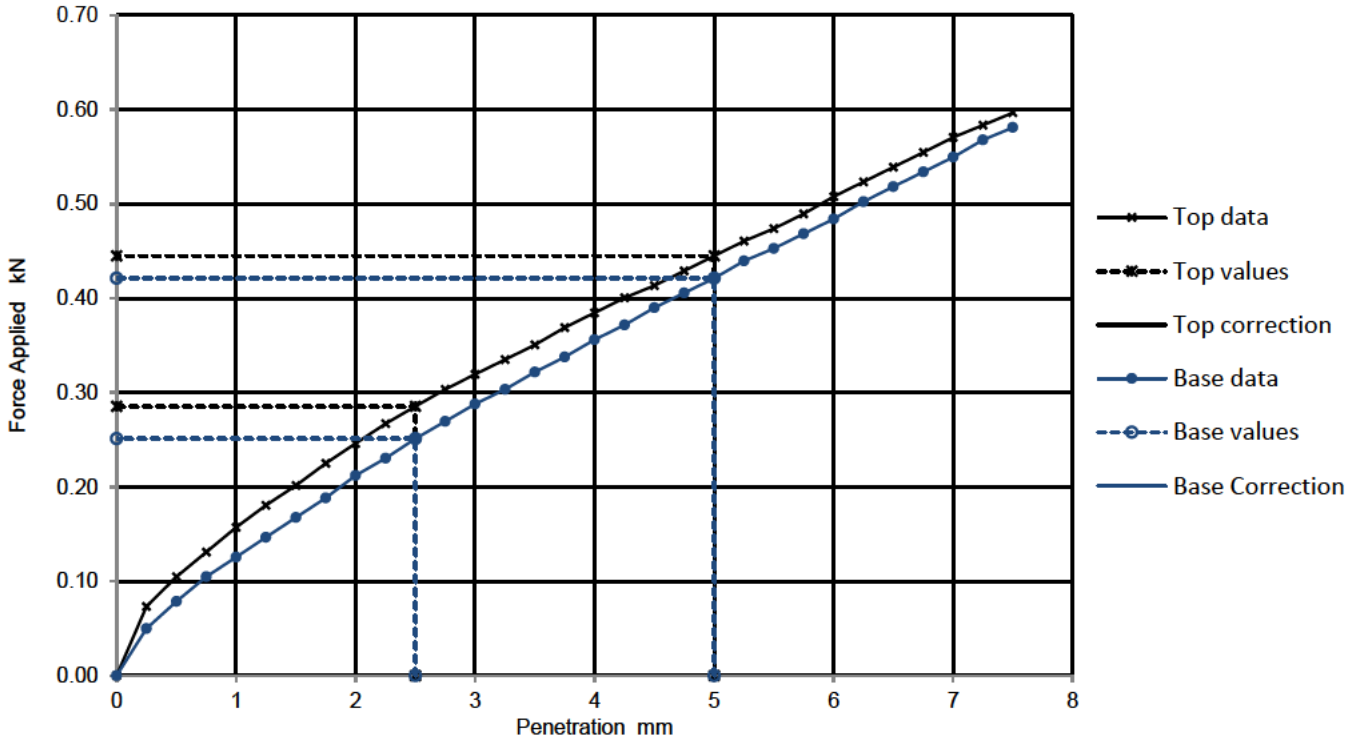
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP101 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Brown slightly gravelly slightly sandy CLAY | | | Depth m | 0.80 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP202502143 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 0 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.05 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.72 | Mg/m3 | | 0 kPa |
| | Moisture content | 19.4 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 2.2 | 2.2 | 2.2 | 2.2 | 19.1 |
| BASE | No | 1.9 | 2.1 | 2.1 | | 19.7 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

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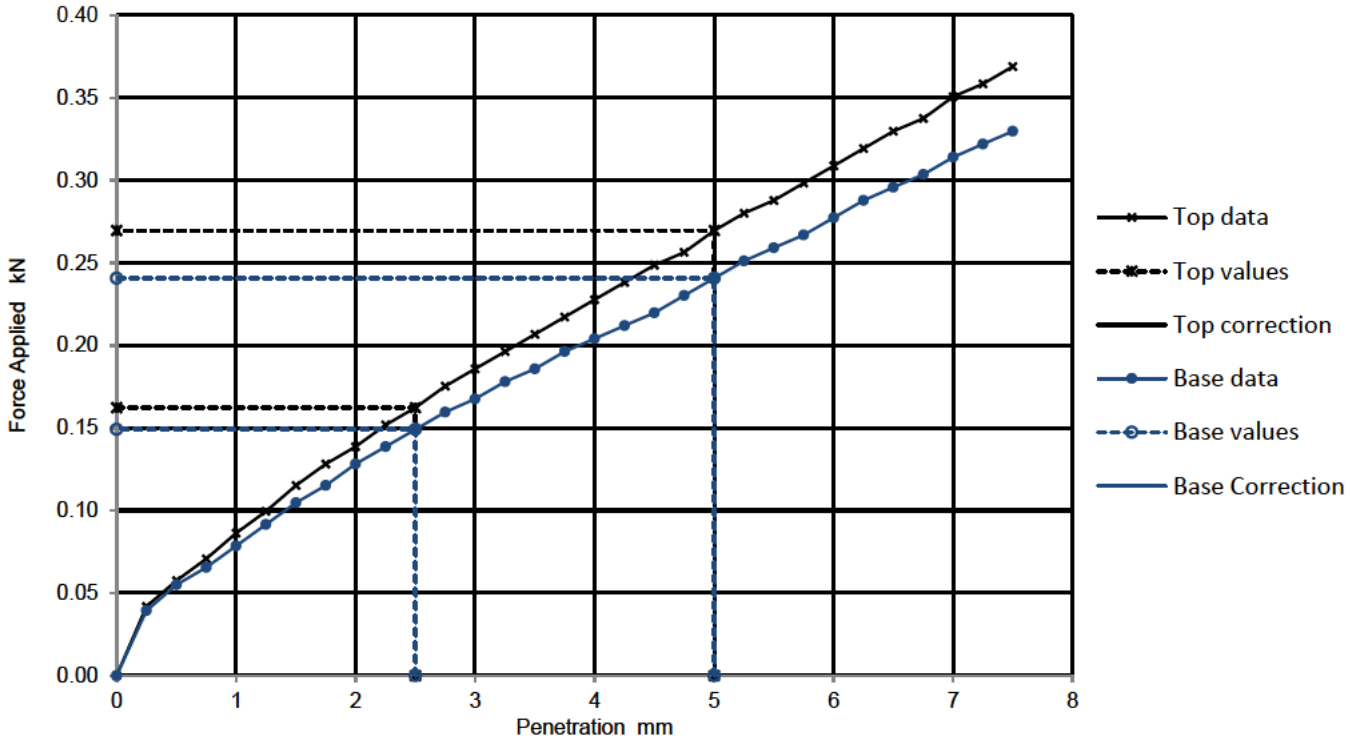
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP102 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Brown slightly sandy slightly gravelly CLAY | | | Depth m | 0.80 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP202502144 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 0 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.01 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.67 | Mg/m3 | | 0 kPa |
| | Moisture content | 20.3 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 1.2 | 1.3 | 1.3 | 1.3 | 20.2 |
| BASE | No | 1.1 | 1.2 | 1.2 | | 20.4 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

7758

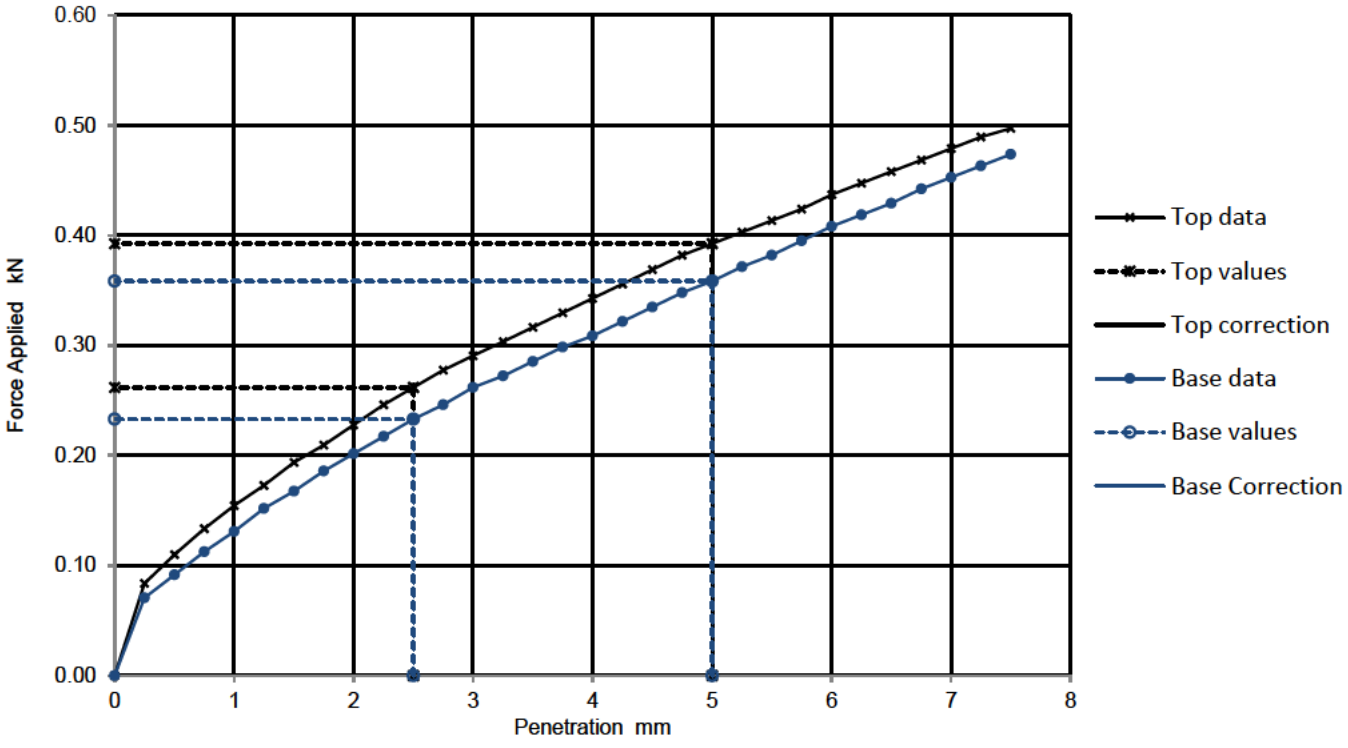
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP104 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Orange brown slightly sandy slightly gravelly CLAY | | | Depth m | 0.60 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP202502147 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 0 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.05 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.72 | Mg/m3 | | 0 kPa |
| | Moisture content | 19.3 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 2.0 | 2.0 | 2.0 | 1.9 | 19.3 |
| BASE | No | 1.8 | 1.8 | 1.8 | | 19.3 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

UKAS TESTING 7758

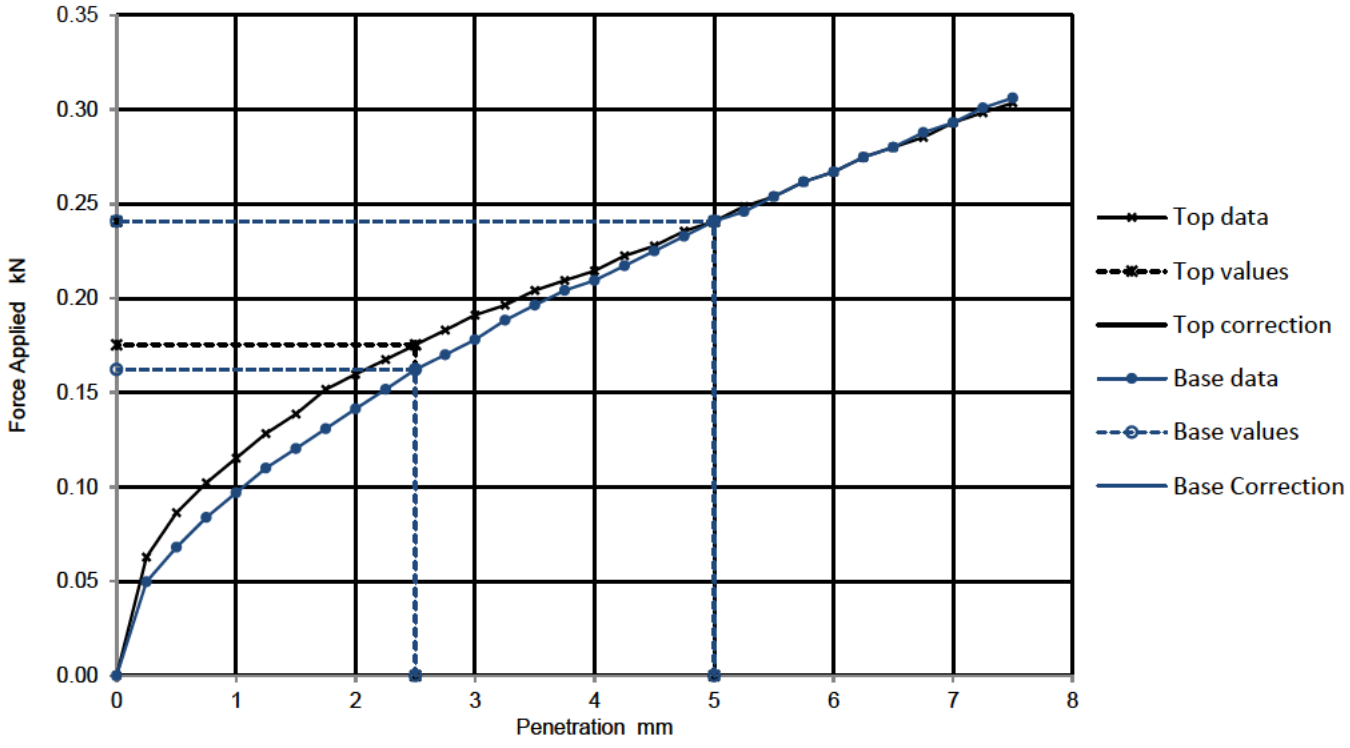
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP105 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Brown slightly gravelly slightly sandy CLAY | | | Depth m | 0.50 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP202502148 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 0 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.01 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.64 | Mg/m3 | | 0 kPa |
| | Moisture content | 22.2 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 1.3 | 1.2 | 1.3 | 1.3 | 22.4 |
| BASE | No | 1.2 | 1.2 | 1.2 | | 22.1 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

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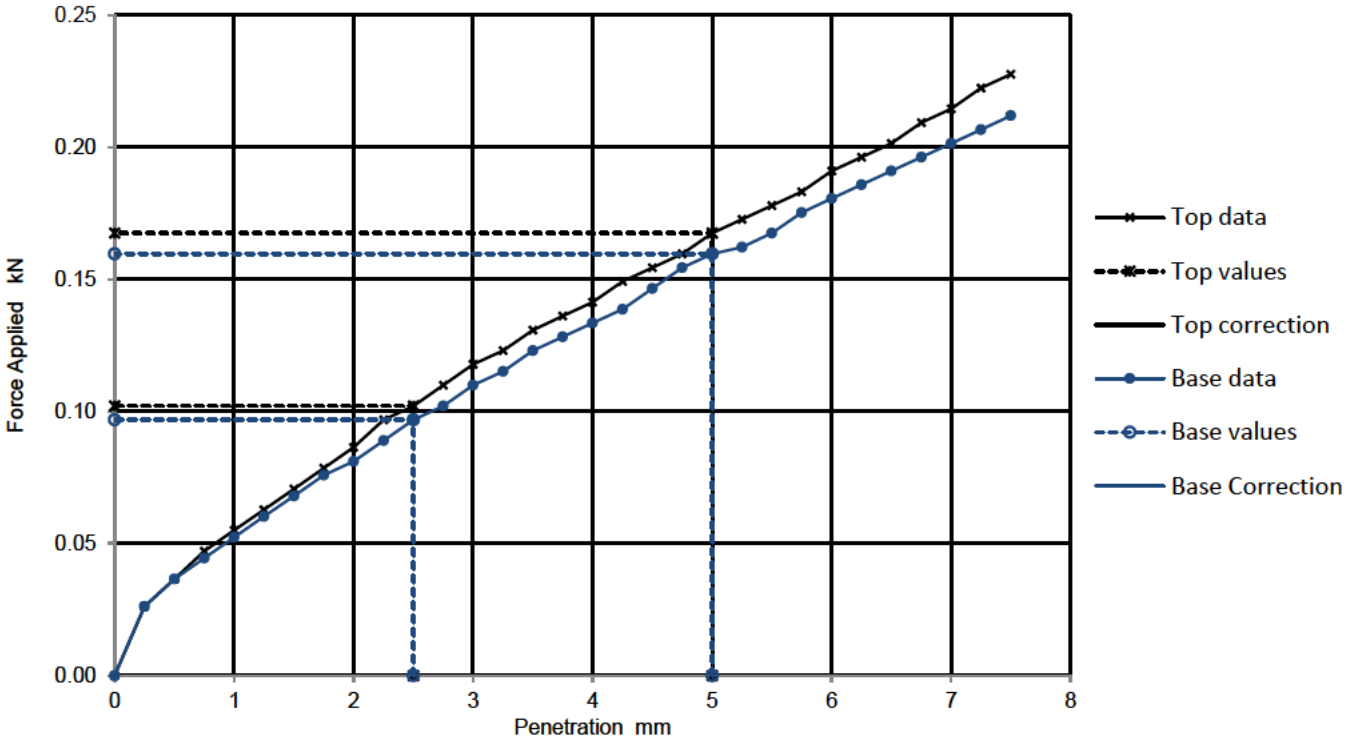
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP107 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Orange brown slightly sandy slightly gravelly CLAY | | | Depth m | 0.60 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP2025021410 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 0 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.02 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.67 | Mg/m3 | | 0 kPa |
| | Moisture content | 21.0 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 0.8 | 0.8 | 0.8 | 0.8 | 20.8 |
| BASE | No | 0.7 | 0.8 | 0.8 | | 21.2 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

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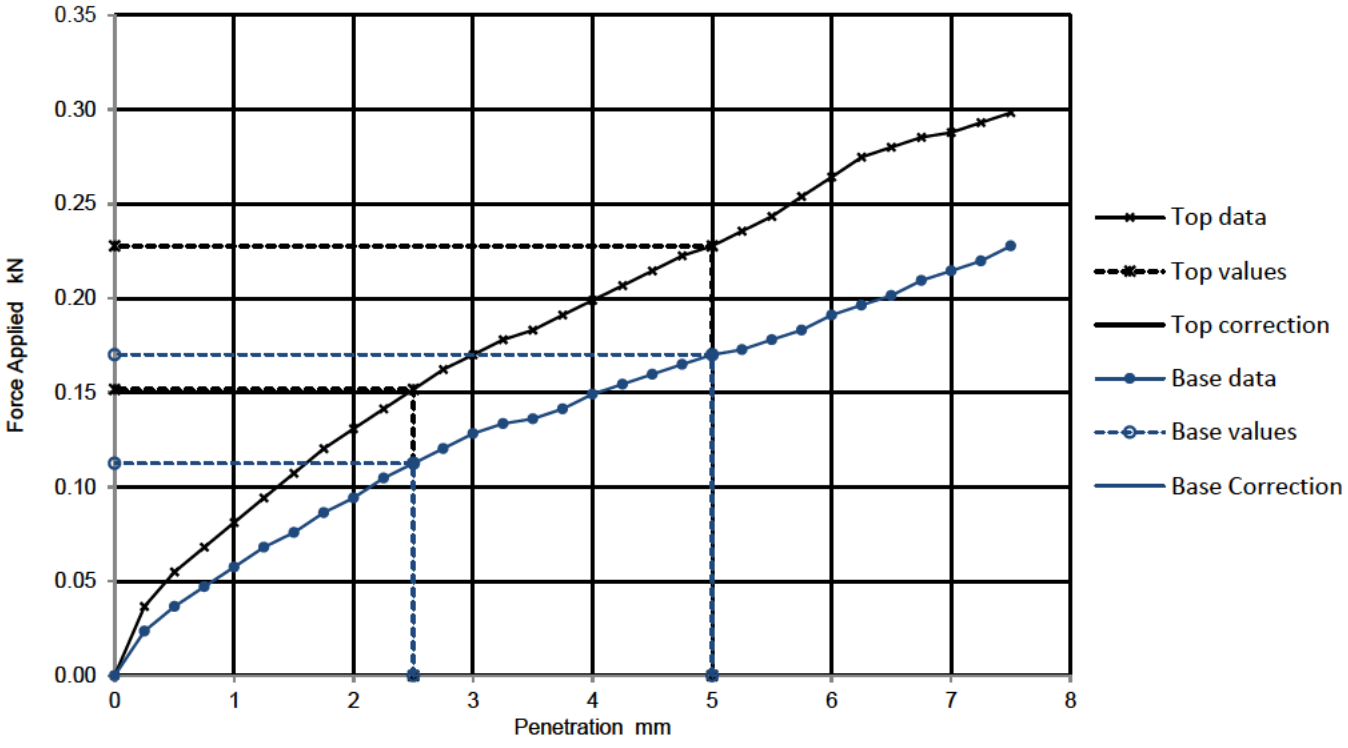
**CBR**

| GQF-008-36<br>Issue 02 - June 24 | **California Bearing Ratio ( CBR )** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP108 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Light brown gravelly CLAY | | | Depth m | 0.80 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Specimen Description | | | | KeyLAB ID | TTLP2025021411 |
| Test Method | BS1377-2: 2022 | | | CBR Test Number | 1 |

**Specimen Preparation**

| | | | | | |
|---|---|---|---|---|---|
| Condition | REMOULDED | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 19 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.00 | Mg/m3 | Surcharge applied | 0 kg |
| | Dry density | 1.67 | Mg/m3 | | 0 kPa |
| | Moisture content | 19.9 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 1.1 | 1.1 | 1.1 | N/A | 20.5 |
| BASE | No | 0.9 | 0.9 | 0.9 | | 19.1 |

Remarks

| Date Printed | 03/03/2025 |
|---|---|

UKAS TESTING
7758

**CBR**

GFQ-008-74
Issue 02 - Nov 23

# Summary of Classification Test Results

Project No.
J301296

Project Name
Southampton Airport

| Hole No. | Sample | | | | Soil Description | Density bulk Mg/m³ | Density dry Mg/m³ | w % | Passing 425µm % | LL % | If 1 Point Test Pen 1 | If 1 Point Test Pen 2 | If 1 Point Test CF | PL % | PI % | Particle density Mg/m³ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top | Base | Type | | | | | | | | | | | | | |
| CP102 | 1 | 3.00 | 3.50 | B | Light brown clayey sandy GRAVEL | | | 7.7 | | | | | | | | | |
| CP102 | | 9.00 | | D | Brown mottled grey slightly sandy silty CLAY | | | 36.9 | 100-n | 65-4pt-i | | | | 24 | 41 | | |
| CP103 | | 4.20 | 4.70 | B | Brown mottled grey slightly sandy silty CLAY | | | 30.6 | | | | | | | | | |
| CP103 | | 5.00 | | D | Brown mottled grey slightly sandy slightly gravelly CLAY | | | 28.2 | 100-n | 68-4pt-i | | | | 25 | 43 | | |
| CP104 | | 4.00 | 4.50 | B | Light brown slightly clayey sandy GRAVEL | | | 6.3 | | | | | | | | | |
| HP106 | 1 | 0.30 | 0.50 | B | Orange brown slightly sandy silty CLAY | | | 19.7 | | | | | | | | | |
| TP101 | 2 | 2.30 | 2.50 | B | Light brown clayey sandy GRAVEL | | | 9.0 | | | | | | | | | |
| TP104 | 1 | 0.60 | 0.80 | B | Orange brown slightly sandy slightly gravelly CLAY | | | 20.1 | 99-hp | 40-4pt-i | | | | 18 | 22 | | |
| TP105 | 3 | 2.80 | 2.90 | B | Orange brown clayey sandy GRAVEL | | | 8.0 | | | | | | | | | |
| TP107 | 1 | 0.60 | 0.80 | B | Orange brown slightly sandy slightly gravelly CLAY | | | 19.0 | 98-hp | 38-4pt-i | | | | 18 | 20 | | |
| TP109 | 2 | 3.30 | 3.40 | B | Grey slightly sandy silty CLAY | | | 29.0 | | | | | | | | | |
| TP111 | 2 | 2.30 | 2.40 | B | Green brown slightly sandy silty CLAY | | | 30.4 | | | | | | | | | |
| TP112 | 1 | 0.90 | 1.10 | B | Brown slightly sandy clayey GRAVEL | | | 10.4 | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
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Key

Density tests:
Linear measurement unless :
wd - water displacement
wi - immersion in water

w - water content

Atterberg:
4pt cone unless :
cas - Casagrande method
1pt - single point test
CF - Correlation Factor

Liquid limit test: i - increasing moisture content, d - decreasing moisture content

Atterberg sample prep: n - Natural, HP - Hand Picked, w - Washed

Particle density:
sp - fluid pycnometer
gj - gas pycnometer

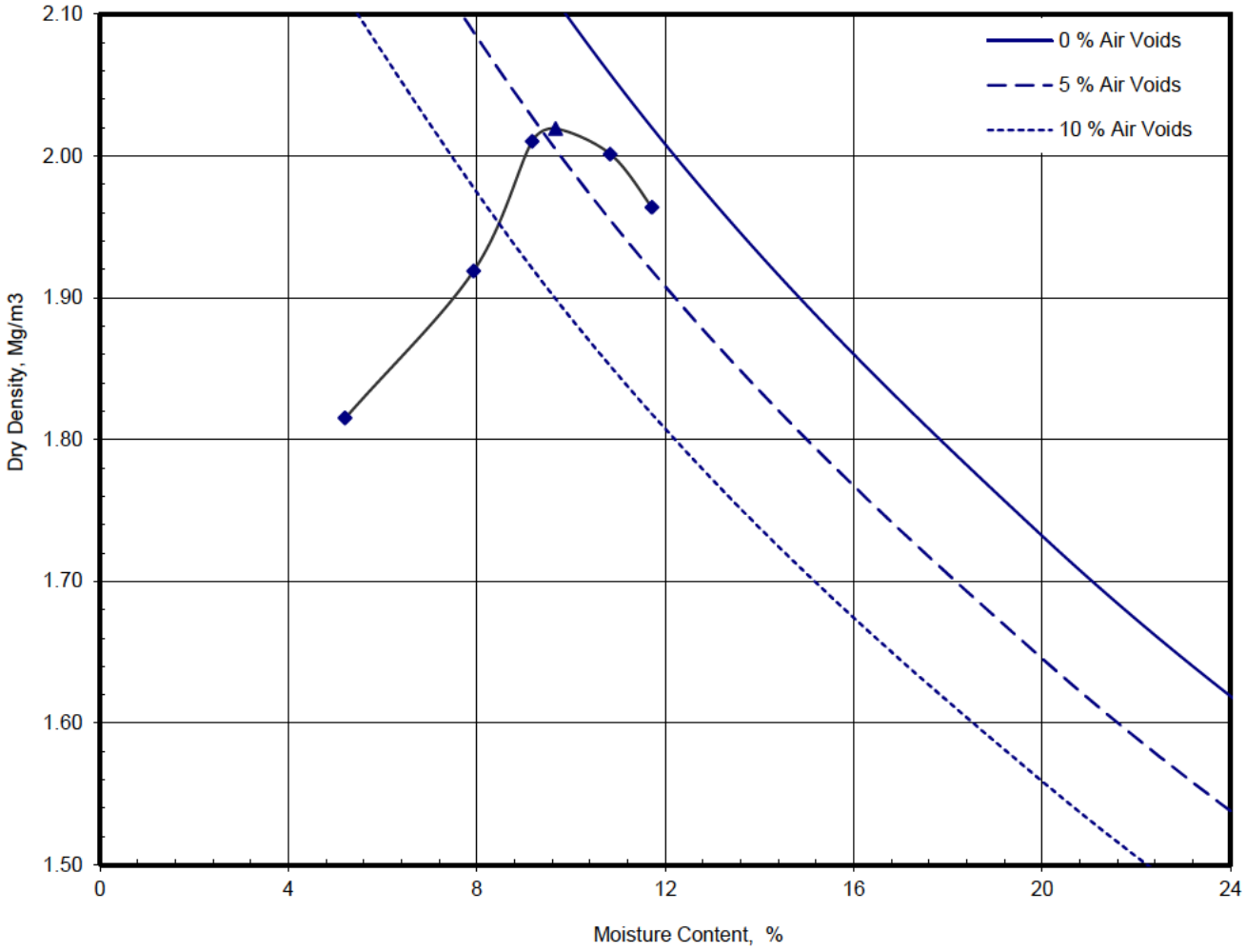
Test Standards:

Bulk Density Tests - BS EN ISO 17892-2:2014
Water Content - BS EN ISO 17892-1:2014+A1:2022
Liquid & Plastic Limits - BS EN ISO 17892-12:2018+A2:2022
Particle Density - BS EN ISO 17892-3:2015

Date Printed:
03/03/2025

ISO INDX

| GQF-008-50<br>Issue 02 - June 24 | **Dry Density / Moisture Content Relationship<br>Light Compaction** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole / Pit No | CP101 |
| Project Name | **Southampton Airport** | | | Sample No | |
| Soil Description | Light brown gravelly CLAY | | | Depth | 3.00 m |
| Specimen Ref. | | Specimen Depth | m | Sample Type | B |
| Test Method | BS1377-2:2022 | | | Keylab ID | TTLP2025021433 |




| Preparation | | Material used was natural |
|---|---|---|
| Mould Type | | CBR |
| Samples Used | | Composite specimens tested |
| Material Retained on 37.5 mm Sieve | % | 1 |
| Material Retained on 20.0 mm Sieve | % | 21 |
| Particle Density - Assumed | Mg/m³ | 2.65 |

| **Maximum Dry Density** | Mg/m³ | **2.02** |
|---|---|---|
| **Optimum Moisture Content** | % | **9.7** |

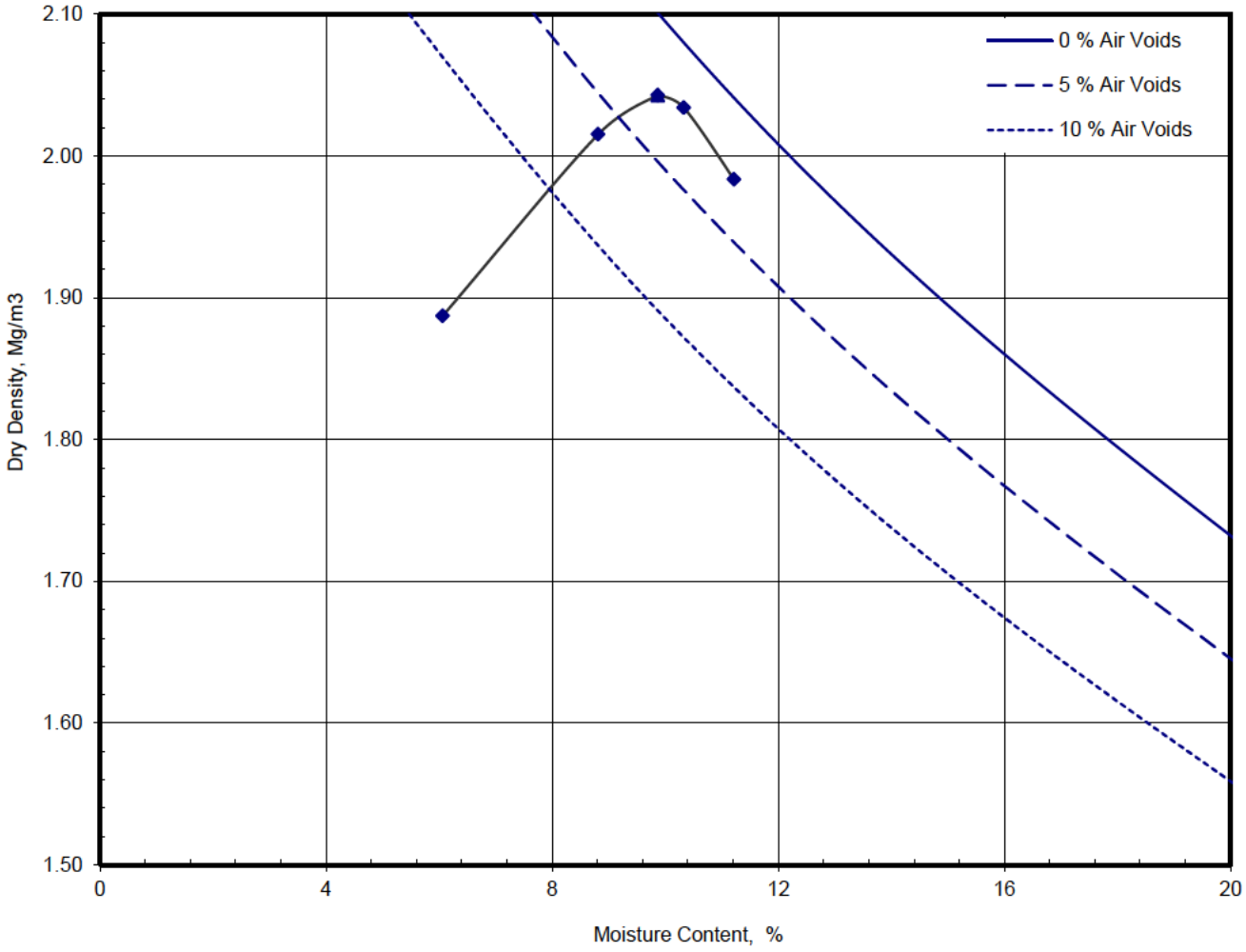
7758

Remarks

| Date Printed | 03/03/2025 | |
|---|---|---|

**COMPL**

| GQF-008-50<br>Issue 02 - June 24 | **Dry Density / Moisture Content Relationship<br>Light Compaction** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole / Pit No | CP102 |
| Project Name | **Southampton Airport** | | | Sample No | |
| Soil Description | Light brown gravelly CLAY | | | Depth | 4.00 m |
| Specimen Ref. | | Specimen Depth | m | Sample Type | B |
| Test Method | BS1377-2:2022 | | | Keylab ID | TTLP2025021434 |

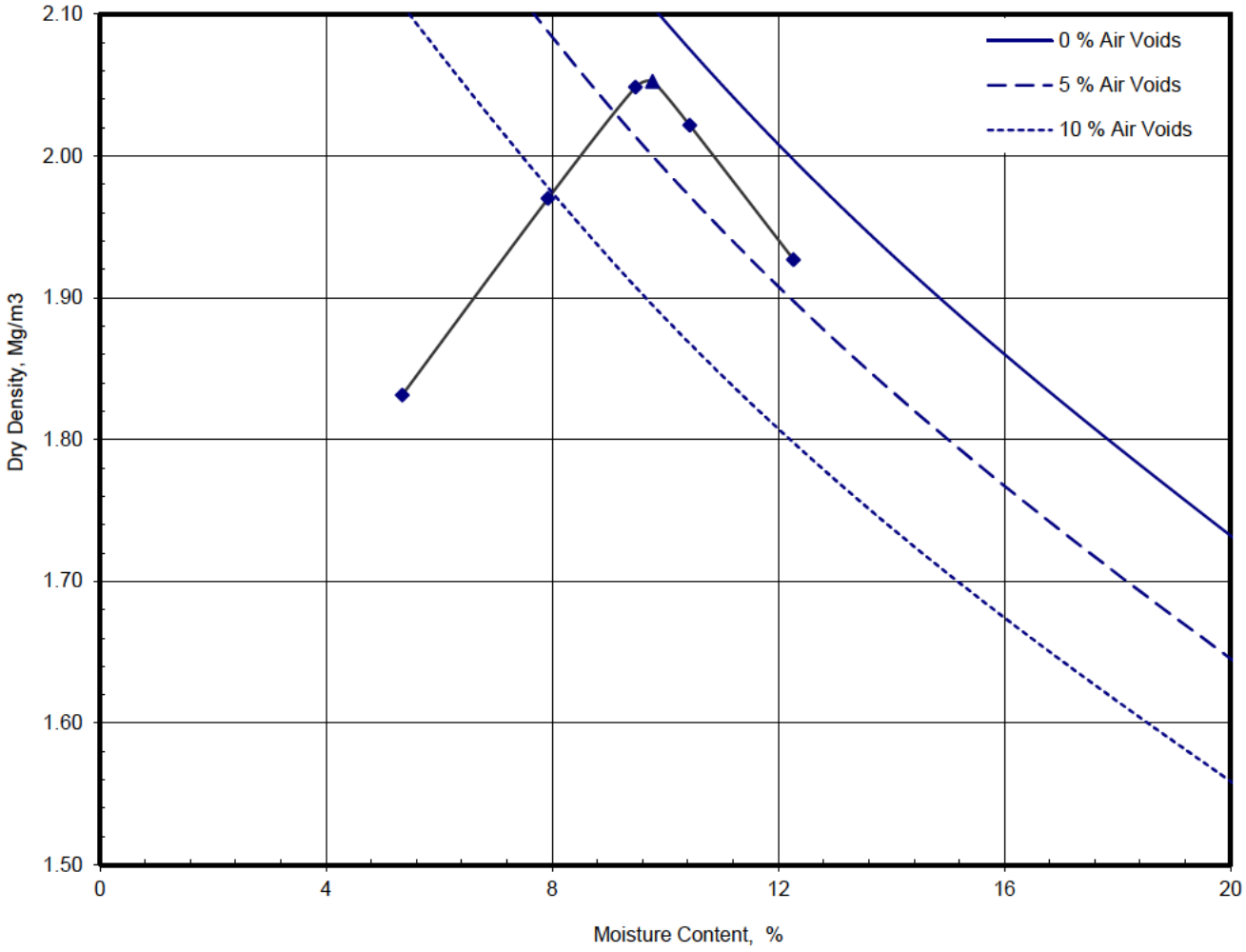



| Preparation | | Material used was natural |
|---|---|---|
| Mould Type | | CBR |
| Samples Used | | Composite specimens tested |
| Material Retained on 37.5 mm Sieve | % | 5 |
| Material Retained on 20.0 mm Sieve | % | 27 |
| Particle Density - Assumed | Mg/m³ | 2.65 |

| **Maximum Dry Density** | Mg/m³ | **2.04** |
|---|---|---|
| **Optimum Moisture Content** | % | **9.9** |

| | | Remarks | | **COMPL** |
|---|---|---|---|---|
| | 7758 | Date Printed | 03/03/2025 | |

| GQF-008-50<br>Issue 02 - June 24 | **Dry Density / Moisture Content Relationship<br>Light Compaction** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole / Pit No | TP103 |
| Project Name | **Southampton Airport** | | | Sample No | 1 |
| Soil Description | Light brown slightly sandy clayey GRAVEL | | | Depth | 2.70 m |
| Specimen Ref. | | Specimen Depth | m | Sample Type | B |
| Test Method | BS1377-2:2022 | | | Keylab ID | TTLP2025021437 |

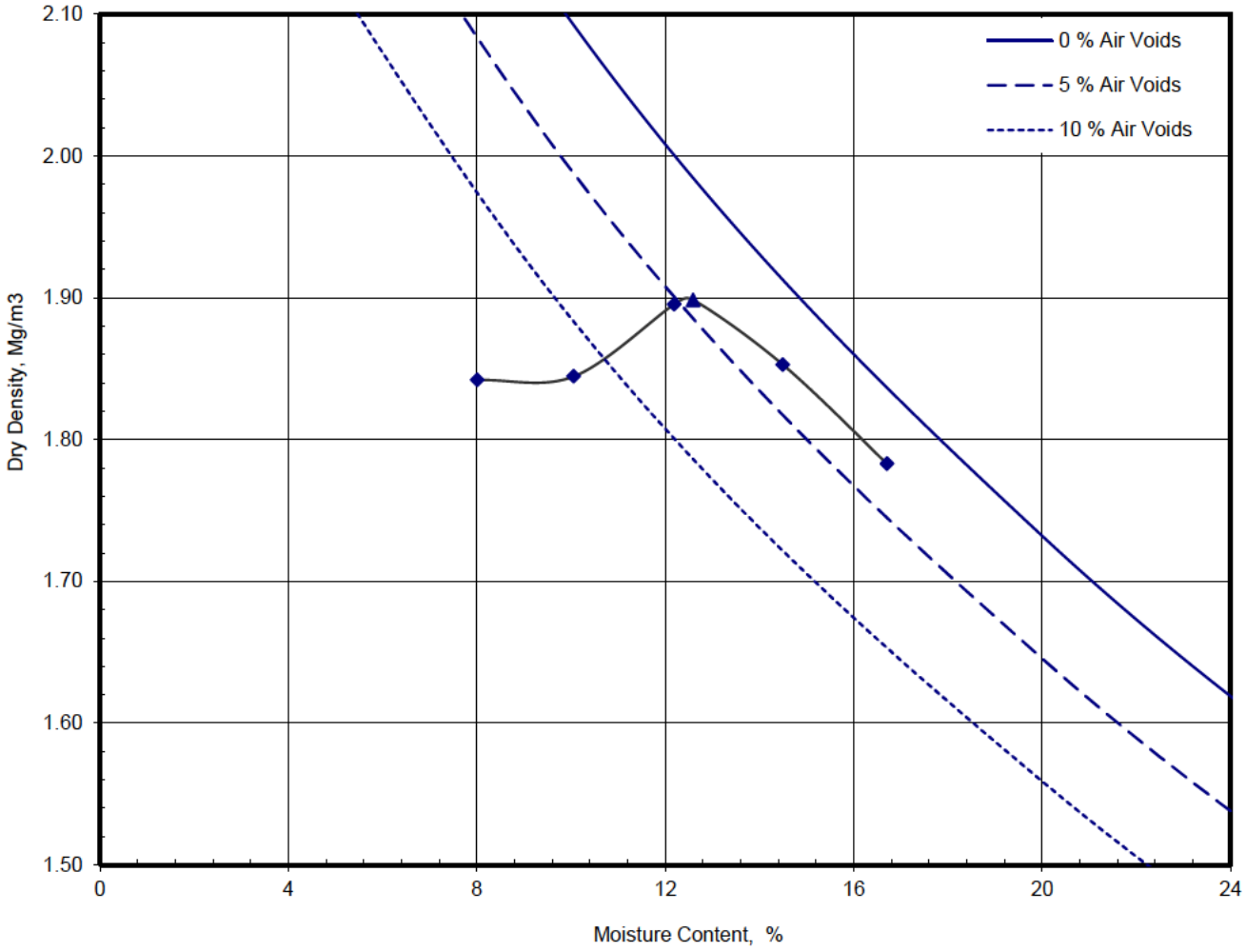



| Preparation | | Material used was natural |
|---|---|---|
| Mould Type | | CBR |
| Samples Used | | Composite specimens tested |
| Material Retained on 37.5 mm Sieve | % | 16 |
| Material Retained on 20.0 mm Sieve | % | 37 |
| Particle Density - Assumed | Mg/m³ | 2.65 |

| **Maximum Dry Density** | Mg/m³ | **2.05** |
|---|---|---|
| **Optimum Moisture Content** | % | **9.8** |

| | | Remarks | | **COMPL** |
|---|---|---|---|---|
| | 7758 | Date Printed | 03/03/2025 | |

| GQF-008-50<br>Issue 02 - June 24 | **Dry Density / Moisture Content Relationship<br>Light Compaction** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole / Pit No | TP104 |
| Project Name | **Southampton Airport** | | | Sample No | 2 |
| Soil Description | Brown slightly gravelly CLAY | | | Depth | 1.00 m |
| Specimen Ref. | | Specimen Depth | m | Sample Type | B |
| Test Method | BS1377-2:2022 | | | Keylab ID | TTLP2025021436 |

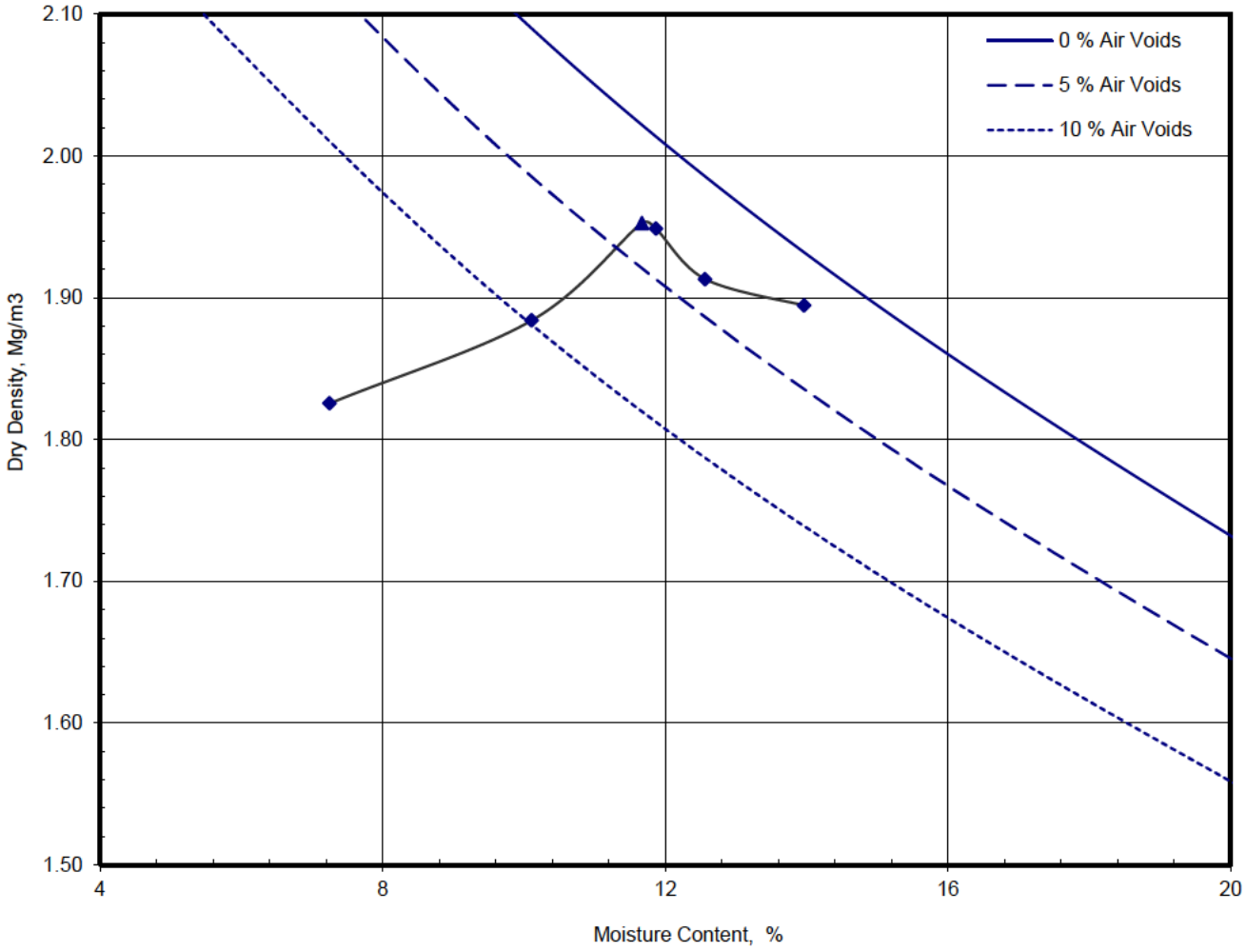



| Preparation | | Material used was natural |
|---|---|---|
| Mould Type | | CBR |
| Samples Used | | Composite specimens tested |
| Material Retained on 37.5 mm Sieve | % | 6 |
| Material Retained on 20.0 mm Sieve | % | 25 |
| Particle Density - Assumed | Mg/m³ | 2.65 |

| **Maximum Dry Density** | Mg/m³ | **1.90** |
|---|---|---|
| **Optimum Moisture Content** | % | **13** |

| | | Remarks | | **COMPL** |
|---|---|---|---|---|
| | 7758 | Date Printed | 03/03/2025 | |

| GQF-008-50<br>Issue 02 - June 24 | **Dry Density / Moisture Content Relationship<br>Light Compaction** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole / Pit No | TP104 |
| Project Name | **Southampton Airport** | | | Sample No | 3 |
| Soil Description | Light brown clayey GRAVEL | | | Depth | 2.00 m |
| Specimen Ref. | | Specimen Depth | m | Sample Type | B |
| Test Method | BS1377-2:2022 | | | Keylab ID | TTLP2025021438 |

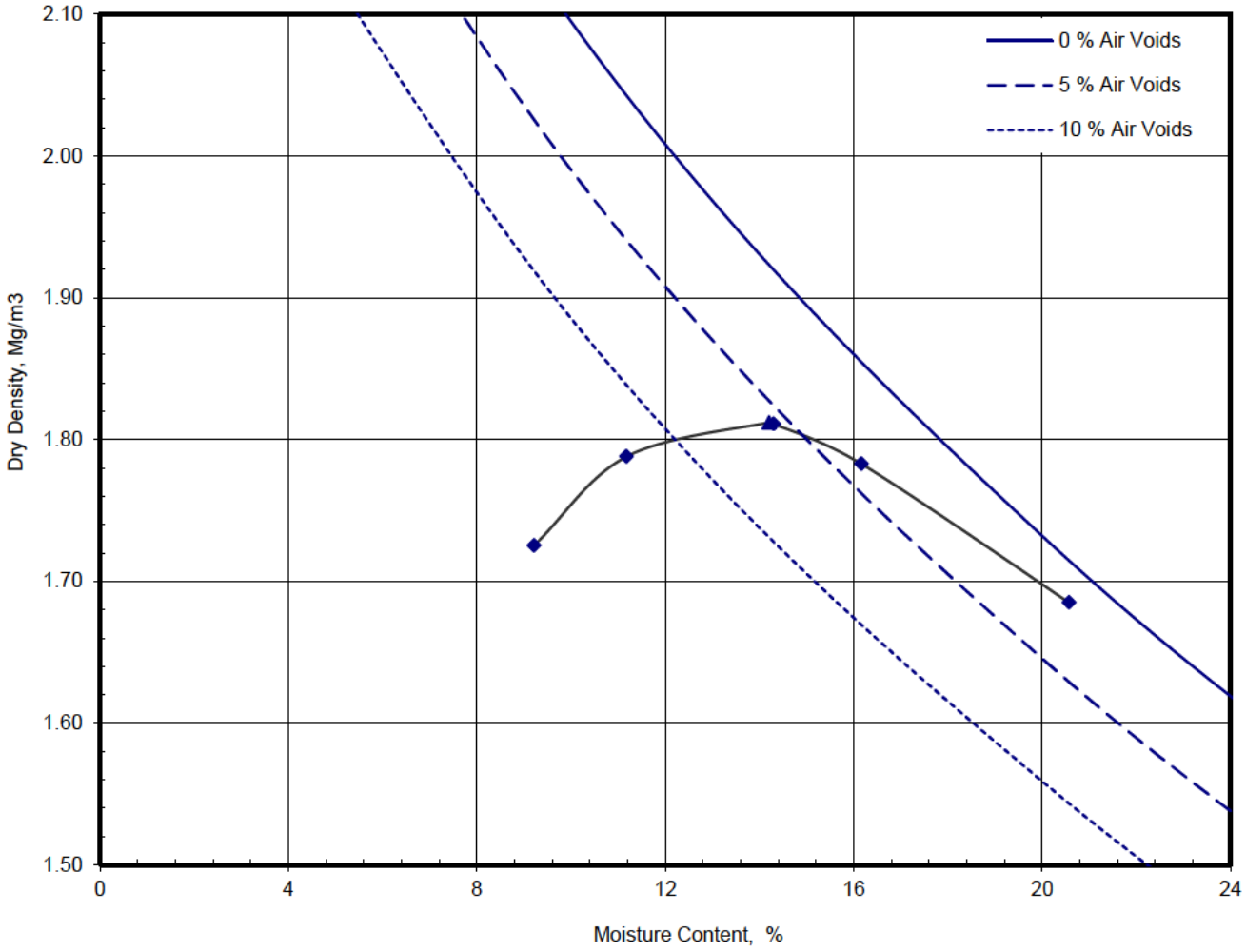



| Preparation | | Material used was natural |
|---|---|---|
| Mould Type | | CBR |
| Samples Used | | Composite specimens tested |
| Material Retained on 37.5 mm Sieve | % | 7 |
| Material Retained on 20.0 mm Sieve | % | 33 |
| Particle Density - Assumed | Mg/m³ | 2.65 |

| **Maximum Dry Density** | Mg/m³ | **1.95** |
|---|---|---|
| **Optimum Moisture Content** | % | **12** |

| | | Remarks | | **COMPL** |
|---|---|---|---|---|
| | 7758 | Date Printed | 03/03/2025 | |

| GQF-008-50<br>Issue 02 - June 24 | **Dry Density / Moisture Content Relationship<br>Light Compaction** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole / Pit No | TP106 |
| Project Name | **Southampton Airport** | | | Sample No | 1 |
| Soil Description | Light brown slightly sandy slightly gravelly CLAY | | | Depth | 0.50 m |
| Specimen Ref. | | Specimen Depth | m | Sample Type | B |
| Test Method | BS1377-2:2022 | | | Keylab ID | TTLP2025021439 |

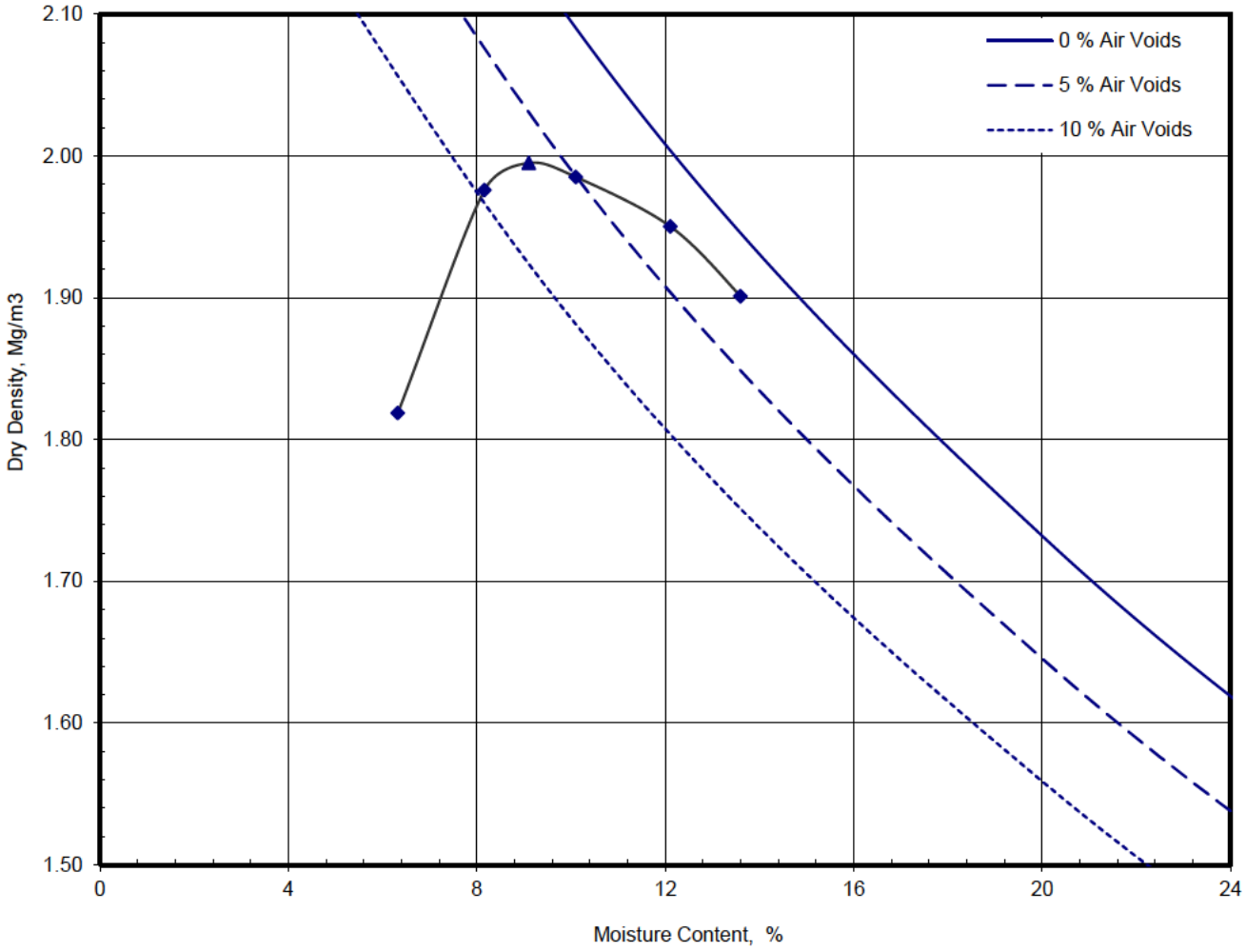



| Preparation | | Material used was natural |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 0 |
| Material Retained on 20.0 mm Sieve | % | 0 |
| Particle Density - Assumed | Mg/m³ | 2.65 |

| **Maximum Dry Density** | Mg/m³ | **1.81** |
|---|---|---|
| **Optimum Moisture Content** | % | **14** |

| | | Remarks | | **COMPL** |
|---|---|---|---|---|
| | 7758 | Date Printed | 03/03/2025 | |

| GQF-008-50<br>Issue 02 - June 24 | **Dry Density / Moisture Content Relationship<br>Light Compaction** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole / Pit No | TP107 |
| Project Name | **Southampton Airport** | | | Sample No | 2 |
| Soil Description | Yellow brown slightly sandy gravelly CLAY | | | Depth | 1.60 m |
| Specimen Ref. | | Specimen Depth | m | Sample Type | B |
| Test Method | BS1377-2:2022 | | | Keylab ID | TTLP2025021440 |

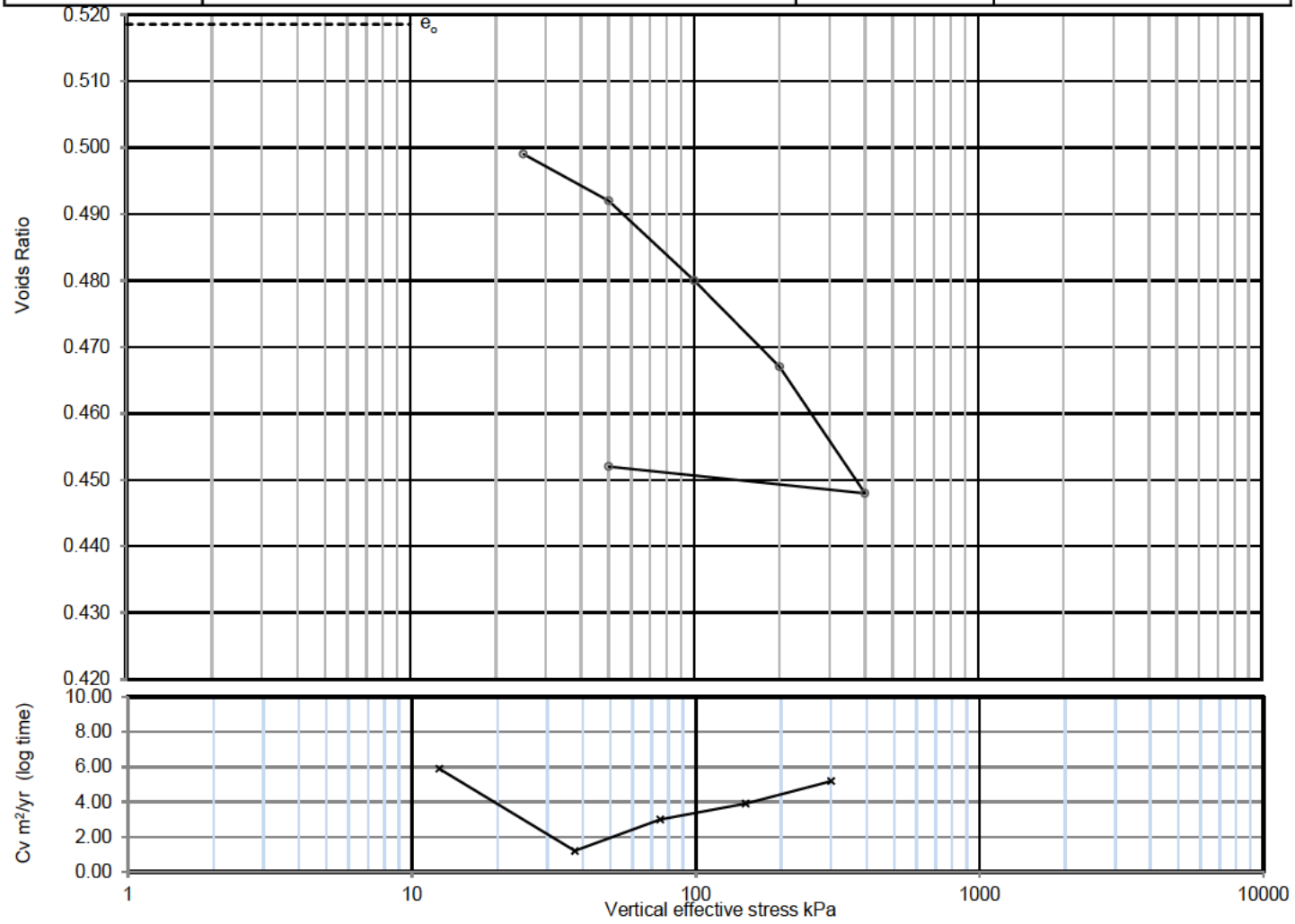



| Preparation | | Material used was natural |
|---|---|---|
| Mould Type | | CBR |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 12 |
| Material Retained on 20.0 mm Sieve | % | 42 |
| Particle Density - Assumed | Mg/m³ | 2.65 |

| **Maximum Dry Density** | Mg/m³ | **2.00** |
|---|---|---|
| **Optimum Moisture Content** | % | **9.1** |

| | | Remarks | | **COMPL** |
|---|---|---|---|---|
| | 7758 | Date Printed | 03/03/2025 | |

| GFQ-008-69 Issue 02 - Nov 23 | **Incremental Loading Oedometer Test (BS EN ISO 17892-5:2017)** | | | Job Ref | J301296 |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | CP102 |
| Project Name | Southampton Airport | | | Sample No. | |
| Soil Description | | | | Depth | 1.2 |
| Specimen Reference | | Specimen Depth | m | Sample Type | U |
| Specimen Description | Stiff brown slightly sandy gravelly CLAY | | | KeyLAB ID | TTLP2025021429 |
| Test Method | BS EN ISO 17892-5:2017 | | | Date started | |




| Applied Pressure kPa | Voids ratio | $M_v$ m²/MN | $C_v$ ( $t_{50, log}$ ) m²/yr | $C_v$ ( $t_{90, root}$ ) m²/yr | $C_{sec}$ |
|---|---|---|---|---|---|
| 0.0 | 0.519 | - | - | - | - |
| 25 | 0.499 | 0.53 | 5.9 | 6.2 | 0.00052 |
| 50 | 0.492 | 0.18 | 1.2 | 1.2 | 0.00030 |
| 100 | 0.480 | 0.15 | 3.0 | 3.1 | 0.00087 |
| 200 | 0.467 | 0.094 | 3.9 | 4.2 | 0.00039 |
| 400 | 0.448 | 0.062 | 5.2 | 3.4 | 0.00076 |
| 50 | 0.452 | 0.0073 | | | |

Preparation

Index tests Liquid limit % Plastic limit %

Particle density assumed 2.65 Mg/m³

| Specimen details | Initial | Final | |
|---|---|---|---|
| Diameter | 75.01 | - | mm |
| Height | 18.87 | 18.04 | mm |
| Water Content | 19 | 23 | % |
| Bulk density | 2.08 | 2.24 | Mg/m³ |
| Dry density | 1.75 | 1.82 | Mg/m³ |
| Voids Ratio | 0.519 | 0.452 | |
| Saturation (If Required) | | | % |
| Average temperature for test | 21 | | °C |
| Swelling Pressure | | | kPa |
| Settlement on saturation | | | % |

Remarks

Results corrected for equipment deformation

Final values should be used with caution

$C_v$ plotted at mid point of load increments

$C_v$ corrected to 20°C

Date Printed: 03/10/2023

**ISO CONSOL**

# Hand Vane Shear Strength

| Project No. | Project Name |
|---|---|
| J301296 | Southampton Airport |

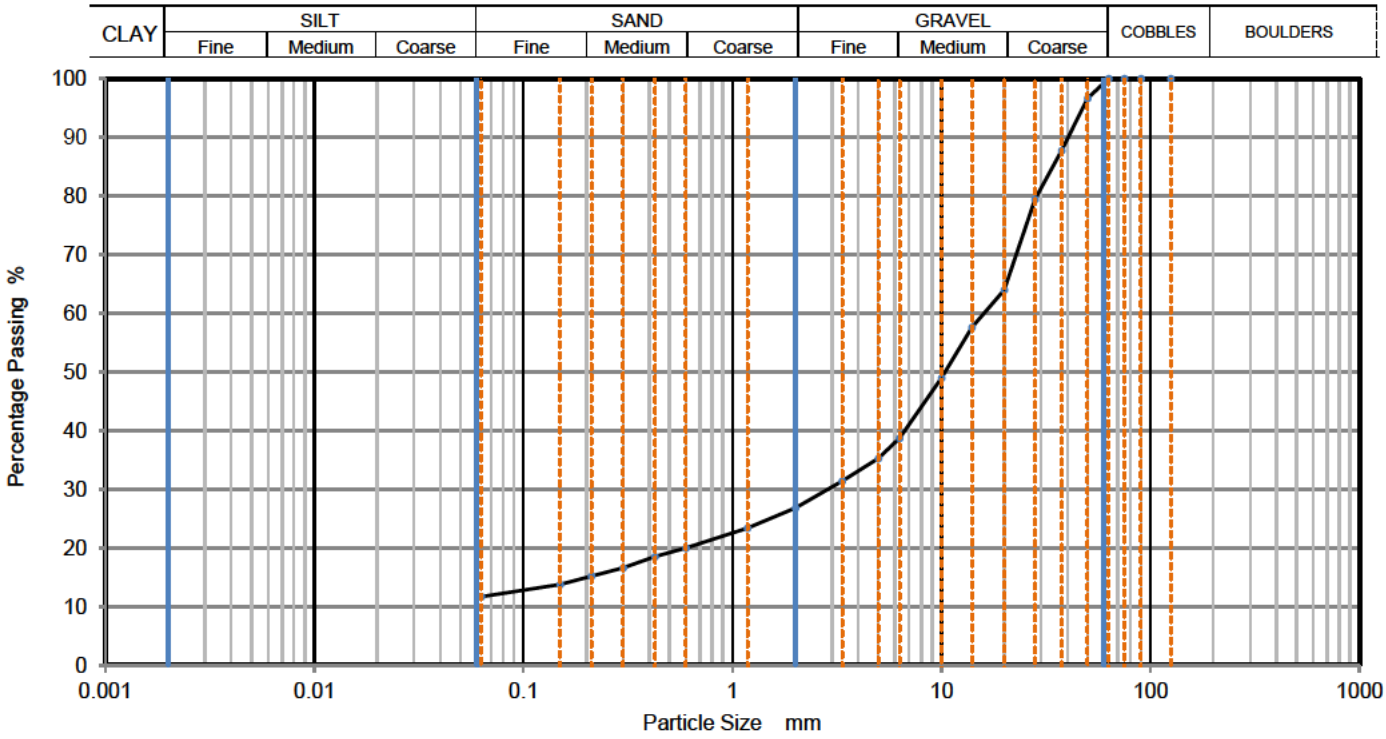
| Hole No. | Sample | | | | Soil Description | Hand Vane Determinations (kPa) | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top | Base | Type | | | | | |
| CP101 | | 5.50 | 5.95 | U | Stiff brown mottled grey thickly laminated slightly sandy silty CLAY | 44 | 43 | 28 | |
| CP102 | | 1.20 | 1.65 | U | Stiff brown slightly sandy gravelly CLAY | | | | Not enough material for testing |
| CP102 | | 7.00 | 7.30 | U | Firm brown mottled grey laminated slightly sandy silty CLAY | | | | Not enough material for testing |
| CP103 | | 5.50 | 5.95 | U | Stiff brown mottled grey slightly sandy silty CLAY | 122 | 130 | 130 | |
| CP104 | | 5.50 | 5.95 | U | Firm brown mottled grey slightly sandy silty fissured CLAY | 110 | 118 | 120 | |

Notes:
Tests carried out in accordance with Manufacturers Instructions

| Tested | Approved |
|---|---|
| | |

HAND VANE

| GFQ-008-77<br>Issue 02 - Nov 23 | **Determination of Particle Size Distribution (ISO 17892-4:2016)** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | CP102 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Light brown clayey sandy GRAVEL | | | Depth, m | 3.00 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Test Method | ISO 17892 -4, by sieving on pre-dried or dry sample | | | KeyLAB ID | TTLP2025021420 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 97 | | |
| 37.5 | 88 | | |
| 28 | 79 | | |
| 20 | 64 | | |
| 14 | 58 | | |
| 10 | 49 | | |
| 6.3 | 39 | | |
| 5 | 35 | | |
| 3.35 | 31 | | |
| 2 | 27 | | |
| 1.18 | 23 | | |
| 0.6 | 20 | | |
| 0.425 | 19 | | |
| 0.3 | 17 | | |
| 0.212 | 15 | | |
| 0.15 | 14 | | |
| 0.063 | 12 | | |

| Dry Mass of sample, g | 6988 |
|---|---|

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 73 |
| Sand | 15 |
| | |
| Fines <0.063mm | 12 |

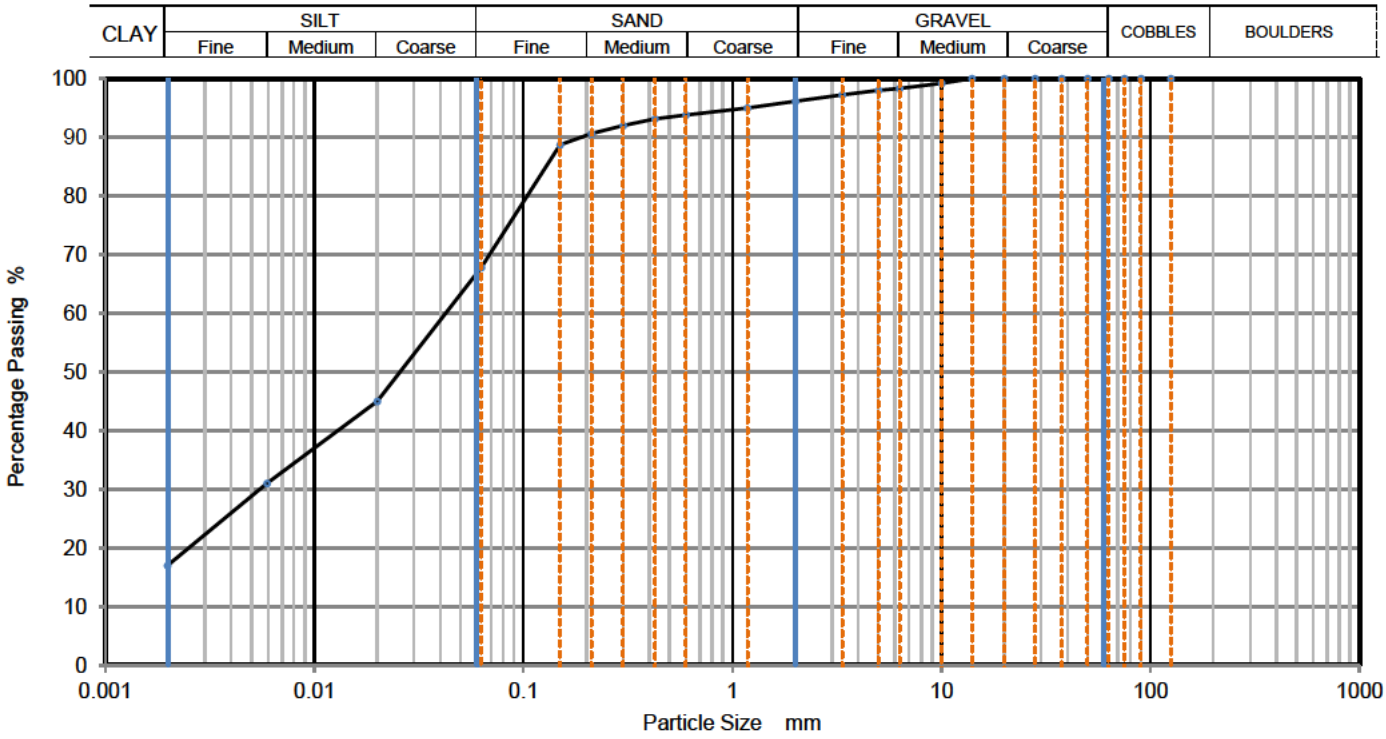
| **Grading Analysis** | | |
|---|---|---|
| D100 | mm | 63 |
| D60 | mm | 16 |
| D30 | mm | 2.87 |
| D10 | mm | |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |
| Pretreatment Method (If Applicable) | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Date Printed: 03/03/2025 | | **ISO PSD** |
|---|---|---|

| GFQ-008-77<br>Issue 02 - Nov 23 | **Determination of Particle Size Distribution (ISO 17892-4:2016)** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | CP103 |
| Project Name | Southampton Airport | | | Sample No. | |
| Soil Description | Brown mottled grey slightly sandy silty CLAY | | | Depth, m | 4.20 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Test Method | ISO 17892 -4, by sieving and pipette sedimentation | | | KeyLAB ID | TTLP2025021435 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 45 |
| 90 | 100 | 0.0059 | 31 |
| 75 | 100 | 0.0020 | 17 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 99 | | |
| 6.3 | 98 | | |
| 5 | 98 | | |
| 3.35 | 97 | | |
| 2 | 96 | | |
| 1.18 | 95 | | |
| 0.6 | 94 | Particle density (assumed) | |
| 0.425 | 93 | 2.65 | Mg/m3 |
| 0.3 | 92 | | |
| 0.212 | 91 | | |
| 0.15 | 89 | | |
| 0.063 | 68 | | |

Dry Mass of sample, g: 1023

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 4 |
| Sand | 28 |
| Silt | 51 |
| Clay | 17 |

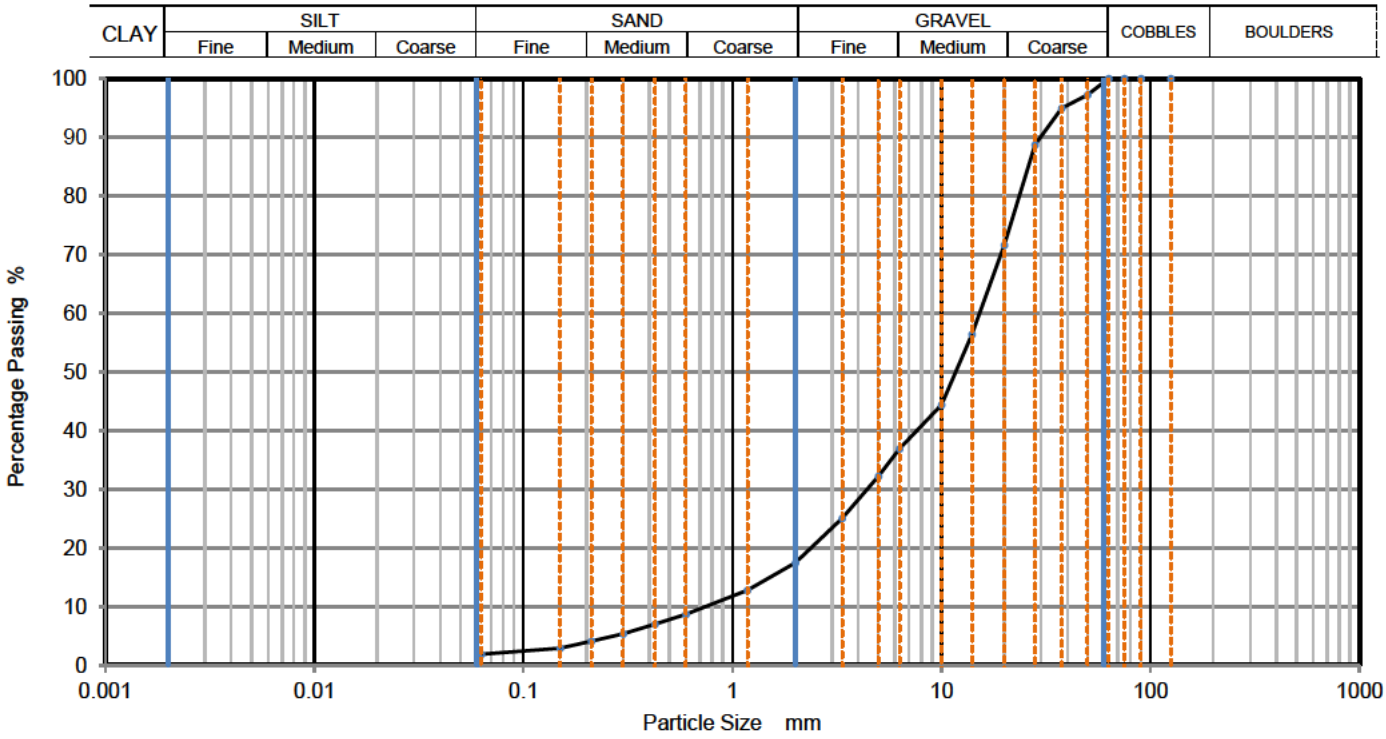
| Grading Analysis | | |
|---|---|---|
| D100 | mm | 14 |
| D60 | mm | 0.0423 |
| D30 | mm | 0.0057 |
| D10 | mm | |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |
| Pretreatment Method (If Applicable) | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Date Printed: | | **ISO PSD** |
|---|---|---|
| 03/03/2025 | | |

| GFQ-008-77<br>Issue 02 - Nov 23 | **Determination of Particle Size Distribution (ISO 17892-4:2016)** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | CP104 |
| Project Name | Southampton Airport | | | Sample No. | |
| Soil Description | Light brown slightly clayey sandy GRAVEL | | | Depth, m | 4.00 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Test Method | ISO 17892 -4, by sieving on pre-dried or dry sample | | | KeyLAB ID | TTLP2025021422 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 97 | | |
| 37.5 | 95 | | |
| 28 | 89 | | |
| 20 | 72 | | |
| 14 | 56 | | |
| 10 | 44 | | |
| 6.3 | 37 | | |
| 5 | 32 | | |
| 3.35 | 25 | | |
| 2 | 18 | | |
| 1.18 | 13 | | |
| 0.6 | 9 | | |
| 0.425 | 7 | | |
| 0.3 | 5 | | |
| 0.212 | 4 | | |
| 0.15 | 3 | | |
| 0.063 | 2 | | |

| Dry Mass of sample, g | 5681 |
|---|---|

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 82 |
| Sand | 16 |
| | |
| Fines <0.063mm | 2 |

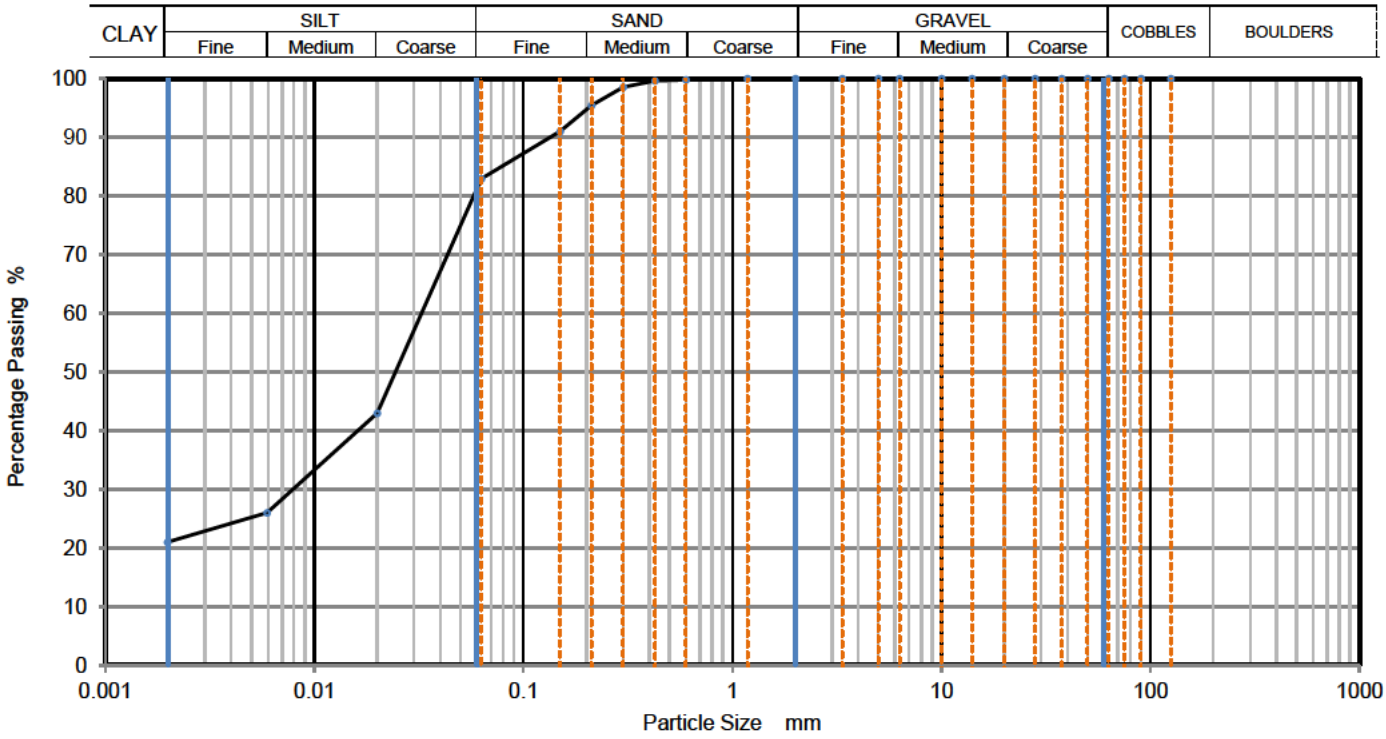
| **Grading Analysis** | | |
|---|---|---|
| D100 | mm | 63 |
| D60 | mm | 15.2 |
| D30 | mm | 4.42 |
| D10 | mm | 0.749 |
| Uniformity Coefficient | | 20 |
| Curvature Coefficient | | 1.7 |
| Pretreatment Method (If Applicable) | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Date Printed: | | **ISO PSD** |
|---|---|---|
| 03/03/2025 | | |

| GFQ-008-77<br>Issue 02 - Nov 23 | **Determination of Particle Size Distribution (ISO 17892-4:2016)** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | HP106 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Orange brown slightly sandy silty CLAY | | | Depth, m | 0.30 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Test Method | ISO 17892 -4, by sieving and pipette sedimentation | | | KeyLAB ID | TTLP2025021424 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 43 |
| 90 | 100 | 0.0059 | 26 |
| 75 | 100 | 0.0020 | 21 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | Particle density (assumed) | |
| 0.425 | 100 | 2.65 | Mg/m3 |
| 0.3 | 99 | | |
| 0.212 | 95 | | |
| 0.15 | 91 | | |
| 0.063 | 83 | | |

Dry Mass of sample, g: 1248

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 0 |
| Sand | 17 |
| Silt | 62 |
| Clay | 21 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 3.35 |
| D60 | mm | 0.0328 |
| D30 | mm | 0.00808 |
| D10 | mm | |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |
| Pretreatment Method (If Applicable) | | |

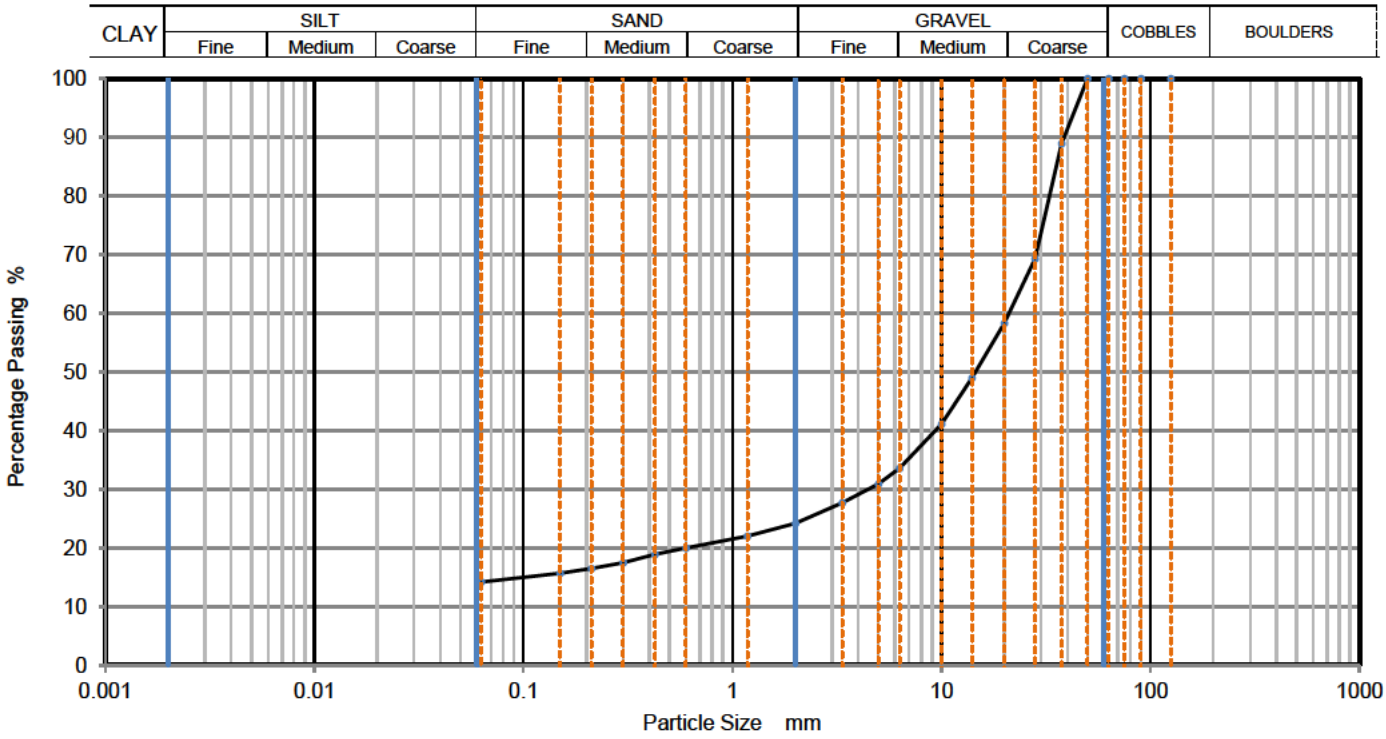
Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

Date Printed: 03/03/2025

**ISO PSD**

| GFQ-008-77<br>Issue 02 - Nov 23 | **Determination of Particle Size Distribution (ISO 17892-4:2016)** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP101 |
| Project Name | Southampton Airport | | | Sample No. | 2 |
| Soil Description | Light brown clayey sandy GRAVEL | | | Depth, m | 2.30 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Test Method | ISO 17892 -4, by sieving on pre-dried or dry sample | | | KeyLAB ID | TTLP2025021423 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 89 | | |
| 28 | 69 | | |
| 20 | 58 | | |
| 14 | 49 | | |
| 10 | 41 | | |
| 6.3 | 34 | | |
| 5 | 31 | | |
| 3.35 | 28 | | |
| 2 | 24 | | |
| 1.18 | 22 | | |
| 0.6 | 20 | | |
| 0.425 | 19 | | |
| 0.3 | 18 | | |
| 0.212 | 17 | | |
| 0.15 | 16 | | |
| 0.063 | 14 | | |

| Dry Mass of sample, g | 4239 |
|---|---|

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 76 |
| Sand | 10 |
| | |
| Fines <0.063mm | 14 |

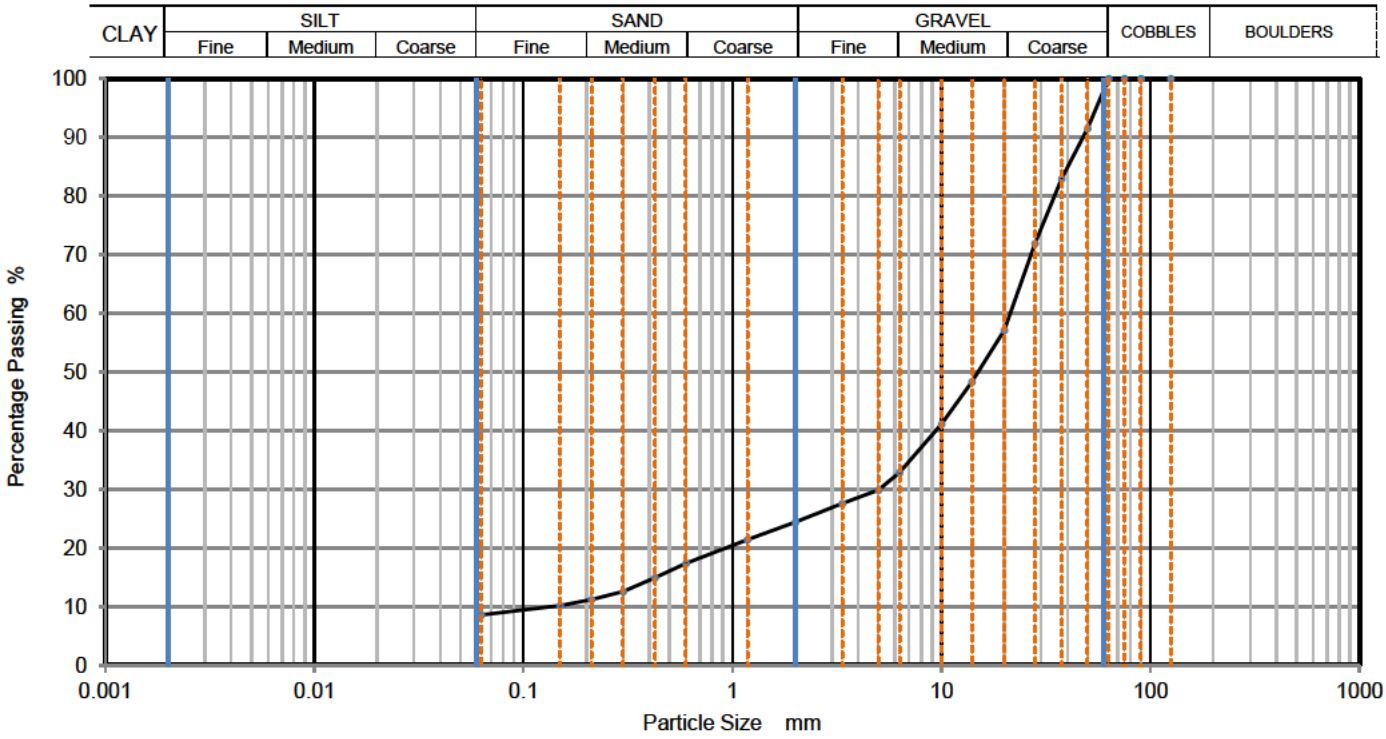
| **Grading Analysis** | | |
|---|---|---|
| D100 | mm | 50 |
| D60 | mm | 21.1 |
| D30 | mm | 4.46 |
| D10 | mm | |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |
| Pretreatment Method (If Applicable) | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Date Printed: | | **ISO PSD** |
|---|---|---|
| 03/03/2025 | | |

| GFQ-008-77<br>Issue 02 - Nov 23 | **Determination of Particle Size Distribution (ISO 17892-4:2016)** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP105 |
| Project Name | Southampton Airport | | | Sample No. | 3 |
| Soil Description | Orange brown clayey sandy GRAVEL | | | Depth, m | 2.80 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Test Method | ISO 17892 -4, by sieving on as received or wet sample | | | KeyLAB ID | TTLP2025021421 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 92 | | |
| 37.5 | 83 | | |
| 28 | 72 | | |
| 20 | 57 | | |
| 14 | 48 | | |
| 10 | 41 | | |
| 6.3 | 33 | | |
| 5 | 30 | | |
| 3.35 | 28 | | |
| 2 | 24 | | |
| 1.18 | 21 | | |
| 0.6 | 17 | | |
| 0.425 | 15 | | |
| 0.3 | 13 | | |
| 0.212 | 11 | | |
| 0.15 | 10 | | |
| 0.063 | 9 | | |

| Dry Mass of sample, g | 17879 |
|---|---|

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 75 |
| Sand | 16 |
| | |
| Fines <0.063mm | 9 |

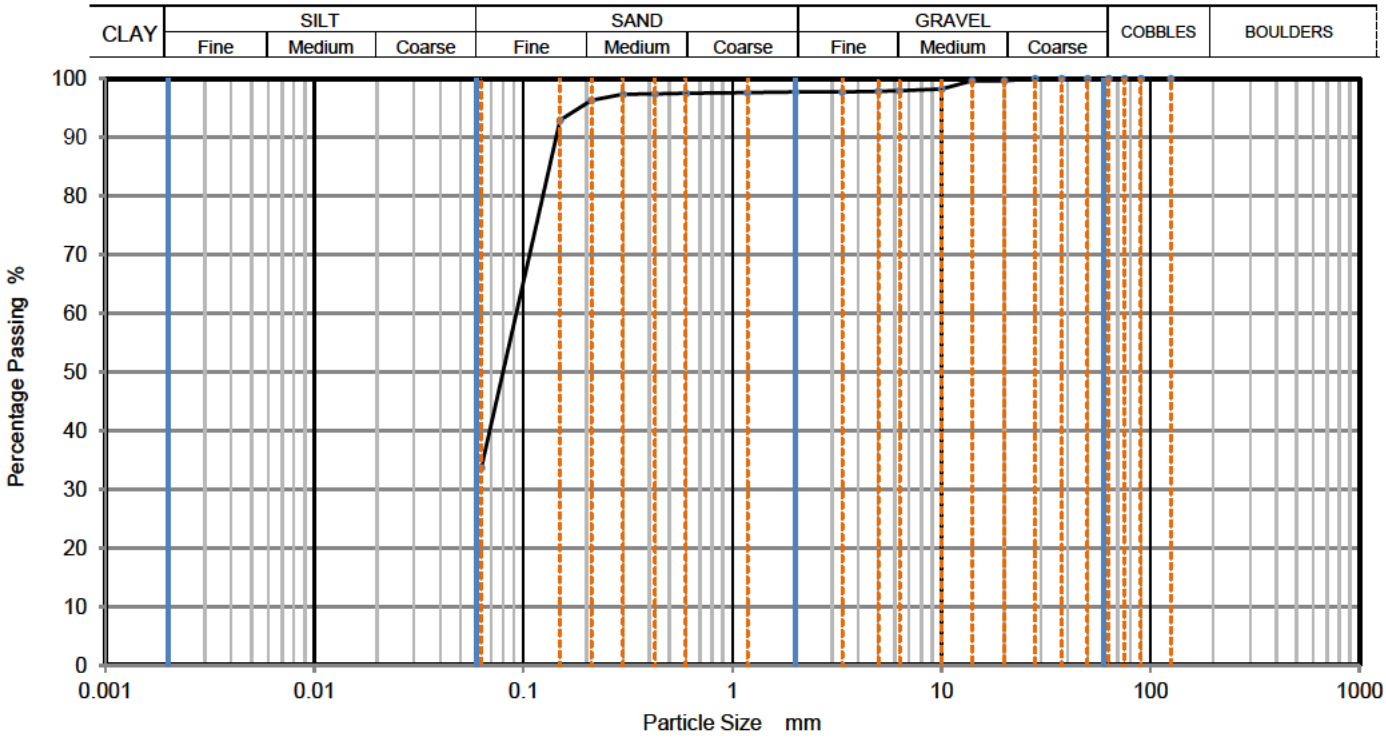
| **Grading Analysis** | | |
|---|---|---|
| D100 | mm | 63 |
| D60 | mm | 21.4 |
| D30 | mm | 5.03 |
| D10 | mm | 0.133 |
| Uniformity Coefficient | | 160 |
| Curvature Coefficient | | 8.9 |
| Pretreatment Method (If Applicable) | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Date Printed: 03/03/2025 | | **ISO PSD** |
|---|---|---|

| GFQ-008-77<br>Issue 02 - Nov 23 | **Determination of Particle Size Distribution (ISO 17892-4:2016)** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP109 |
| Project Name | Southampton Airport | | | Sample No. | 2 |
| Soil Description | Grey slightly sandy silty CLAY | | | Depth, m | 3.30 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Test Method | ISO 17892 -4, by sieving on pre-dried or dry sample | | | KeyLAB ID | TTLP2025021417 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 98 | | |
| 6.3 | 98 | | |
| 5 | 98 | | |
| 3.35 | 98 | | |
| 2 | 98 | | |
| 1.18 | 98 | | |
| 0.6 | 98 | | |
| 0.425 | 97 | | |
| 0.3 | 97 | | |
| 0.212 | 96 | | |
| 0.15 | 93 | | |
| 0.063 | 34 | | |

| Dry Mass of sample, g | 2464 |
|---|---|

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 2 |
| Sand | 64 |
| | |
| Fines <0.063mm | 34 |

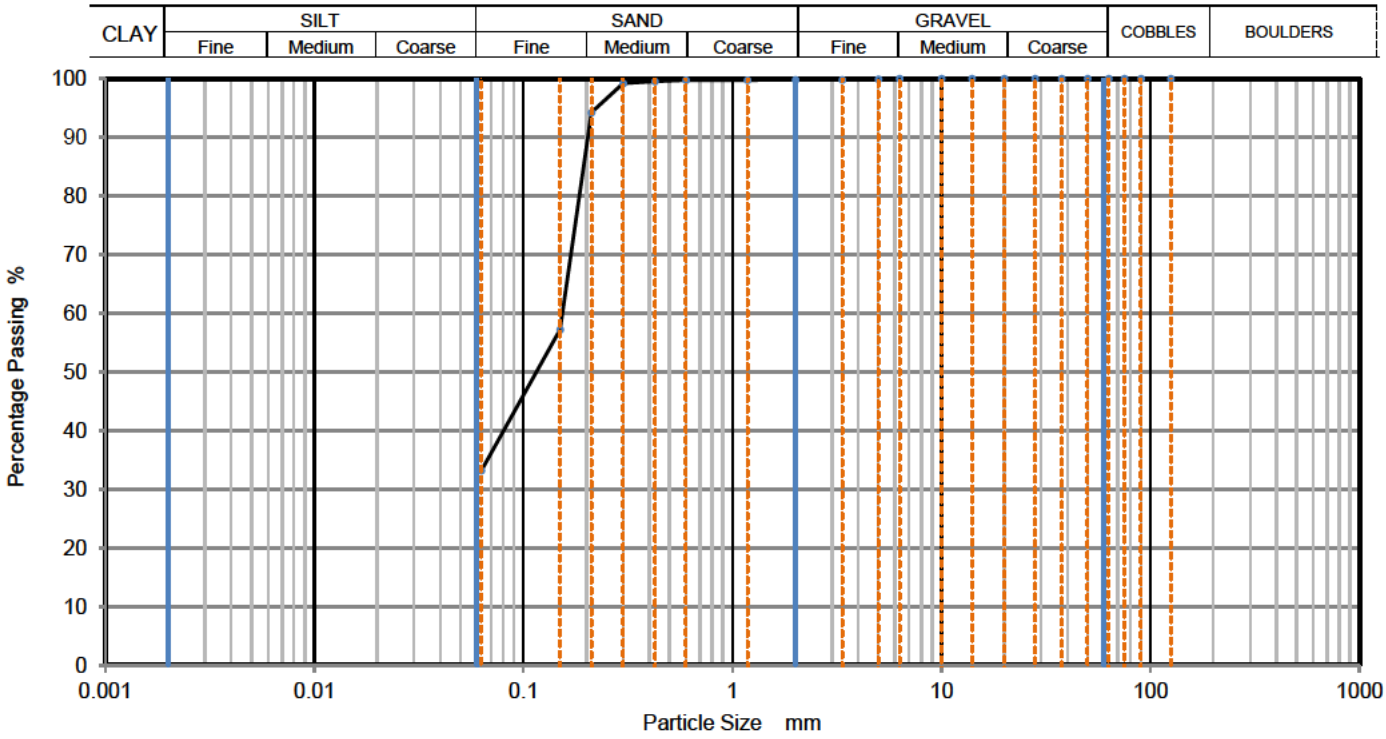
| Grading Analysis | | |
|---|---|---|
| D100 | mm | 28 |
| D60 | mm | 0.0926 |
| D30 | mm | |
| D10 | mm | |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |
| Pretreatment Method (If Applicable) | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Date Printed: | | |
|---|---|---|
| 03/03/2025 | TTL | **ISO PSD** |

| GFQ-008-77<br>Issue 02 - Nov 23 | **Determination of Particle Size Distribution (ISO 17892-4:2016)** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP111 |
| Project Name | Southampton Airport | | | Sample No. | 2 |
| Soil Description | Green brown slightly sandy silty CLAY | | | Depth, m | 2.30 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Test Method | ISO 17892 -4, by sieving on pre-dried or dry sample | | | KeyLAB ID | TTLP2025021418 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 100 | | |
| 0.3 | 99 | | |
| 0.212 | 94 | | |
| 0.15 | 57 | | |
| 0.063 | 33 | | |

| Dry Mass of sample, g | 2278 |
|---|---|

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 0 |
| Sand | 67 |
| | |
| Fines <0.063mm | 33 |

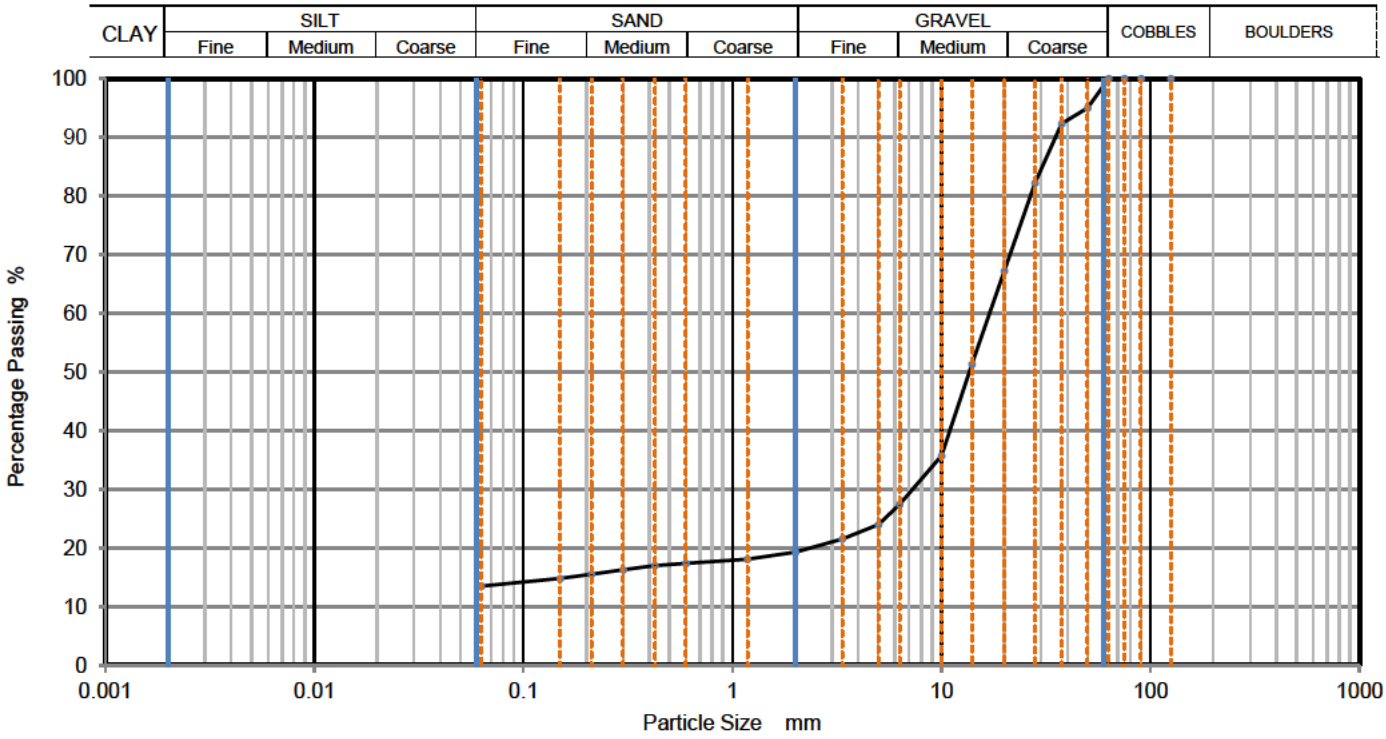
| **Grading Analysis** | | |
|---|---|---|
| D100 | mm | 6.3 |
| D60 | mm | 0.154 |
| D30 | mm | |
| D10 | mm | |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |
| Pretreatment Method (If Applicable) | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Date Printed: 03/03/2025 | TTL | **ISO PSD** |
|---|---|---|

| GFQ-008-77<br>Issue 02 - Nov 23 | **Determination of Particle Size Distribution (ISO 17892-4:2016)** | | | Job Ref | **J301296** |
|---|---|---|---|---|---|
| | | | | Borehole/Pit No. | TP112 |
| Project Name | Southampton Airport | | | Sample No. | 1 |
| Soil Description | Brown slightly sandy clayey GRAVEL | | | Depth, m | 0.90 |
| Specimen Reference | | Specimen Depth | m | Sample Type | B |
| Test Method | ISO 17892 -4, by sieving on pre-dried or dry sample | | | KeyLAB ID | TTLP2025021419 |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 95 | | |
| 37.5 | 92 | | |
| 28 | 82 | | |
| 20 | 67 | | |
| 14 | 51 | | |
| 10 | 36 | | |
| 6.3 | 27 | | |
| 5 | 24 | | |
| 3.35 | 22 | | |
| 2 | 19 | | |
| 1.18 | 18 | | |
| 0.6 | 17 | | |
| 0.425 | 17 | | |
| 0.3 | 16 | | |
| 0.212 | 16 | | |
| 0.15 | 15 | | |
| 0.063 | 14 | | |

| Dry Mass of sample, g | 4567 |
|---|---|

| **Sample Proportions** | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 80 |
| Sand | 6 |
| | |
| Fines <0.063mm | 14 |

| **Grading Analysis** | | |
|---|---|---|
| D100 | mm | 63 |
| D60 | mm | 17 |
| D30 | mm | 7.3 |
| D10 | mm | |
| Uniformity Coefficient | | |
| Curvature Coefficient | | |
| Pretreatment Method (If Applicable) | | |

Remarks

Preparation and testing performed to BS EN ISO 17892-4 unless noted below

| Date Printed: | | **ISO PSD** |
|---|---|---|
| 03/03/2025 | | |

| GFQ-008-80<br>Issue 01 - Oct 23 | **Unconsolidated Undrained Triaxial Compression tests without measurement of pore pressure<br>Summary of Results** |
|---|---|
| Project No.<br>J301296 | Project Name<br>Southampton Airport |

| Hole No. | Sample | | | | Soil Description | Test Type | Density | | $w$ | Length | Diameter | $\sigma_3$ | At failure | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ref | Top | Base | Type | | | bulk | dry | | | | | Axial strain | $\sigma_1 - \sigma_3$ | $c_u$ | Mode | |
| | | | | | | | Mg/m³ | | % | mm | mm | kPa | % | kPa | kPa | | |
| CP101 | | 5.50 | 5.95 | U | Stiff brown mottled grey thickly laminated slightly sandy silty CLAY | UU | 1.93 | 1.42 | 35.9 | 200.5 | 102.7 | 110 | 12.5 | 151 | 76 | C | |
| CP102 | | 1.20 | 1.65 | U | Stiff brown slightly sandy gravelly CLAY | UU | 1.86 | 1.64 | 13.5 | 202.0 | 103.3 | 25 | 5.9 | 222 | 111 | B | |
| CP102 | | 7.00 | 7.30 | U | Firm brown mottled grey laminated slightly sandy silty CLAY | UU | 1.98 | 1.53 | 29.0 | 200.1 | 102.9 | 140 | 15.0 | 115 | 57 | B | |
| CP103 | | 5.50 | 5.95 | U | Stiff brown mottled grey slightly sandy silty CLAY | UU | 1.89 | 1.42 | 32.6 | 202.1 | 103.3 | 110 | 4.0 | 202 | 101 | B | |
| CP104 | | 5.50 | 5.95 | U | Firm brown mottled grey slightly sandy silty fissured CLAY | UU | 1.88 | 1.37 | 37.1 | 201.3 | 103.0 | 110 | 8.4 | 130 | 65 | B | |

| Legend | | | | Mode of failure ; |
|---|---|---|---|---|
| | UU - single stage test (single and multiple specimens) | $\sigma_3$ | Cell pressure | B - Brittle |
| | UUM - Multistage test on a single specimen | $\sigma_1 - \sigma_3$ | Maximum corrected deviator stress | P - Plastic |
| | suffix R - remoulded or recompacted | $c_u$ | Undrained shear strength, ½ ($\sigma_1 - \sigma_3$) | C - Compound |

Notes

Tests carried out in accordance with ISO 17892-8. Tests performed at a nominal rate of strain of 2%/min unless annotated otherwise. See individual test reports for further details.

Date Printed:

03/03/2025

**ISO QU SUM**

# Appendix G – Risk Assessment Terminology

## Definitions and Classifications of Risk Assessment Terminology.

### Probability

Probability can be defined as the chance of a particular event occurring in a given period of time.

Descriptions of each of the four qualitative terms to be use in this report to describe the perceived probability of any identified pollutant linkage becoming realised are shown below in Table W.

| Term | Description |
|---|---|
| **High Likelihood** | There is pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution. |
| **Likely** | There is pollutant linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term. |
| **Low Likelihood** | There is pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term. |
| **Unlikely** | There is pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term. |

Table W. Description of Probability Classifications

## Severity

Severity (consequence) can be defined as the adverse effects (or harm) arising from a defined hazard, which impairs the quality of human health or the environment in the short or longer term.

Descriptions of each of the four qualitative terms to be use in this report to describe the perceived potential severity of any identified pollutant linkage becoming realised are shown below in Table X.

| Term | Description |
|---|---|
| **Severe** | Highly elevated concentrations **likely** to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs.<br><br>Equivalent to **EA Category 1** pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.<br><br>Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.<br><br>Catastrophic damage to crops, buildings or property. |
| **Medium** | Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs.<br><br>Equivalent to **EA Category 2** pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.<br><br>Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.<br><br>Significant damage to crops, buildings or property. |
| **Mild** | Exposure to human health **unlikely** to lead to "significant harm". Equivalent to **EA Category 3** pollution incident including minimal or short-lived effect on water quality; marginal effect on amenity value, agriculture or commerce.<br><br>Minor or short-lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population.<br><br>Minor damage to crops, buildings or property. |
| **Minor** | No measurable effect on humans.<br><br>Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.<br><br>Repairable effects of damage to buildings, structures and services. |

Table X. Description of Severity Classifications

Once the severity and probability of a pollutant linkage has been determined the risk can be assessed using the risk matrix shown overleaf on Table Y.

## Risk Matrix

By cross referencing the derived severity and probability in Table Y, below the perceived potential risk can be determined.

| | | Severity | | | |
|---|---|---|---|---|---|
| | | Severe | Medium | Mild | Minor |
| Probability | High Likelihood | Very High Risk | High Risk | Moderate Risk | Moderate / Low Risk |
| | Likely | High Risk | Moderate Risk | Moderate / Low Risk | Low Risk |
| | Low Likelihood | Moderate Risk | Moderate / Low Risk | Low Risk | Very Low Risk |
| | Unlikely | Moderate / Low Risk | Low Risk | Very Low Risk | Very Low Risk |

Table Y. Risk Assessment Matrix

The risk categories detailed above are defined below in the following Table Z.

| Term | Description |
|---|---|
| **Very High Risk** | There is a high probability that significant harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action. |
| **High Risk** | Significant harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action. |
| **Moderate Risk** | It is possible that without appropriate remedial action, harm could arise to a designated receptor but it is relatively unlikely that any such harm would be severe and if any harm were to occur, it is likely that such harm would be relatively mild. |
| **Low Risk** | It is possible that significant harm could arise to a designated receptor from an identified hazard but it is likely that at worst this harm if realised would normally be mild. |
| **Very Low Risk** | There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe. |

Table Z. Definition of Risk

## 12.0 References

*British Standards Institute*

BS10175:2011 Investigation of potentially contaminated land sites – code of practice.

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