

NAVIGATOR QUARTER, LAND ADJACENT TO SOUTHAMPTON AIRPORT

GEO-ENVIRONMENTAL ASSESSMENT

HYBRID PLANNING APPLICATION

APRIL 2025

blocwork (Eastleigh) LLP
&
Southampton International Airport Ltd

NAVIGATOR QUARTER

Intelligent Ground Solutions

Geo-Environmental Assessment

Navigator Quarter, Southampton
Mitchell Way, SO50 5QJ

For Blocwork (Eastleigh) LLP and AGS Airports Group Limited

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Executive Summary

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. 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. 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. 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, to date, records groundwater between 2.96 m bgl to 4.88 m bgl (9.03 m AOD to 9.90 m AOD).

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. 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. 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. ***The risk from ground gas will be assessed following completion of the monitoring regime.***
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; • Suitable safe working procedures during development such as a discovery strategy; • 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; • Potential for upgraded water supply pipes; • Additional waste classification testing may be required; and, • 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
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:

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. 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. Artificial ground is mapped along the northeastern boundary of the site, likely associated with the raised railway embankment in this area. 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. 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. 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. 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. The site is not located within a groundwater source protection zone (SPZ). According to the Envirocheck Report there are no licensed groundwater abstractions within 1 km of the site. 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. 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. 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. 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

	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. 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. 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. The following entries are recorded within 250 m of the site: • 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; • 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; • 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; • One area of Potentially Infilled Land (water) located approximately 100 m northeast of the site, mapped in 1938; and 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.

	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). 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. 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. Historical landfill in the northwest. 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]). The River Itchen and associated tributaries to the east. (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.

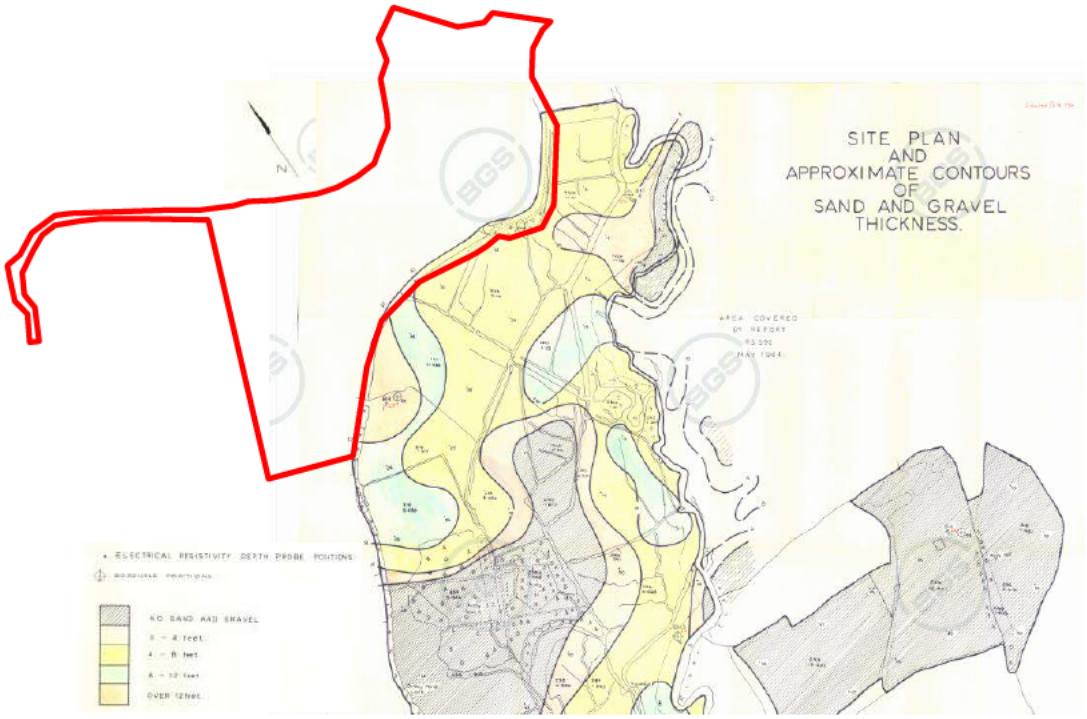


Figure C: Sand and Gravel Thickness Plan - 1964

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). Wells were installed with 50mm HDPE plastic pipe. ***Wells are to be monitored on six occasions on a monthly basis following completion of the ground investigation. At the time of this report the first two rounds of monitoring have been undertaken. Following completion of the monitoring an updated final report will be provided.***

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 - 5.22*	*9.08 - 9.71*	*N*	-
CP102	1.00 - 6.00	*4.17 - 4.88*	*9.05 - 9.76*	*N*	-
CP103	1.00 - 5.00	*2.96 - 3.70*	*9.16 - 9.90*	*N*	-
CP104	1.00 - 5.50	*3.02 - 3.60*	*9.03 - 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 CP102 = 1.4 CP103 = 1.9
Nickel	12	4	WFD2015	CP102 = 12 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 CP104 = 110
Aromatic >C12-C16	700	90	WHO 2008	CP103 = 700 CP104 = 290
Aromatic >C16-C21	1,000	90	WHO 2008	CP103 = 1,000 CP104 = 280
Total TPH	7,900	300	Geo^2	CP103 = 7,900 CP104 = 760
Notes: Geo^2 – Derived screening value based on professional experience. WHO 2008 – World Health Organisation Petroleum Products in Drinking Water 2008 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). The wells are scheduled for monitoring on a monthly basis for six months. ***To date, two monitoring visits have been completed. Once the monitoring programme has been completed, the risk assessment will be updated.***

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.

Monitoring data obtained from the two 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	*<0.1*	*<0.1*	*CS1*	*6.0*	*CS1*	*N*	-
CP102	1.00 - 6.00	*0.2*	*<0.1*	*CS1*	*6.6*	*CS1*	*N*	-
CP103	1.00 - 5.00	*0.3*	*<0.1*	*CS1*	*4.8*	*CS1*	*N*	-
CP104	1.0 5.50	*<0.1*	*<0.1*	*CS1*	*6.1*	*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 6.6% v/v within CP104. 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. This threshold has been marginally exceeded within CP101, CP102 and CP104. To date, the steady flow has been recorded as negligible 0.3 l/hr or less, as such, the elevated concentrations were not associated with significantly elevated flow rates. Furthermore, the elevated carbon dioxide was accompanied by reduced oxygen concentrations, indicative of gas generation due to microbial activity on organic material.

7.5 Mitigation of Ground Gas Risk

The ground gas regime will be assessed upon completion of the monitoring.

7.6 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 records groundwater between 2.96 m bgl to 4.88 m bgl (9.03 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, γ_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 records groundwater between 2.96 m bgl to 4.88 m bgl (9.03 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

Extremely Unlikely	1

Minor	1

		consider improvements.
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. 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. 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. 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. 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. No evidence of volatile contamination has been identified associated with the northern highway area. 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]). 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. 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. No evidence of volatile contamination has been identified. 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)**	***Ground gas risk to be updated upon completion of the monitoring regime.*** 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.

The risk from ground gas will be assessed following completion of the monitoring regime.

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 records groundwater between 2.96 m bgl to 4.88 m bgl (9.03 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.

11.0 Limitations

This Report was prepared by Geo^2 for the sole and exclusive use of the Client and for the specific purpose for which Geo^2 was instructed. Unless explicitly agreed otherwise, in writing, this Report has been prepared under Geo^2's Standard Terms and Conditions.

Geo^2 does not intend, without its written consent through a formal letter of reliance or warranty, for this Report to be disseminated to any party other than the named Client or to be used or relied upon by any party other than the named Client. Use of the Report by any other party is unauthorised and such use is at the sole risk of the user. Any party using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Geo^2 from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by Geo^2.

The recommendations contained within this Report represent Geo^2's professional opinions, based upon the information detailed within the Report, exercising the reasonable skill and care to be expected of a professional consultant holding itself out as having the competence, experience, and resources necessary for the purpose of carrying out similar work in scope and character to the services performed. The Report needs to be considered in the light of the proposal and associated limitations of scope. The Report needs to be read and considered in full and isolated sections cannot be used without full reference to other elements of the Report and any previous works referenced within the Report.

12.0 References

British Standards Institute

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British Geological Society

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Screening Assessment

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Society of Brownfield Risk Assessment "Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater", dated September 2024 (Version 2.0).

Appendix A – Drawings and Figures



Site Boundary

Site Location

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

N

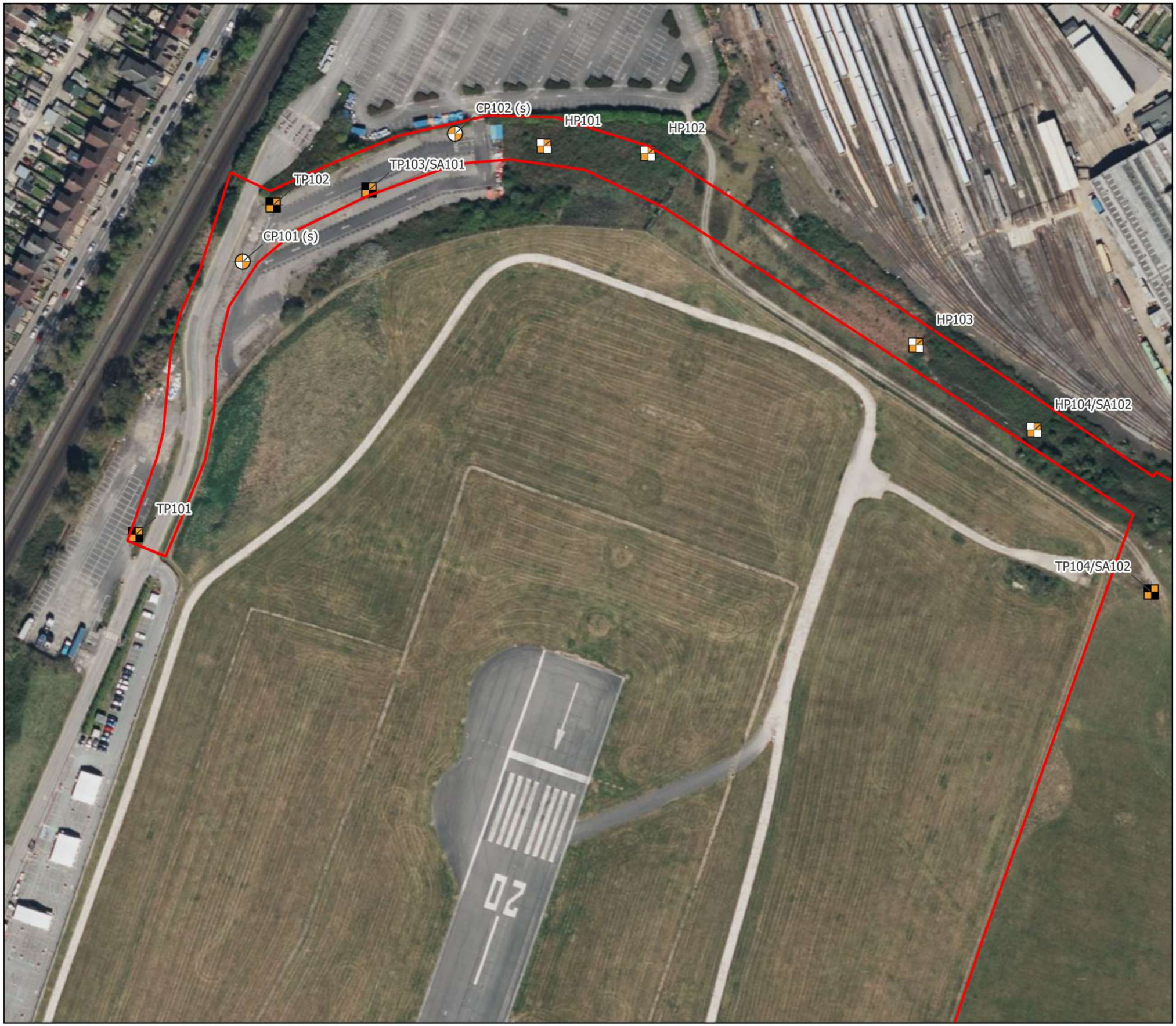
DO NOT SCALE. NOT FOR CONSTRUCTION

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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		

Geo2

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Legend

Site Boundary

SI Locations

CP - Cable Percussion Borehole
(s) - Standpipe Installation

TP - Trial Pit

HP - Hand Dug Pit

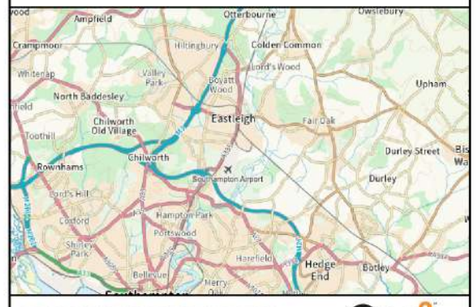
0 10 20 30 40 50 m

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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Geo2

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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

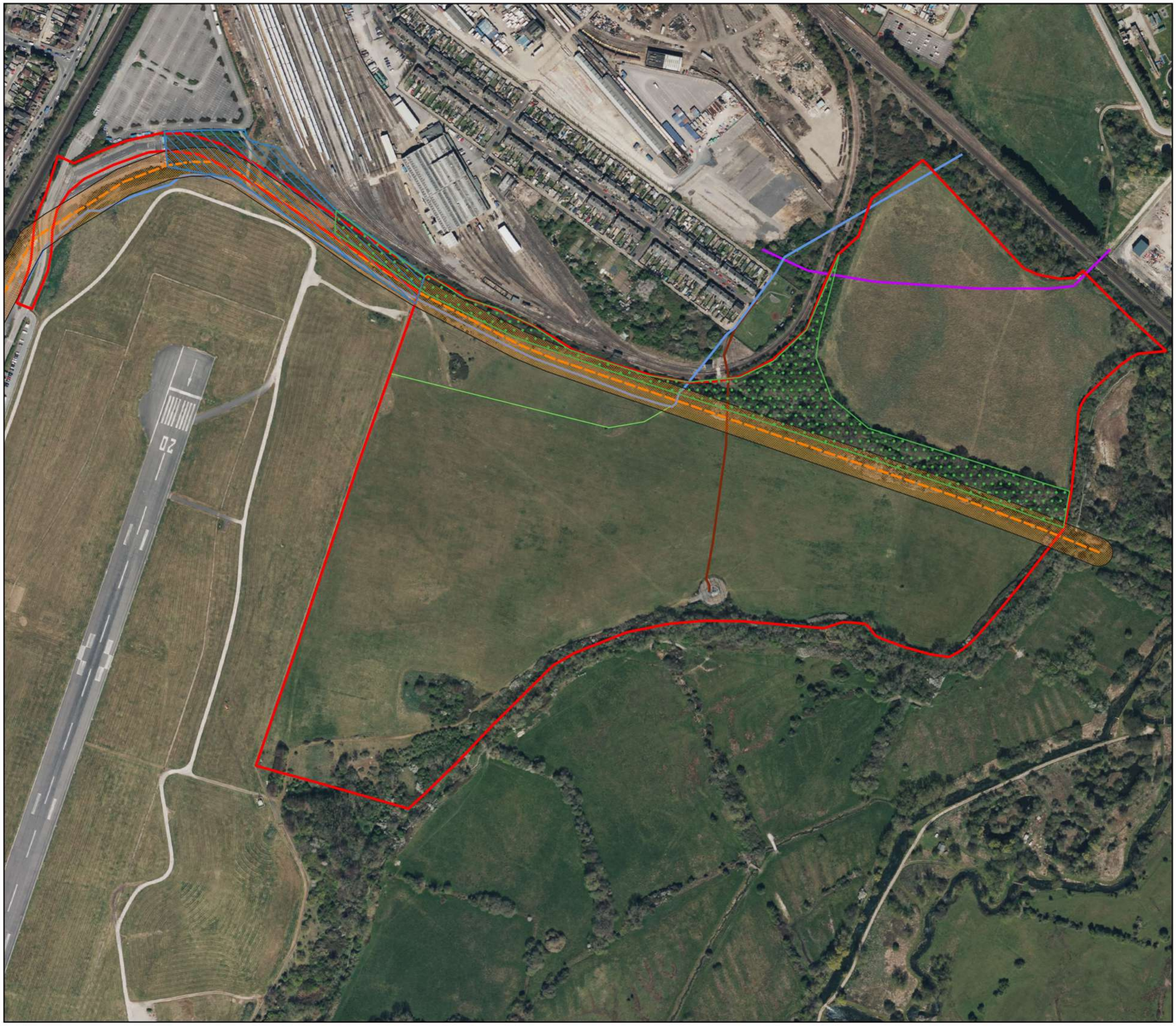
Figure: Intrusive Location Plan		
Job: Navigator Quarter, Southampton		
Client: Blocwork (Eastleigh) LLP and AGS Airports Group Limited		
Figure No.: 2B	Revision: 1	Date: 07 February 2025
Drawn by: JCR	Checked by: TH	Scale: 1:3,000
Job No.: 4362		



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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

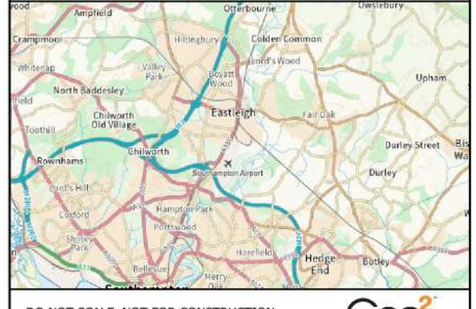
0 30 60 90 120 150 m

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

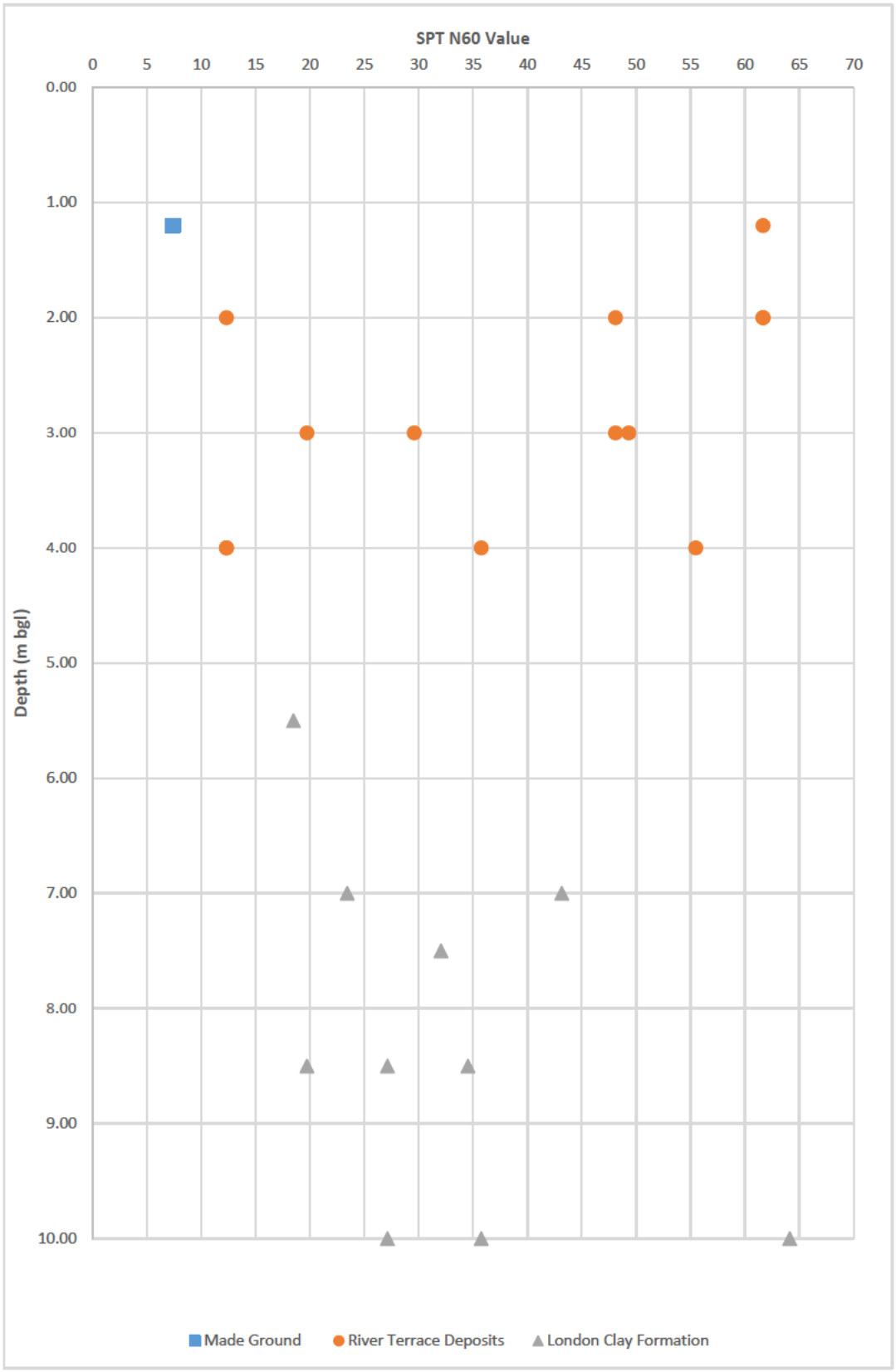


DO NOT SCALE. NOT FOR CONSTRUCTION

Geo2

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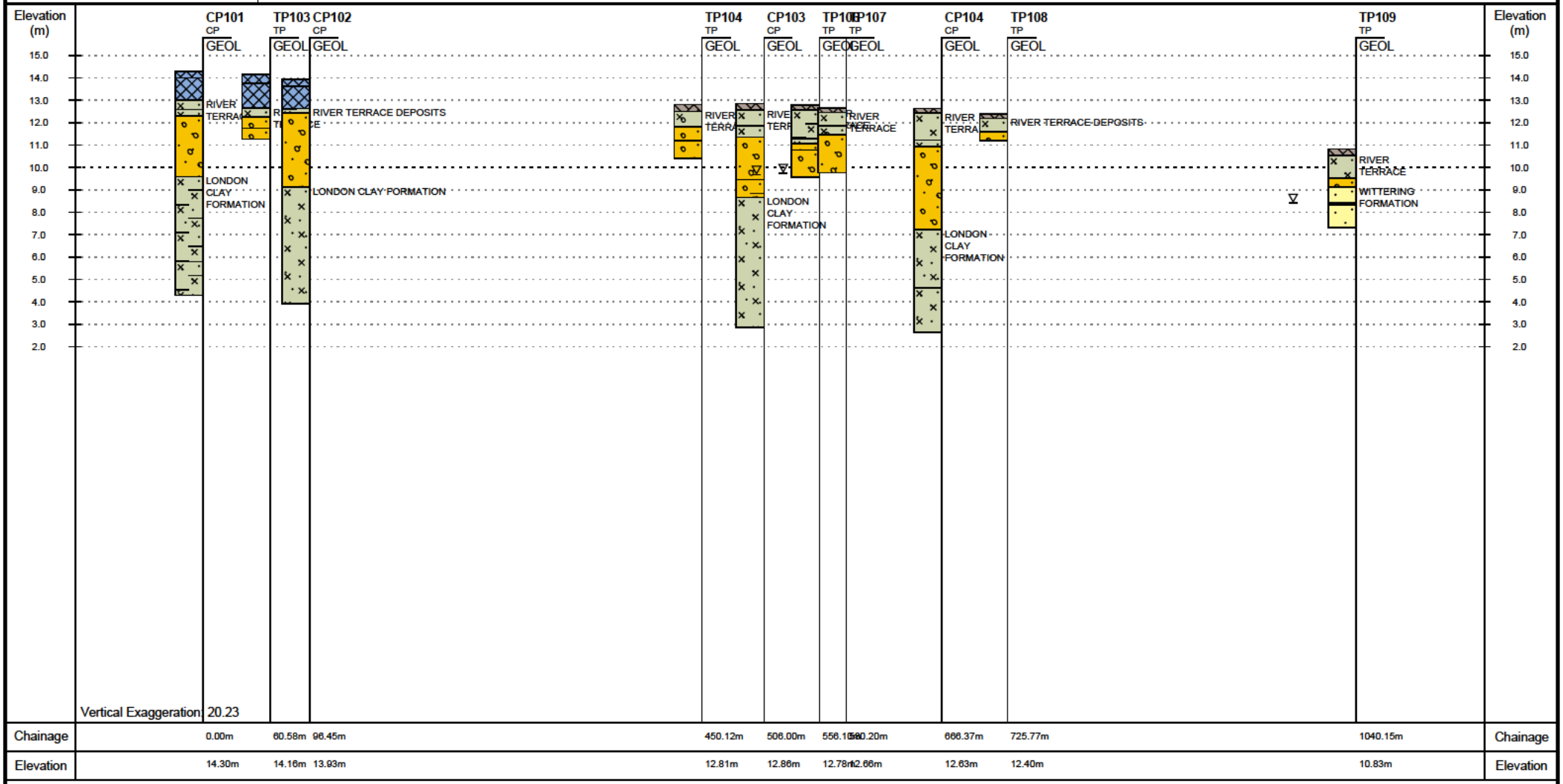


Geo2™	TITLE: Corrected SPT N_{60} Values vs Depth Plot (m bgl) Navigator Quarter	DWN: JCR	PROJECT NO.: 4362
		DATE: 21.03.2025	Figure: 4

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 0.20 - 0.30	ES 1 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]
					11.84	2.50		
		2.60 - 2.80	B 2					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	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
						(0.40)		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		MADE GROUND: Grey slightly sandy SILT. Sand is fine to medium. Rare angular to sub-rounded fine to medium brick and quartzite gravel.
						(1.10)		
		1.20 - 1.30	ES 1					
					12.66	1.50		Light brown slightly sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS]
						(0.40)		
					12.26	1.90		Light brown slightly clayey sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]
						(0.50)		
					11.76	2.40		Light greyish brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]
		2.70 - 2.90	B 1			(0.50)		
					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

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	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	ES 1		12.51	(0.30) 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.
		0.60 - 0.80	B 1			(0.70)		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 - 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]
		2.00 - 2.20	B 3		11.21	(0.60) 1.60		Light greyish brown sandy angular to sub-rounded fine to coarse quartzite GRAVEL. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]
					10.41	(0.80) 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

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*

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	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
		0.10 - 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

Created using Pebble Geo

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

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

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
					10.15	(0.20) 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.
		0.50 - 0.60	ES 1			(0.50)		MADE GROUND: Light brown slightly clayey sandy angular to sub-angular fine to coarse quartzite and brick GRAVEL. Sand is fine to coarse.
					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]
		1.80 - 2.90	B 1		8.55	(1.10) 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]
		2.30 - 2.40	B 2		8.05	(0.50) 2.30		Greenish grey very sandy SILT. Sand is fine to medium. [WITTERING FORMATION]
	▽	3.50 - 3.60	B 3		6.85	(1.20) 3.50		Bluish grey fine to medium SAND. [WITTERING FORMATION]
					6.75	(0.10) 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
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 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		
		0.50 - 0.60	ES 1					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 - 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

Created using Pebble Geo

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

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)		
		1.20	SPT	N=50 for 235mm (1,2/2,3,3,4 for 10mm)	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 - 1.65	D			(0.50)		
		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]
		4.00	SPT	N=10 (3,4/3,2,2,3)		(0.80)		
		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*

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

Created using Pebble Geo

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*

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 = 0.30m

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*

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 = 0.30m

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

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	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
								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.
		0.40 - 0.60	B 1			(1.10)		
		0.70 - 0.75	ES 1					
		1.10 - 1.15	ES 2		11.75	1.10 (0.10)		Orangish brown slightly clayey sandy SILT. Sand is fine to medium. [RIVER TERRACE DEPOSITS]
					11.65	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 = 0.40m

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			(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.
					12.15	0.15		Orangish brown slightly clayey sandy SILT. Sand is fine to medium [RIVER TERRACE DEPOSITS]
		0.80 - 1.00	B 1			(1.05)		
					11.10	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 = 0.35m

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	Rising	
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.) $ For **Depth to water** state **Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)** # For Depth to Product state **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.

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)	31/02/2025		
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	
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)	NR	NR
Wind Dir. (From)	NR	NR
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.) $ For **Depth to water** state **Depth to water or Dry or NR (= Not Recorded - provide reason if monitoring was intended)** # **For Depth to Product state** **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	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	

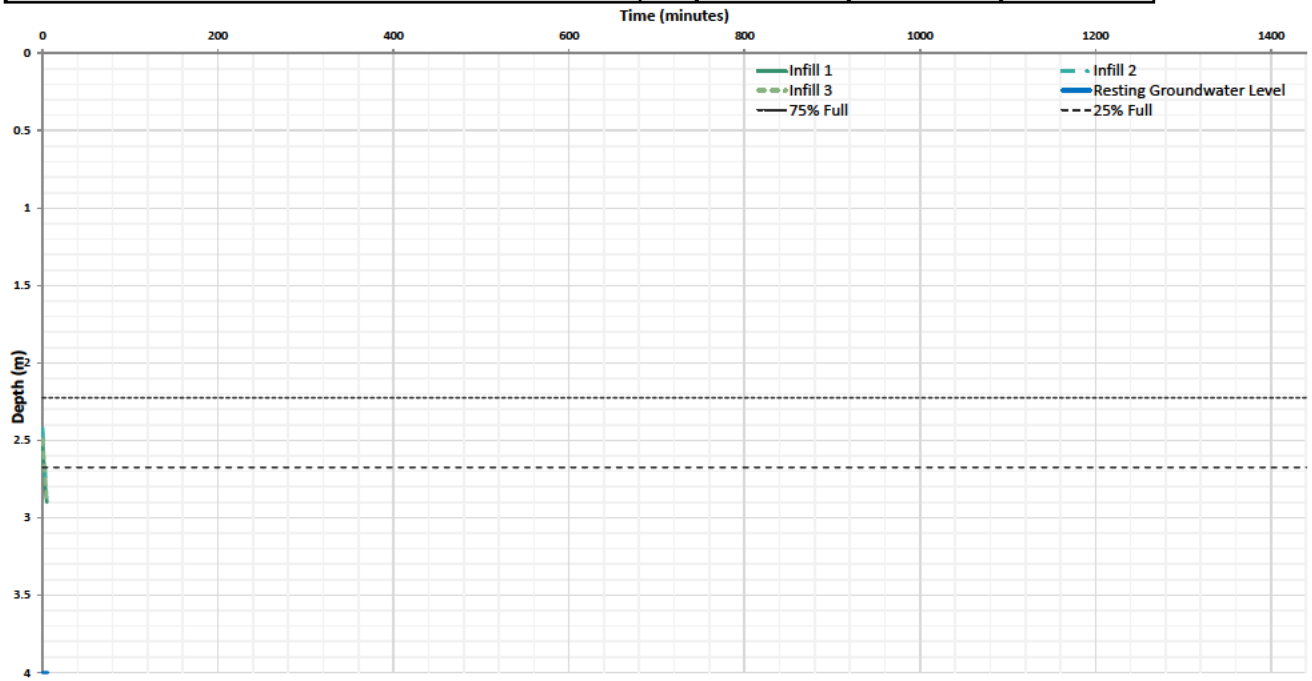
Version	1.2	Issue Date	18/06/2024

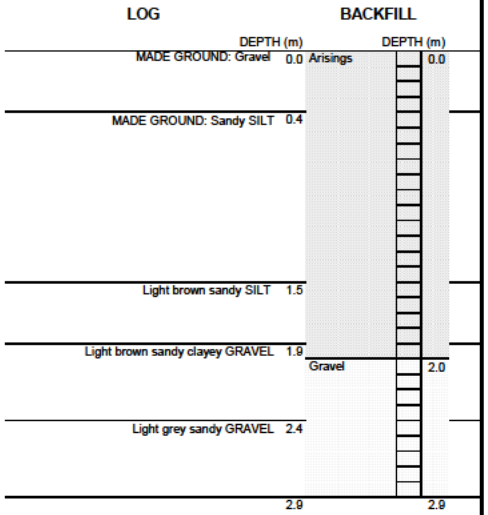
	units	Infill 1	Infill 2	Infill 3
Length	m		1.70	
Width	m		0.60	
Depth	m		2.90	
Gravel type			20mm single size	
Voids ratio			0.40	
Resting groundwater level at time of testing	m		4.00	
Depth of first reading	m	2.48	2.42	2.49
Depth of final reading	m	2.90	2.90	2.90
Did soakage test reach 25% of maximum 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.





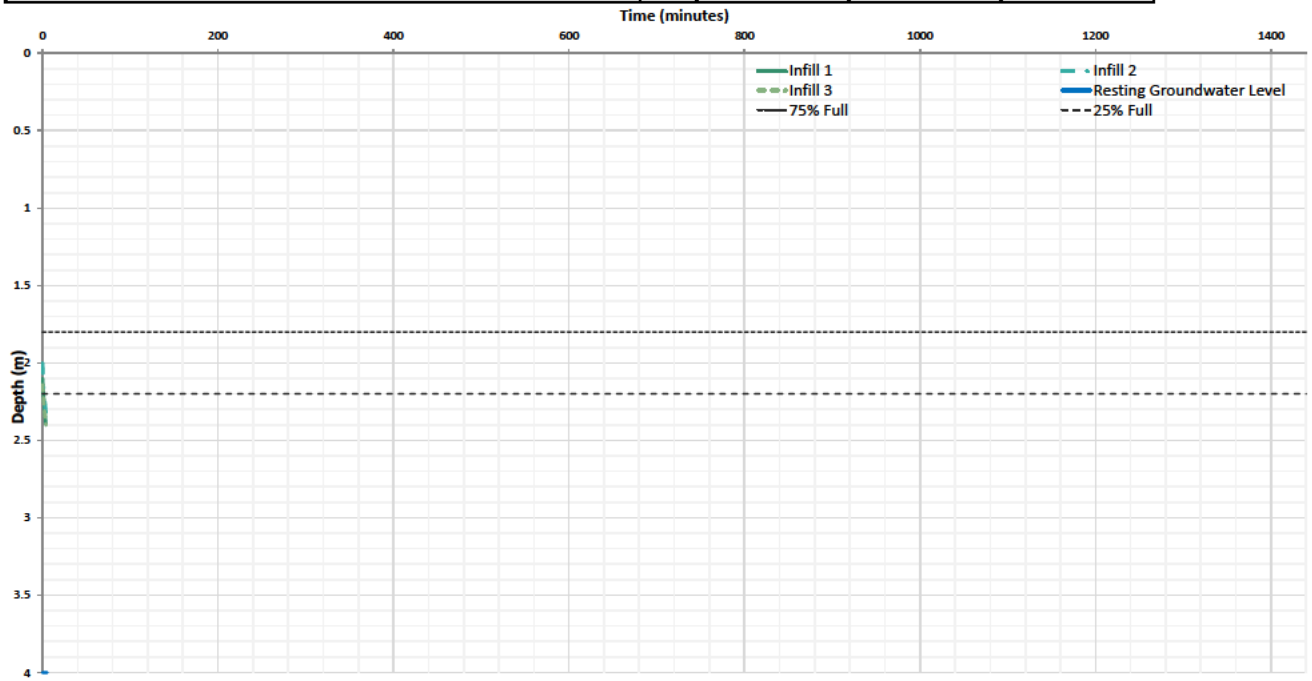
TITLE: Soakaway Test Results Navigator Quarter, Southampton Blocwork (Eastleigh) LLP and AGS Airports Limited	*In accordance with BRE Digest 365 (2016)*	DRAWN BY: JCR CHECKED BY: TH DATE: 04/02/2025	SCALE: Not to Scale REVISION: 1	PROJECT NUMBER: 4362 SOAKAWAY NUMBER: TP103/SA101

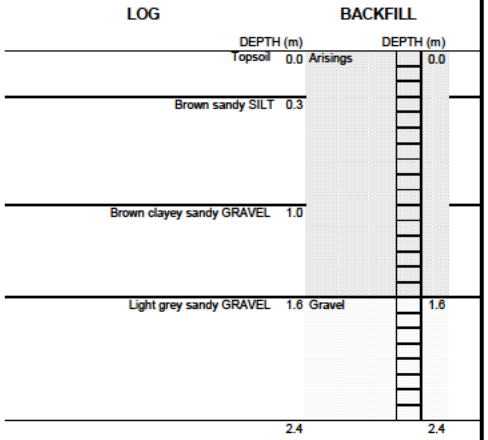
	units	Infill 1	Infill 2	Infill 3
Length	m		1.60	
Width	m		0.60	
Depth	m		2.40	
Gravel type			20mm single size	
Voids ratio			0.40	
Resting groundwater level at time of testing	m		4.00	
Depth of first reading	m	2.10	2.00	2.14
Depth of final reading	m	2.40	2.40	2.40
Did soakage test reach 25% of maximum 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)

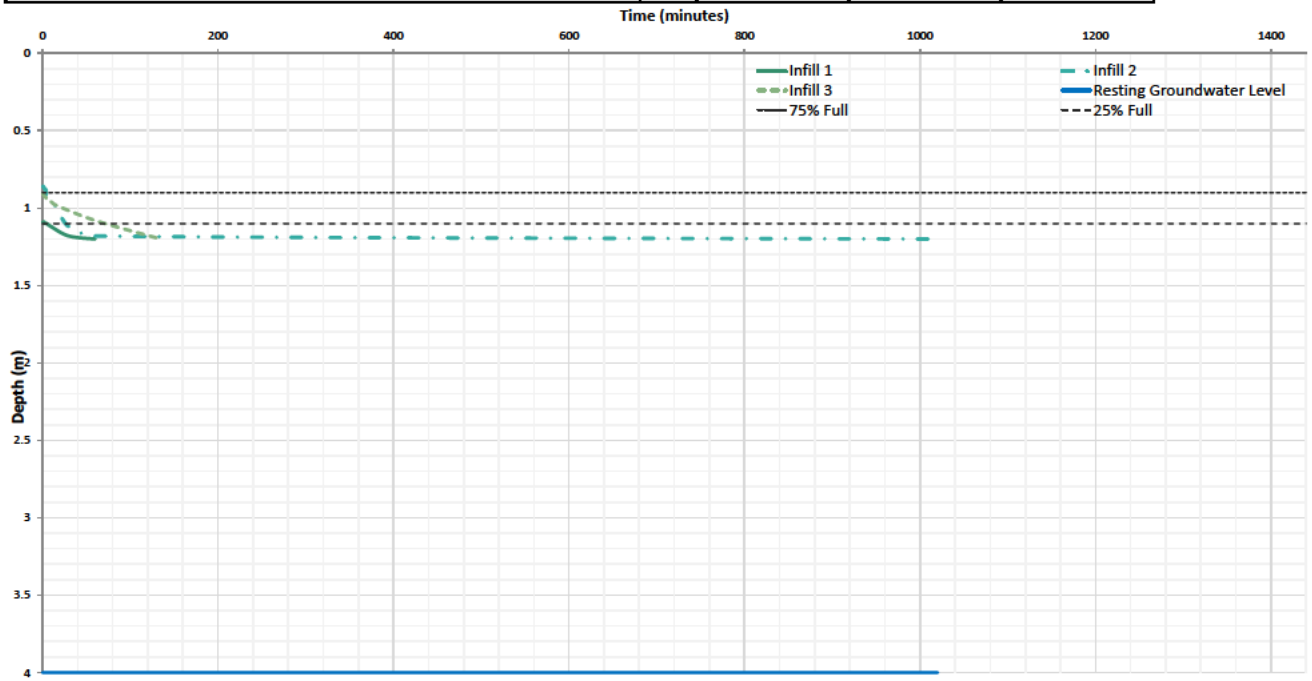
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CHECKED BY: TH	REVISION: 1	SOAKAWAY NUMBER: TP104/SA102
DATE: 04/02/2025		

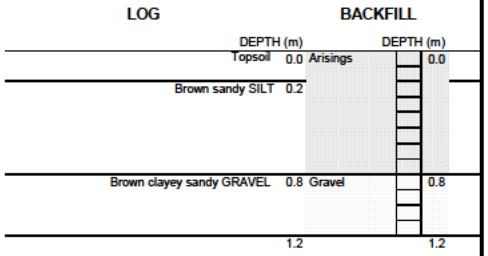
	units	Infill 1	Infill 2	Infill 3
Length	m		1.80	
Width	m		0.60	
Depth	m		1.20	
Gravel type			20mm single size	
Voids ratio			0.40	
Resting groundwater level at time of testing	m		4.00	
Depth of first reading	m	1.09	0.86	0.91
Depth of final reading	m	1.20	1.20	1.20
Did soakage test reach 25% of maximum 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		

Signed: [redacted]

Caterina
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

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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

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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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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	8:1		Cumulative 10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
	mg/l	mg/l		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)

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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)

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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

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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		

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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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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				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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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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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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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				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

4041

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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: [redacted]

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

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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: 25-009438
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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The results included within the report relate only to the sample(s) submitted for testing.

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

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

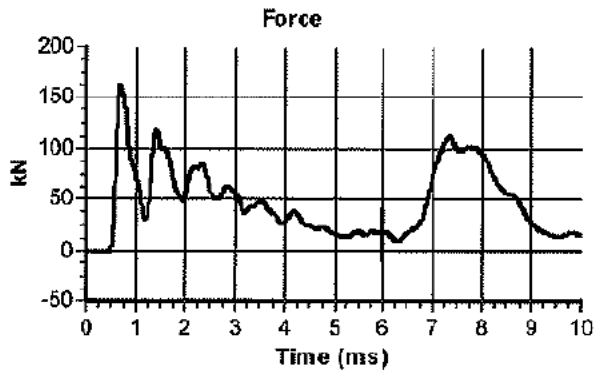
Instrumented Rod Data

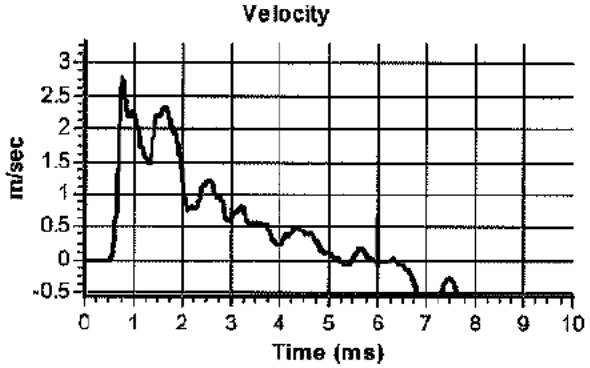
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.6
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	64786
Accelerometer No.2:	64789

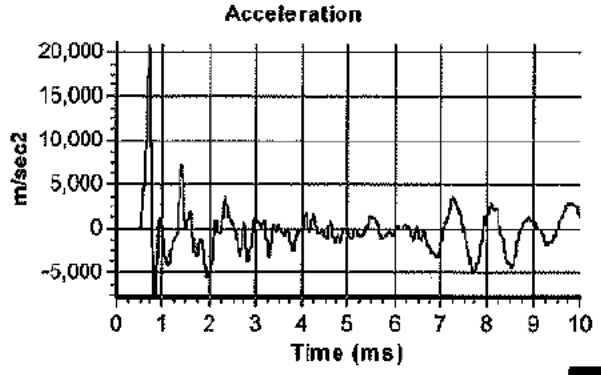
SPT Hammer Information

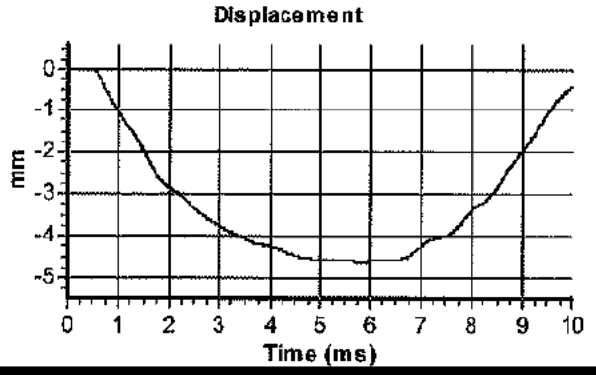
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	14.7

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]

Title: Technician

The recommended calibration interval is 12 months

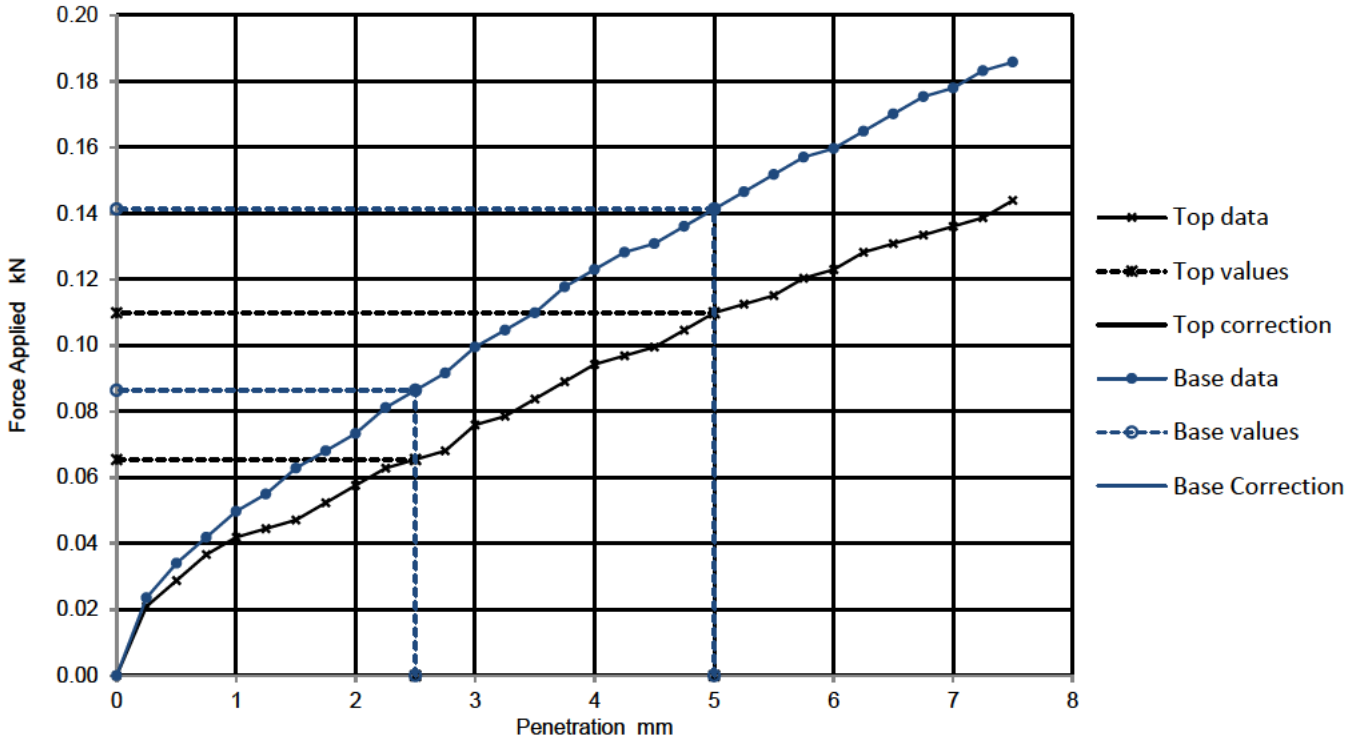
SPTMAN ver.1.92 All rights reserved, Testconsult ©2010

GQF-008-36 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

UKAS TESTING
7758

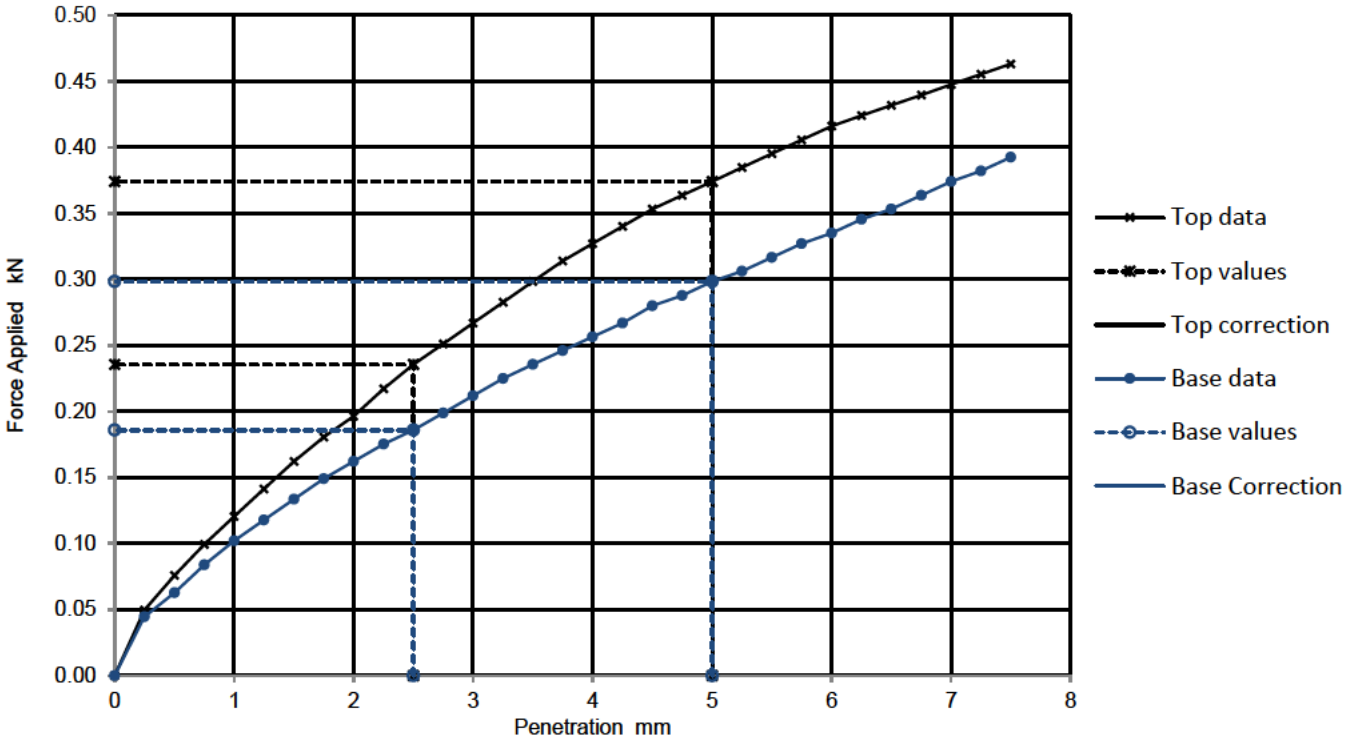
CBR

GQF-008-36 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

UKAS TESTING 7758

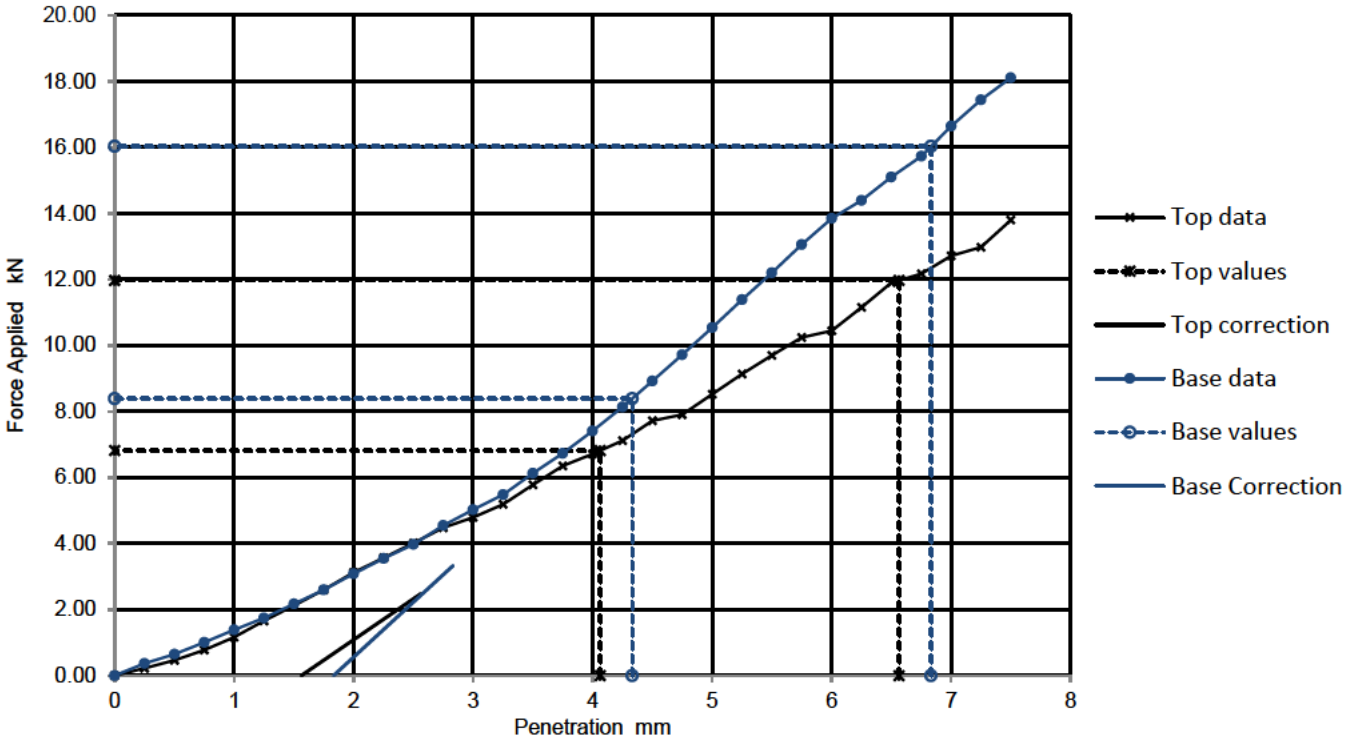
CBR

GQF-008-36 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

UKAS TESTING
7758

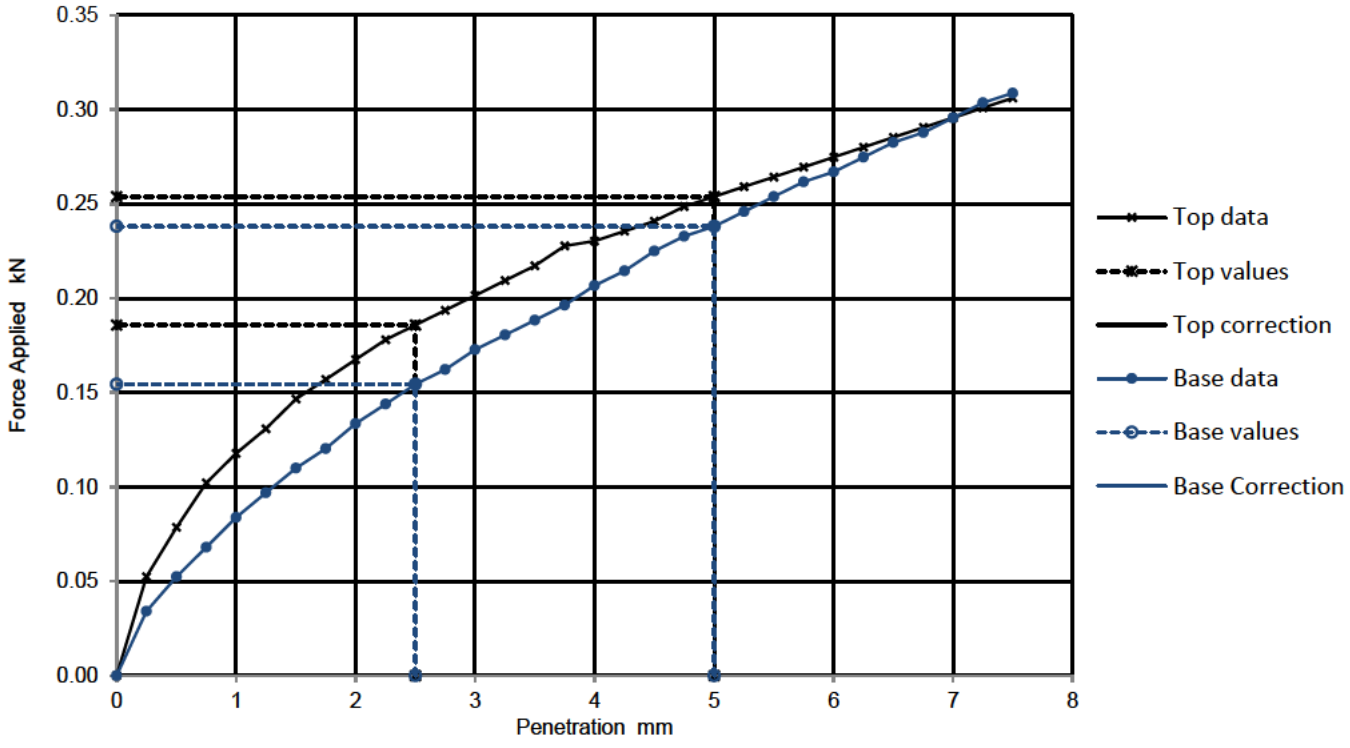
CBR

GQF-008-36 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

UKAS TESTING 7758

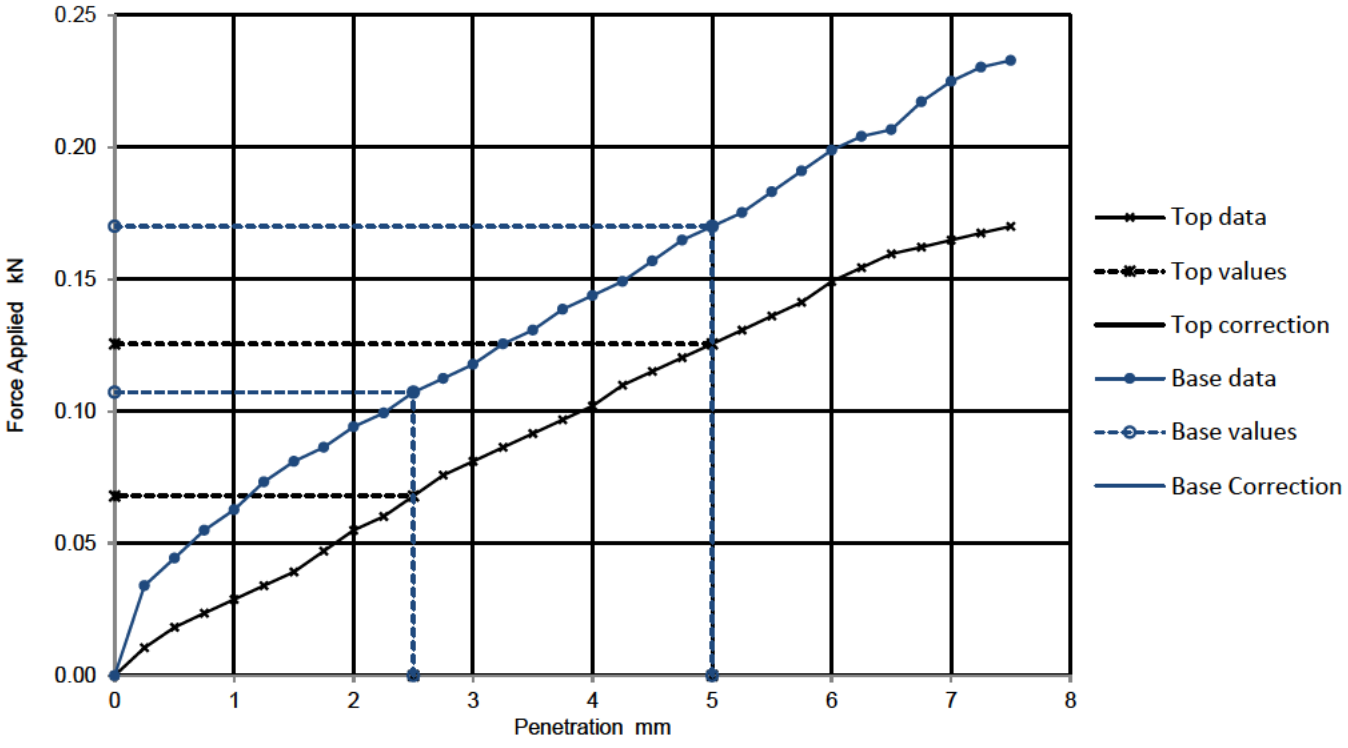
CBR

GQF-008-36 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

UKAS TESTING 7758

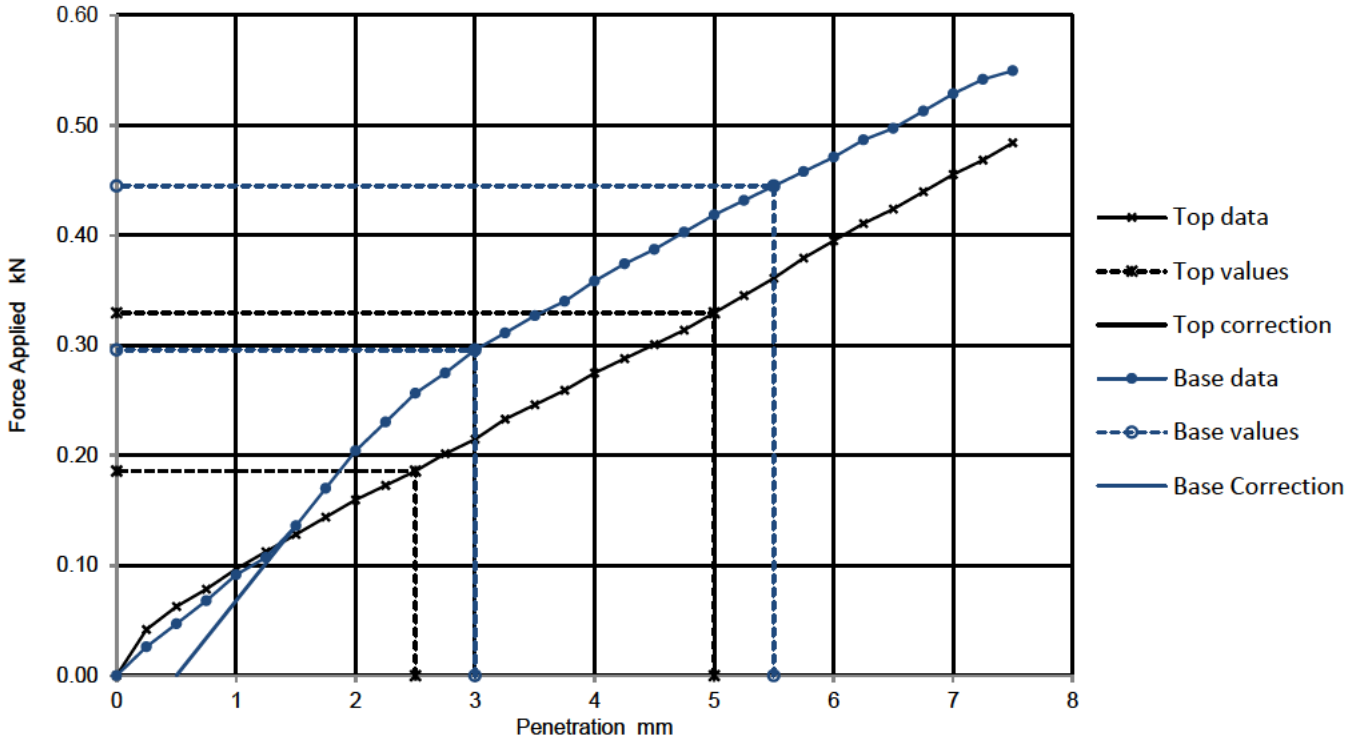
CBR

GQF-008-36 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

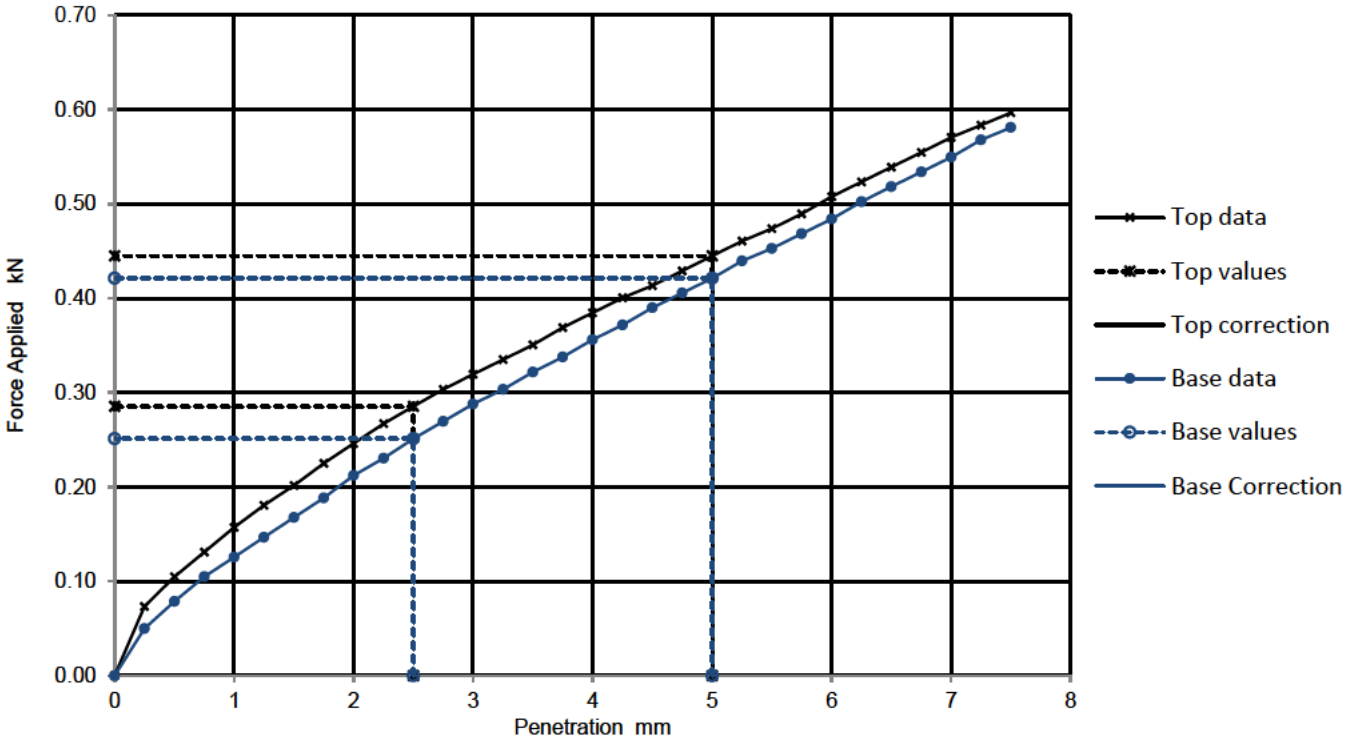
CBR

GQF-008-36 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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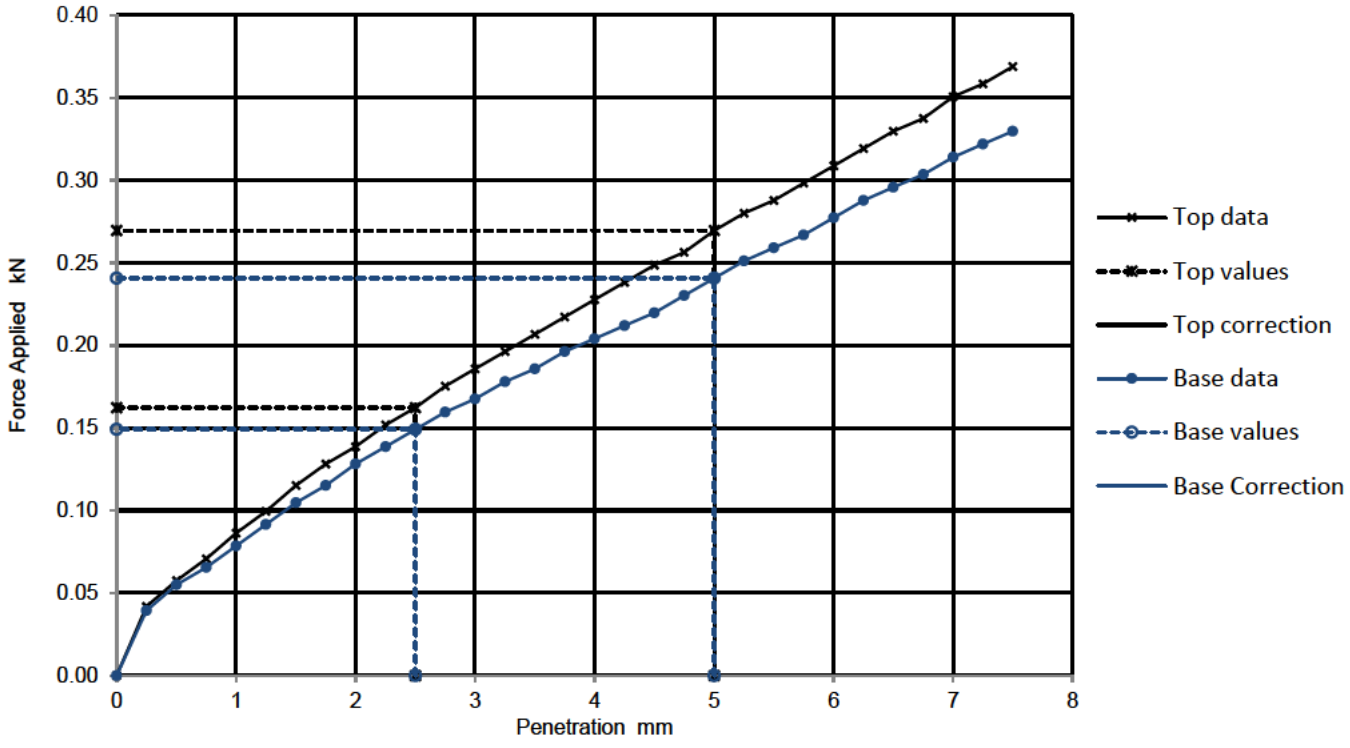
CBR

GQF-008-36 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

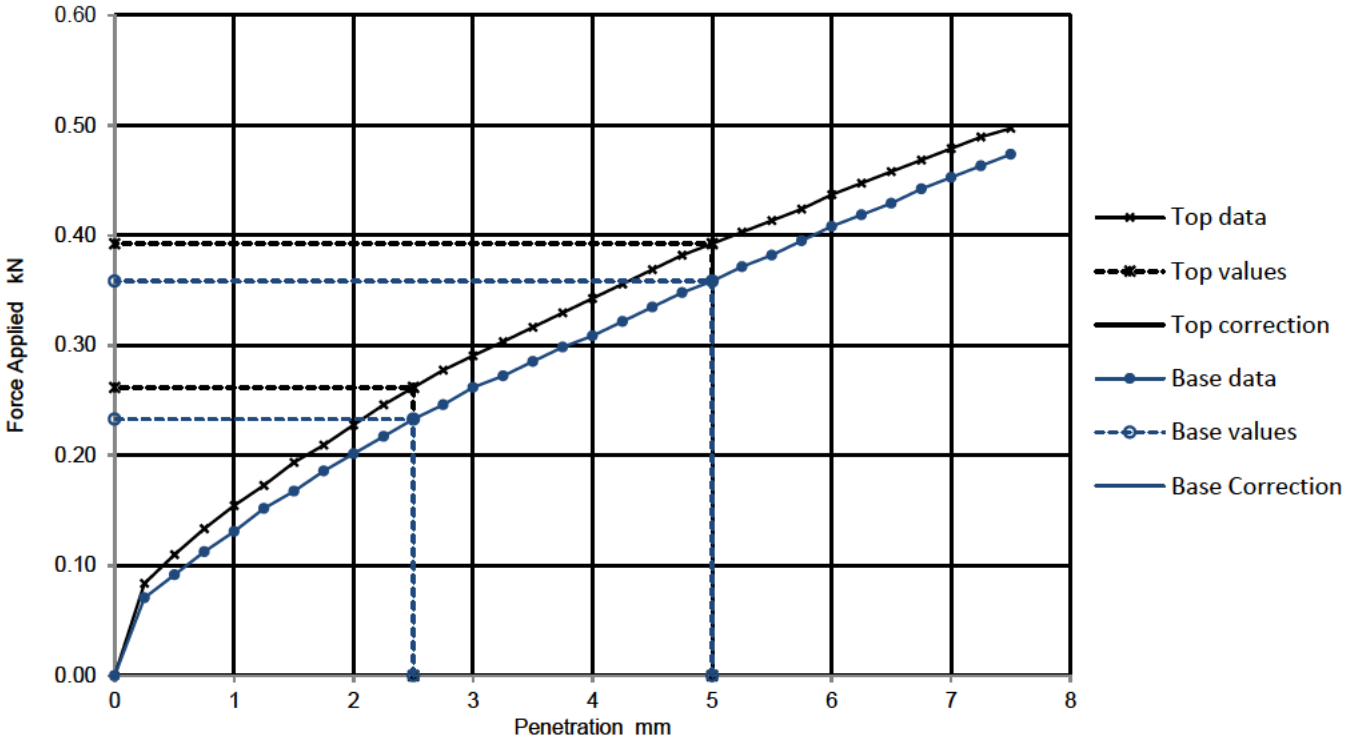
CBR

GQF-008-36 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

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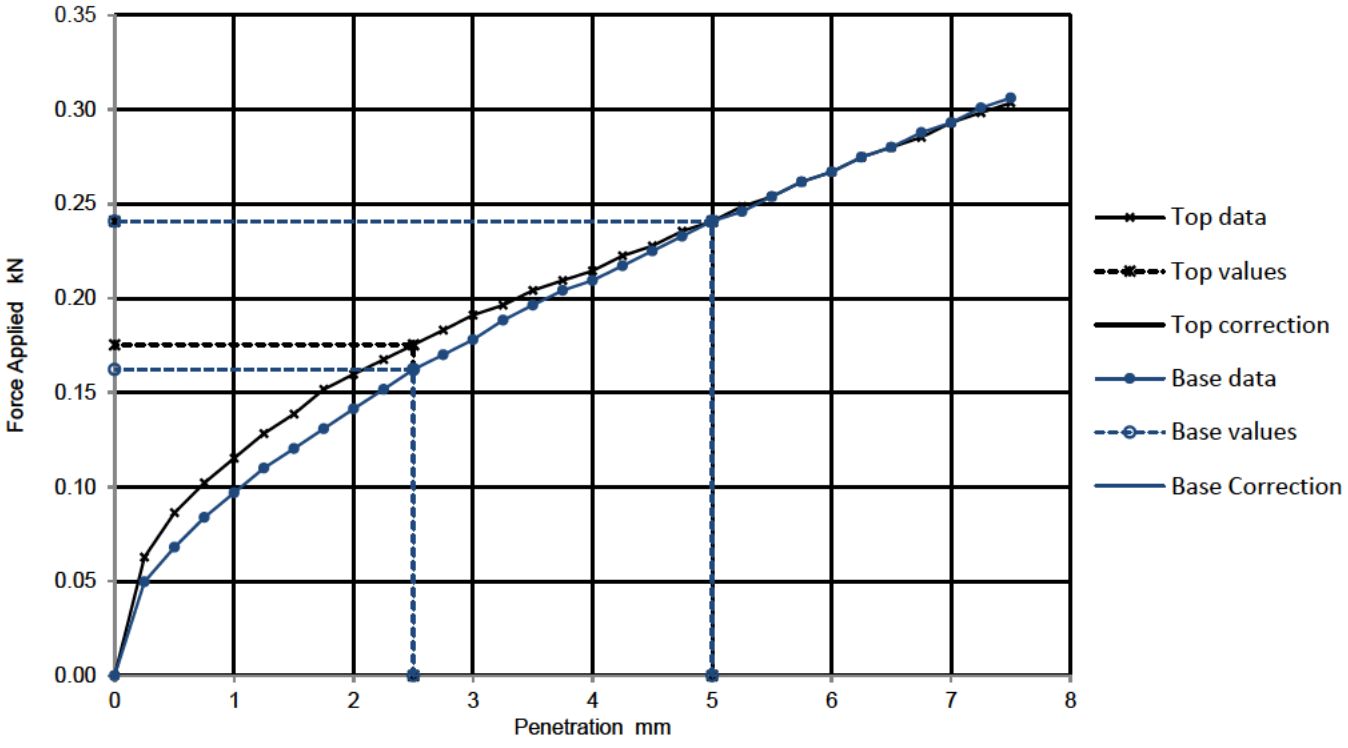
CBR

GQF-008-36 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, % 2.5mm	5mm	Highest	Average	Moisture Content %
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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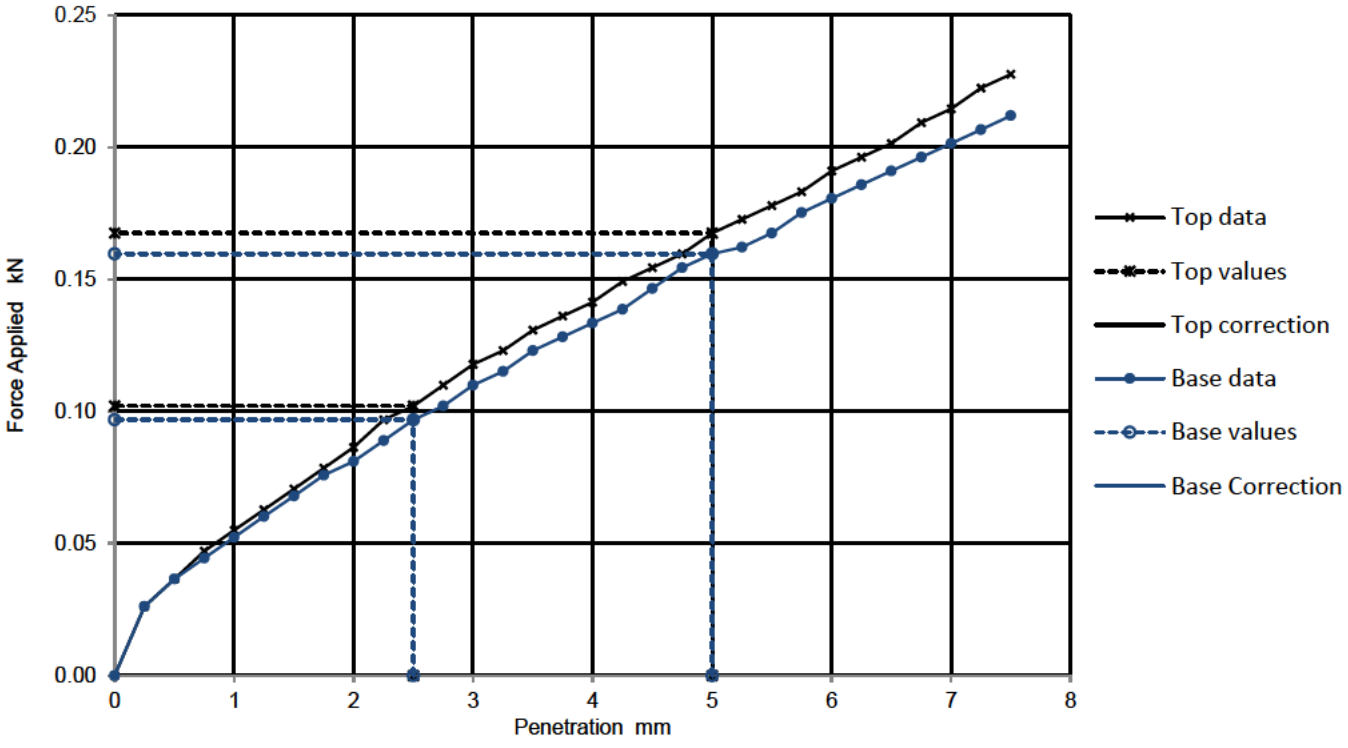
CBR

GQF-008-36 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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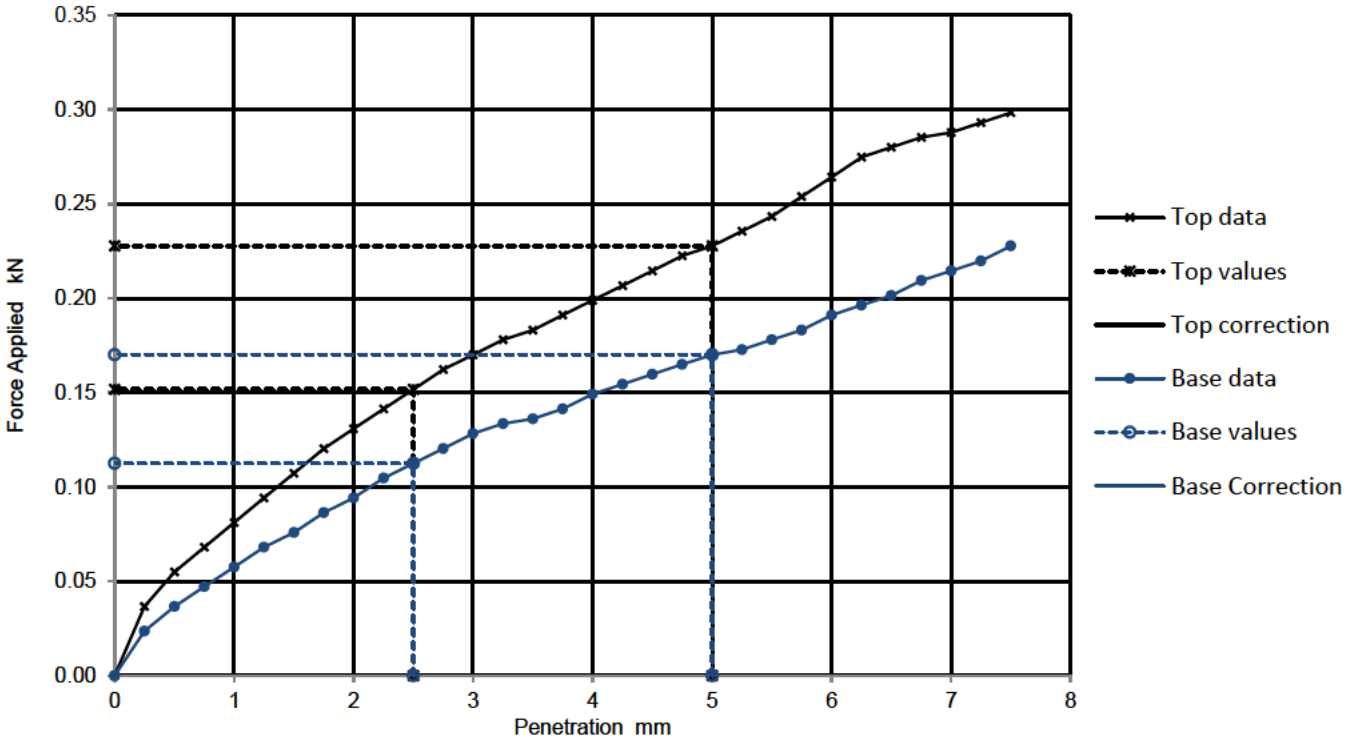
CBR

GQF-008-36 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									

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

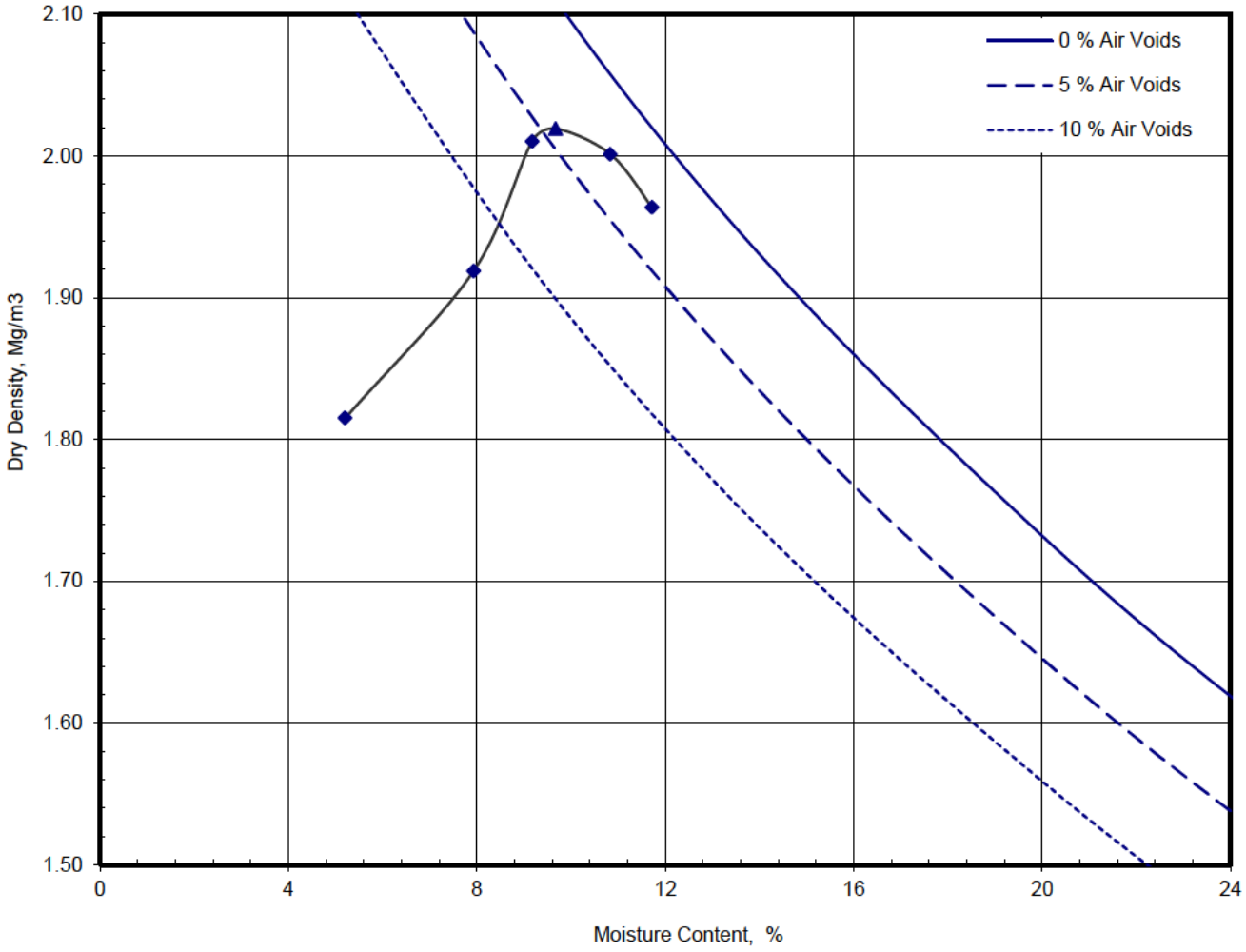
Test Standards:

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 Issue 02 - June 24	**Dry Density / Moisture Content Relationship 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**

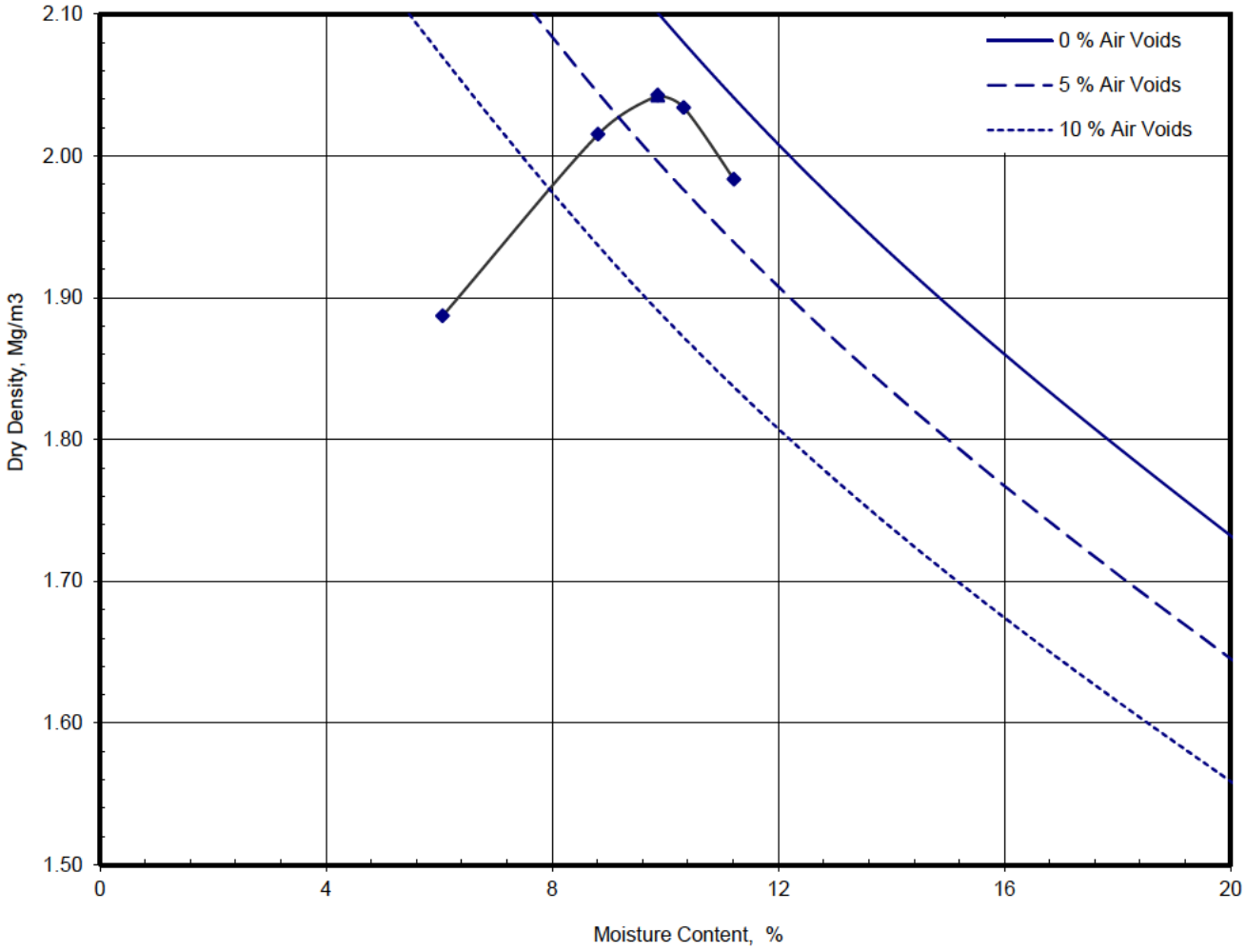
7758

Remarks

Date Printed 03/03/2025

COMPL

GQF-008-50 Issue 02 - June 24	**Dry Density / Moisture Content Relationship 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

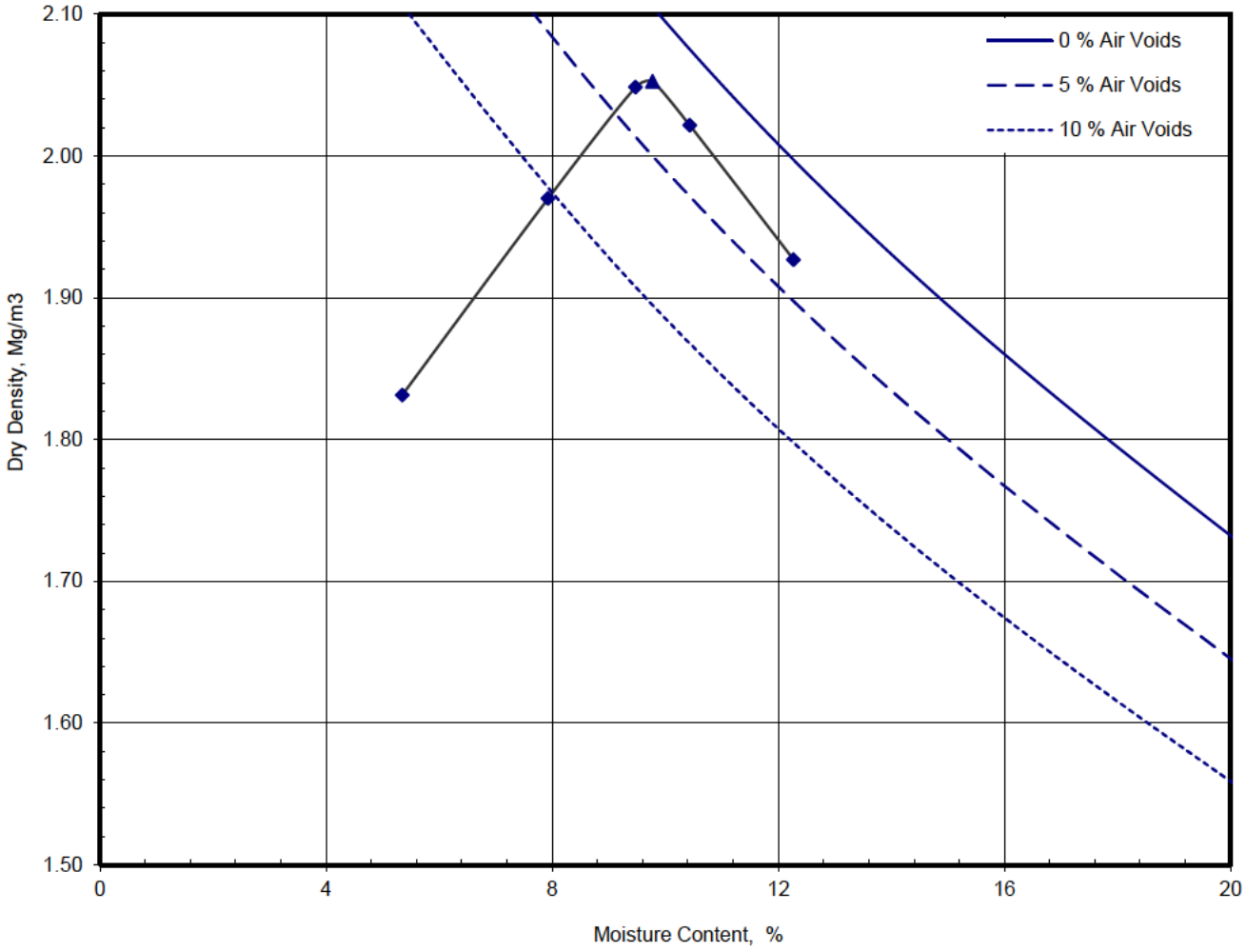


Preparation		Material used was natural
Mould Type		CBR
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	5
Material Retained on 20.0 mm Sieve	%	27
Particle Density - Assumed	Mg/m³	2.65

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

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

GQF-008-50 Issue 02 - June 24	**Dry Density / Moisture Content Relationship 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

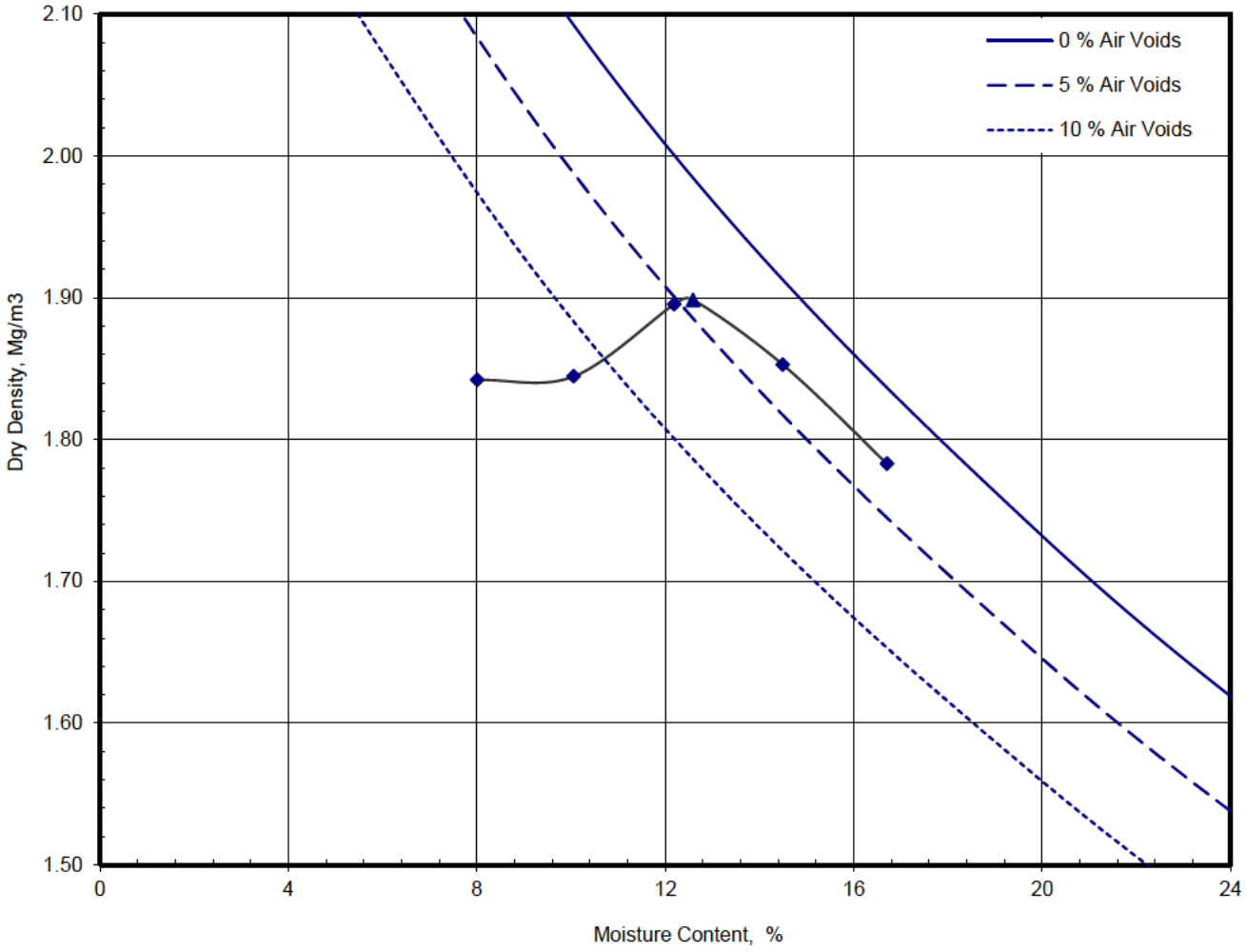


Preparation		Material used was natural
Mould Type		CBR
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	16
Material Retained on 20.0 mm Sieve	%	37
Particle Density - Assumed	Mg/m³	2.65

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

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

GQF-008-50 Issue 02 - June 24	**Dry Density / Moisture Content Relationship 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

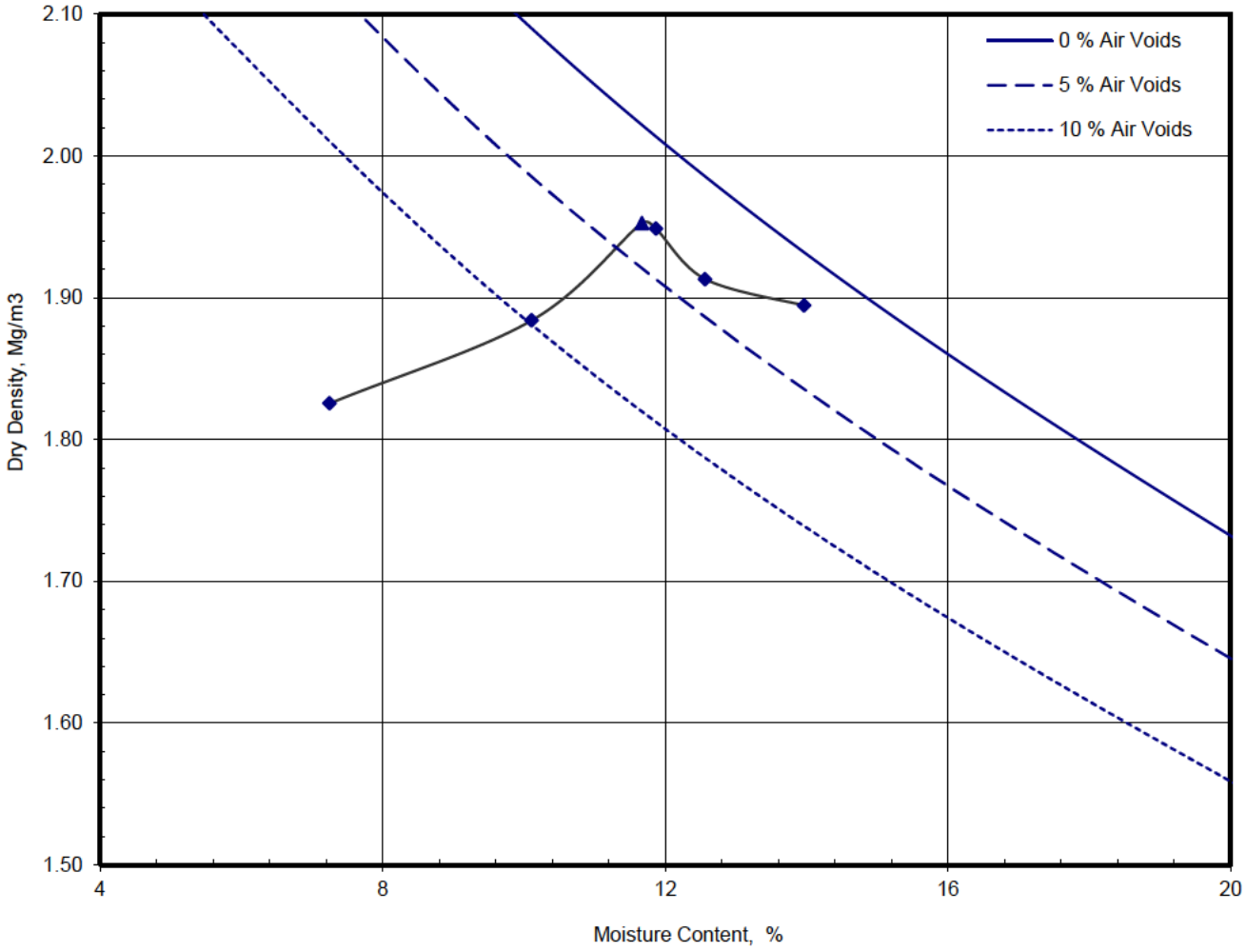


Preparation		Material used was natural
Mould Type		CBR
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	6
Material Retained on 20.0 mm Sieve	%	25
Particle Density - Assumed	Mg/m³	2.65

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

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

GQF-008-50 Issue 02 - June 24	**Dry Density / Moisture Content Relationship 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

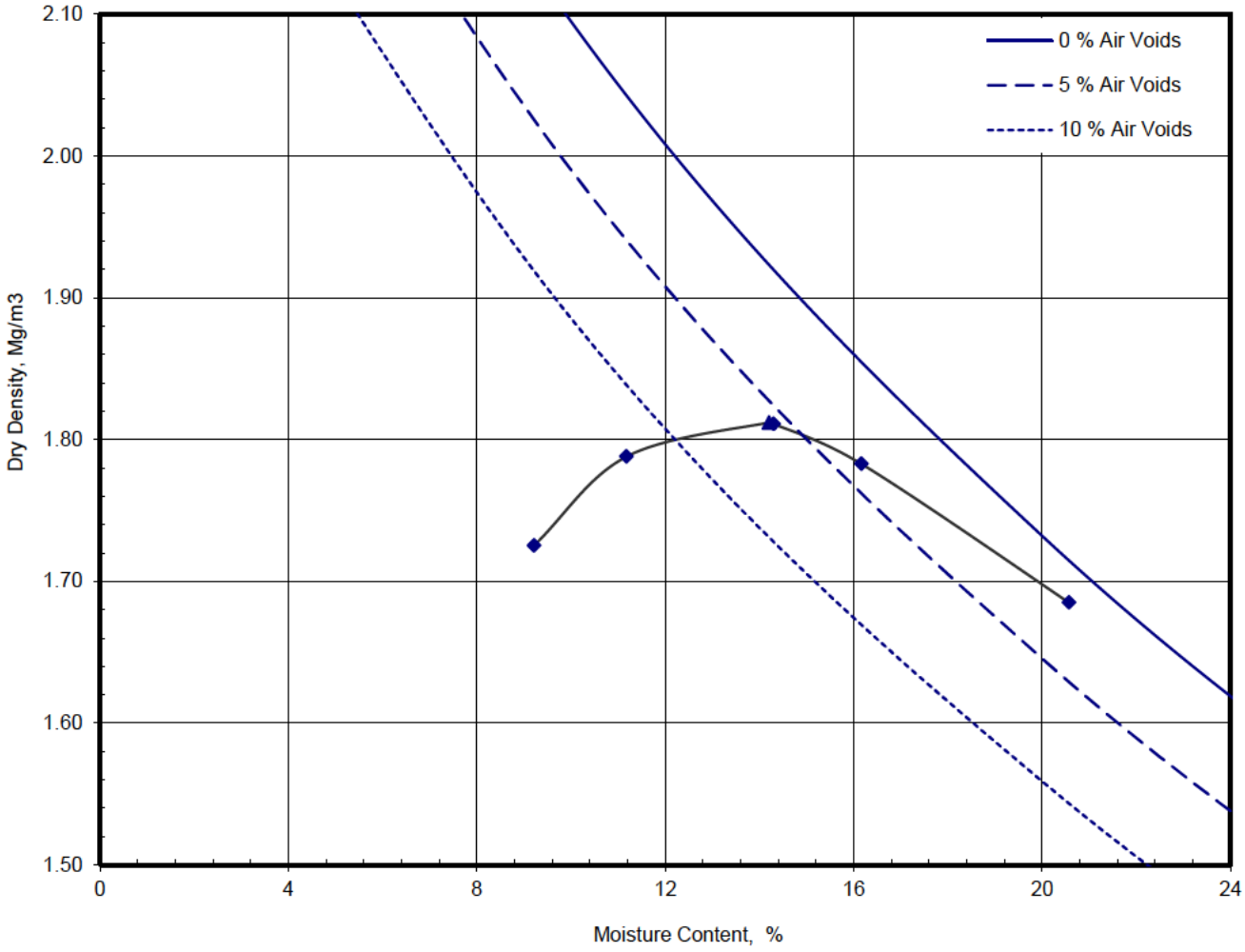


Preparation		Material used was natural
Mould Type		CBR
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	7
Material Retained on 20.0 mm Sieve	%	33
Particle Density - Assumed	Mg/m³	2.65

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

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

GQF-008-50 Issue 02 - June 24	**Dry Density / Moisture Content Relationship 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**

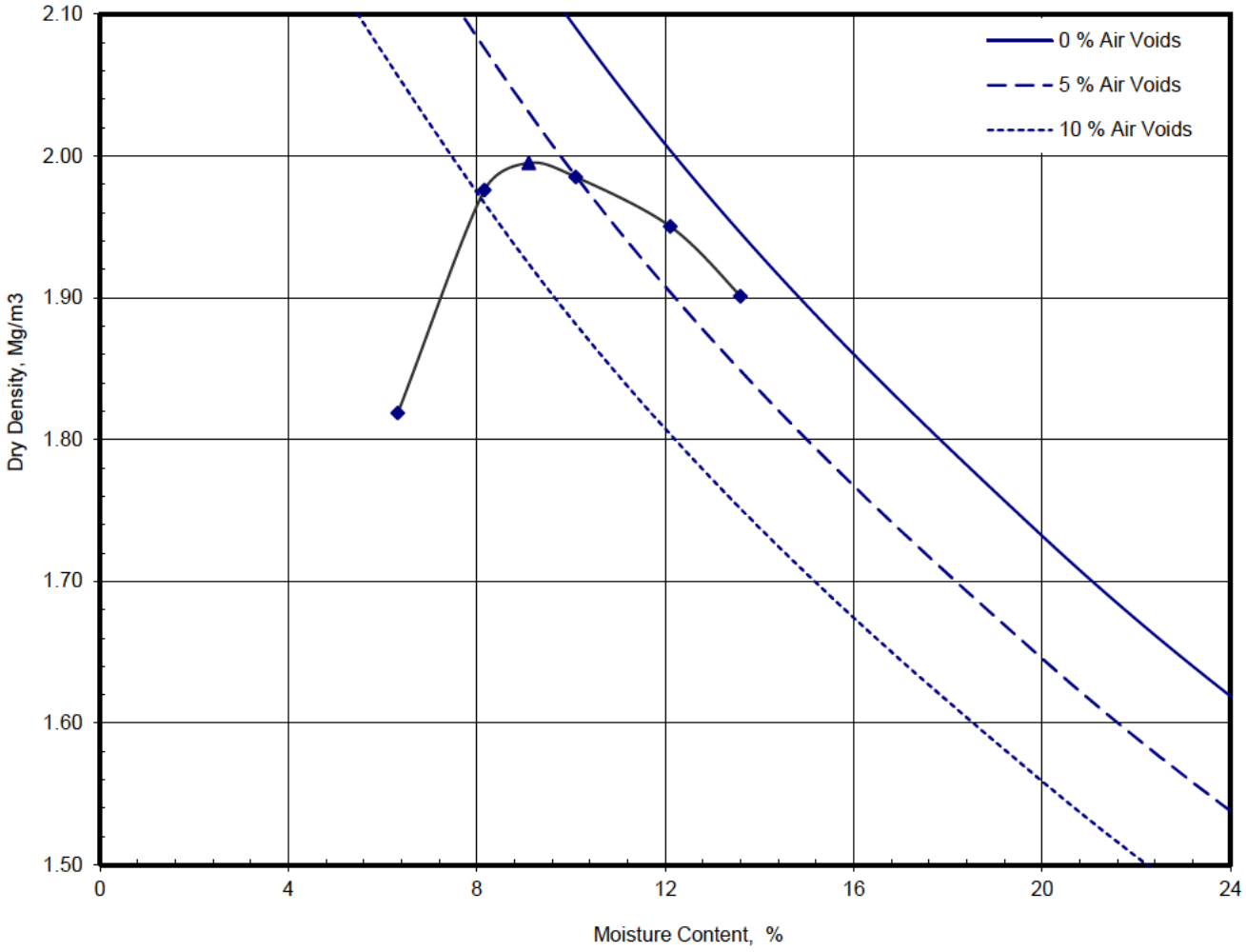
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Remarks

Date Printed 03/03/2025

COMPL

GQF-008-50 Issue 02 - June 24	**Dry Density / Moisture Content Relationship 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

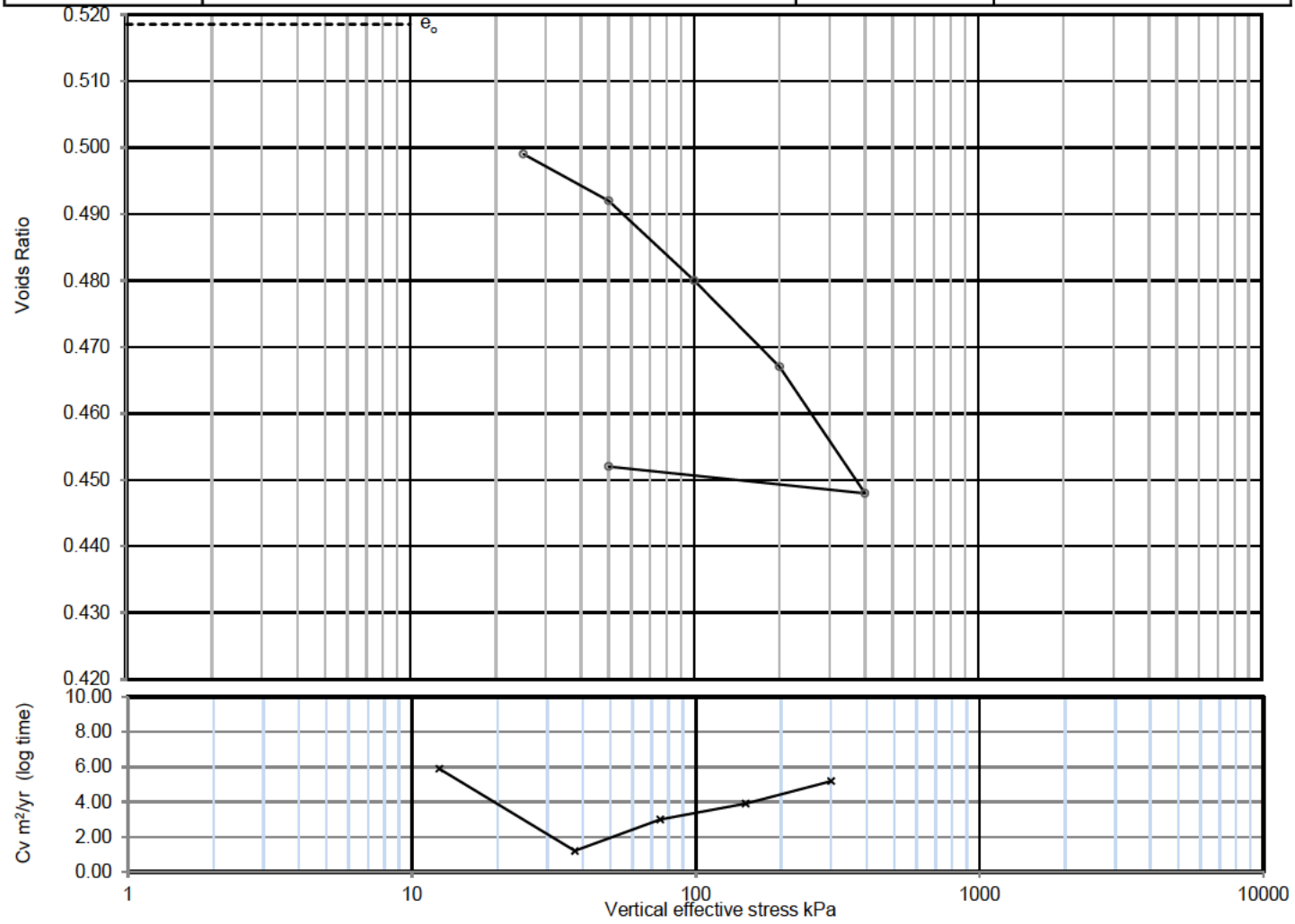


Preparation		Material used was natural
Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	12
Material Retained on 20.0 mm Sieve	%	42
Particle Density - Assumed	Mg/m³	2.65

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

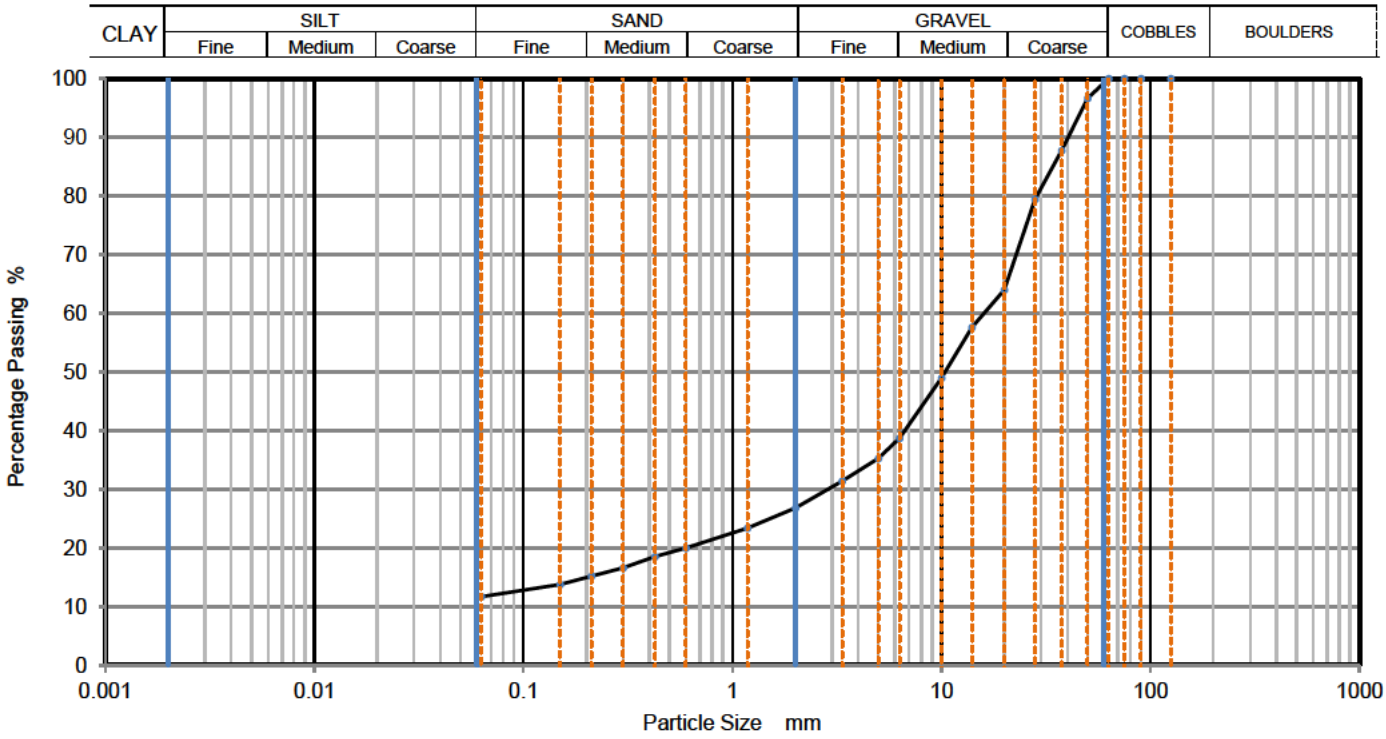
Hole No.	Sample				Soil Description	Hand Vane Determinations (kPa)			Remarks
	Ref	Top	Base	Type					
CP101		5.50	5.95	U	Stiff brown mottled grey thickly laminated slightly sandy silty CLAY	44	43	28	
CP102		1.20	1.65	U	Stiff brown slightly sandy gravelly CLAY				Not enough material for testing
CP102		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 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

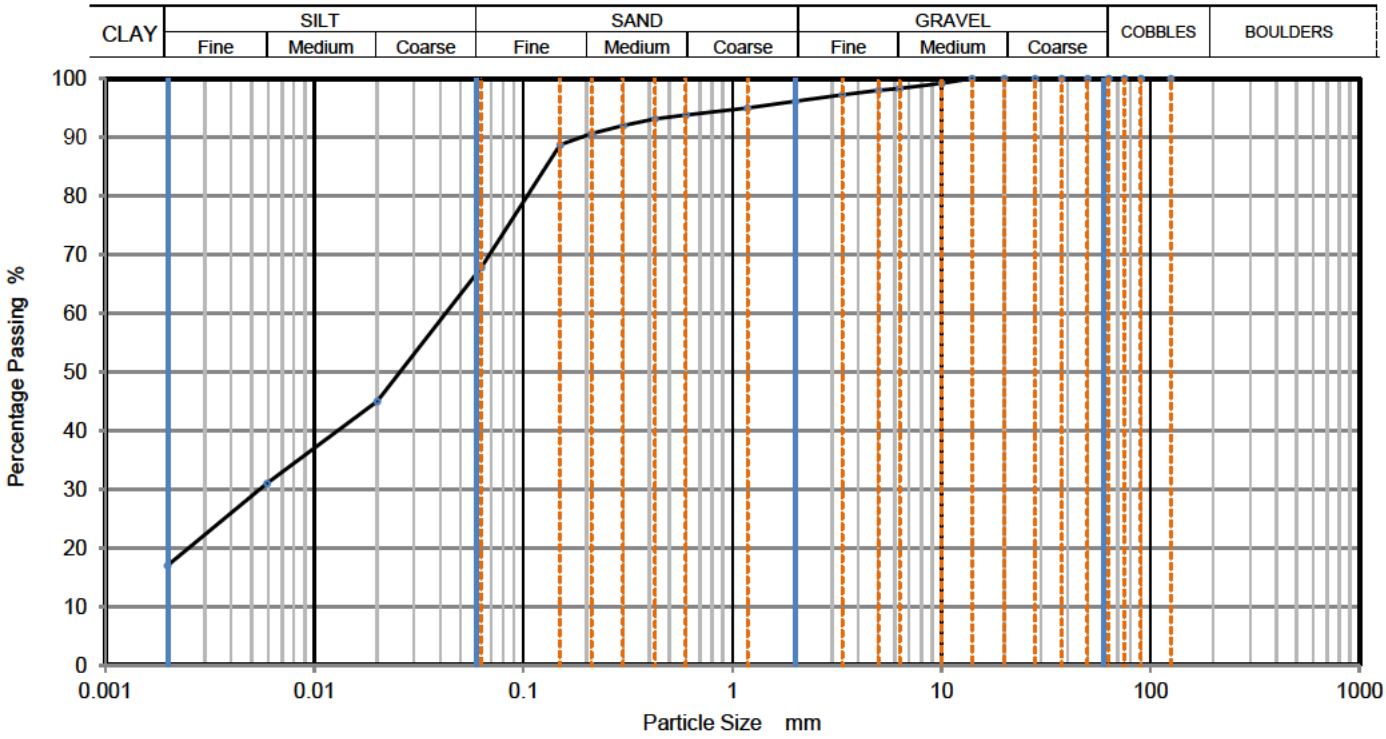
Grading Analysis		
D100	mm	63
D60	mm	16
D30	mm	2.87
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		
Pretreatment Method (If Applicable)		

Remarks

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

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

GFQ-008-77 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

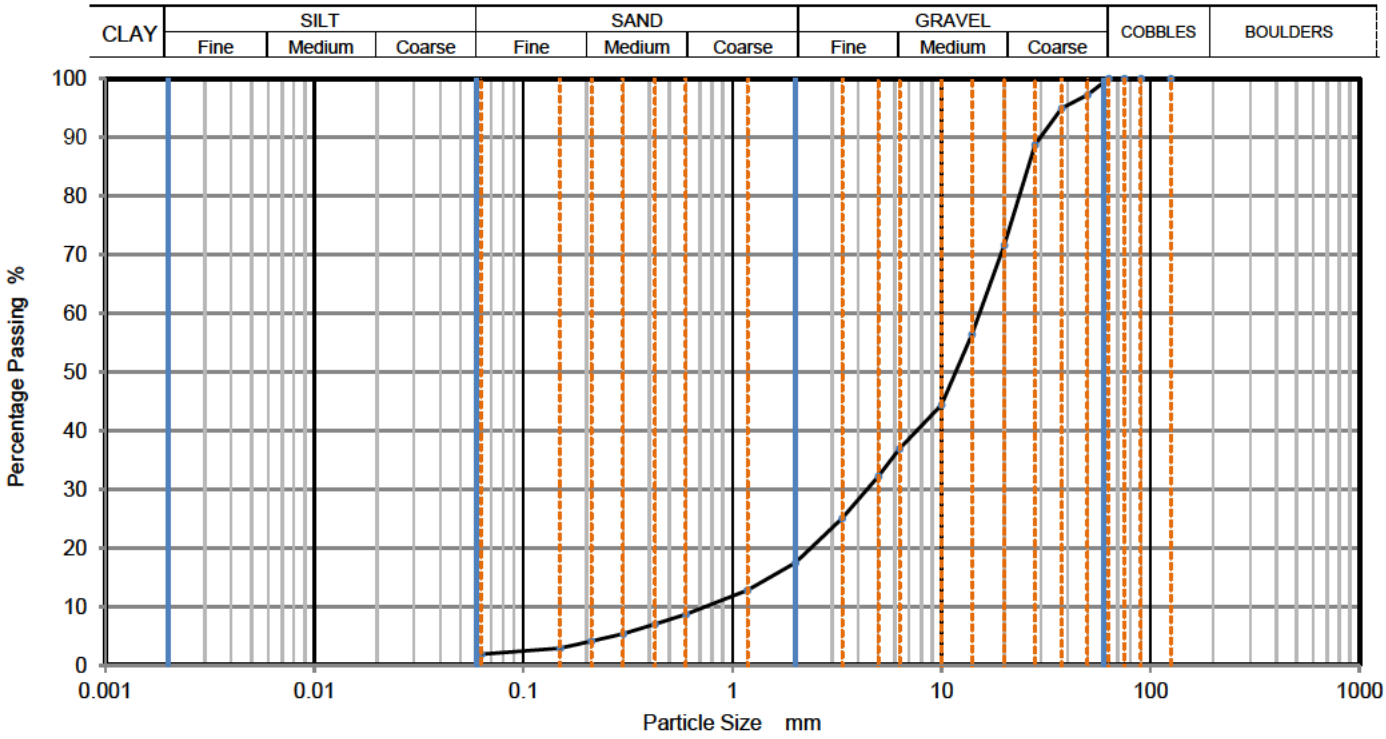
Grading Analysis		
D100	mm	14
D60	mm	0.0423
D30	mm	0.0057
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		
Pretreatment Method (If Applicable)		

Remarks

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

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

GFQ-008-77 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

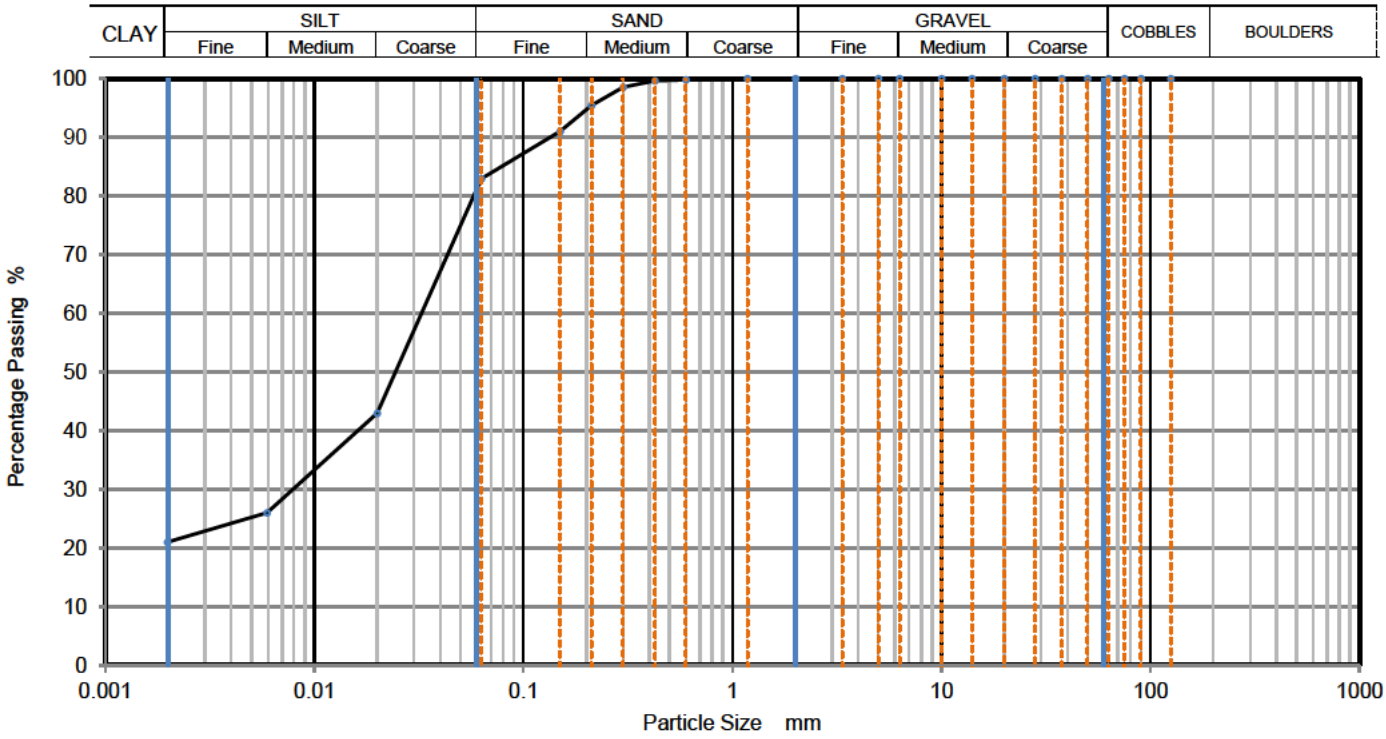
Grading Analysis		
D100	mm	63
D60	mm	15.2
D30	mm	4.42
D10	mm	0.749
Uniformity Coefficient		20
Curvature Coefficient		1.7
Pretreatment Method (If Applicable)		

Remarks

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

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

GFQ-008-77 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)		

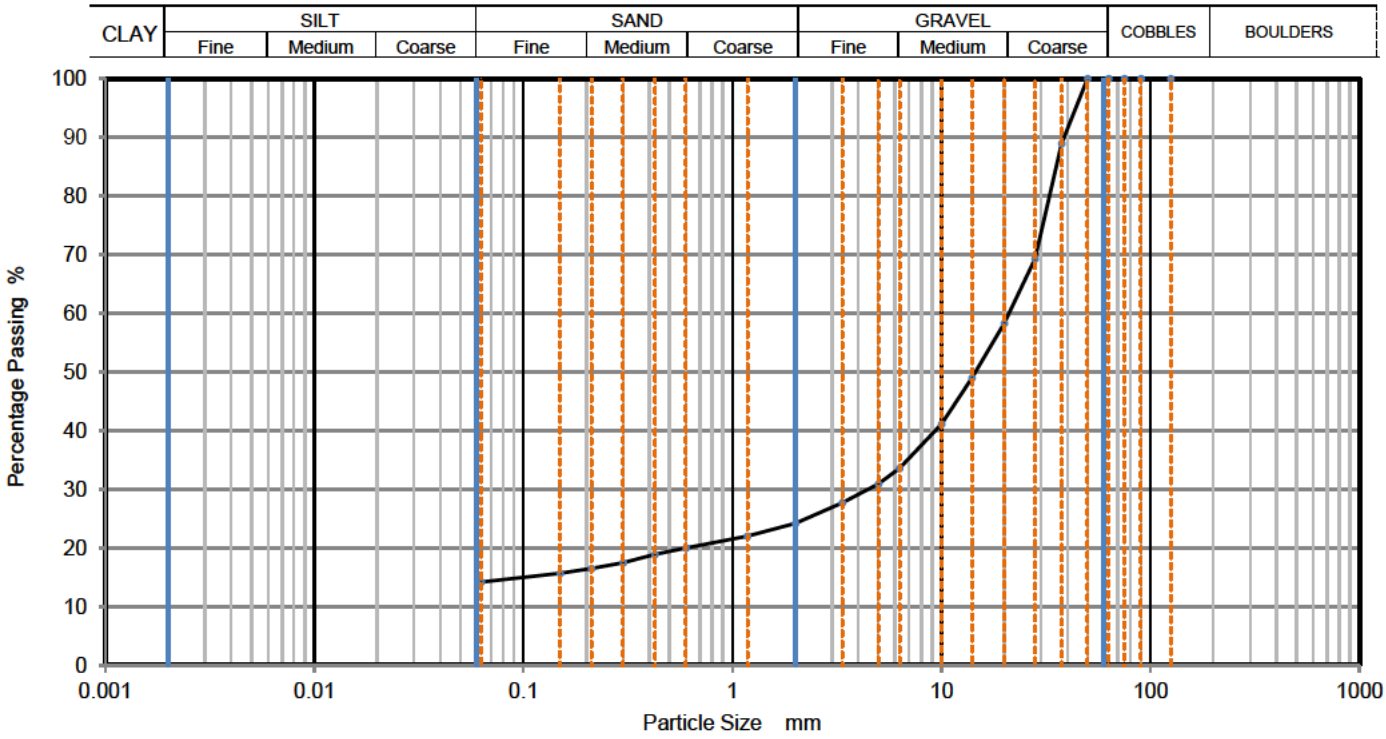
Remarks

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

Date Printed: 03/03/2025

ISO PSD

GFQ-008-77 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

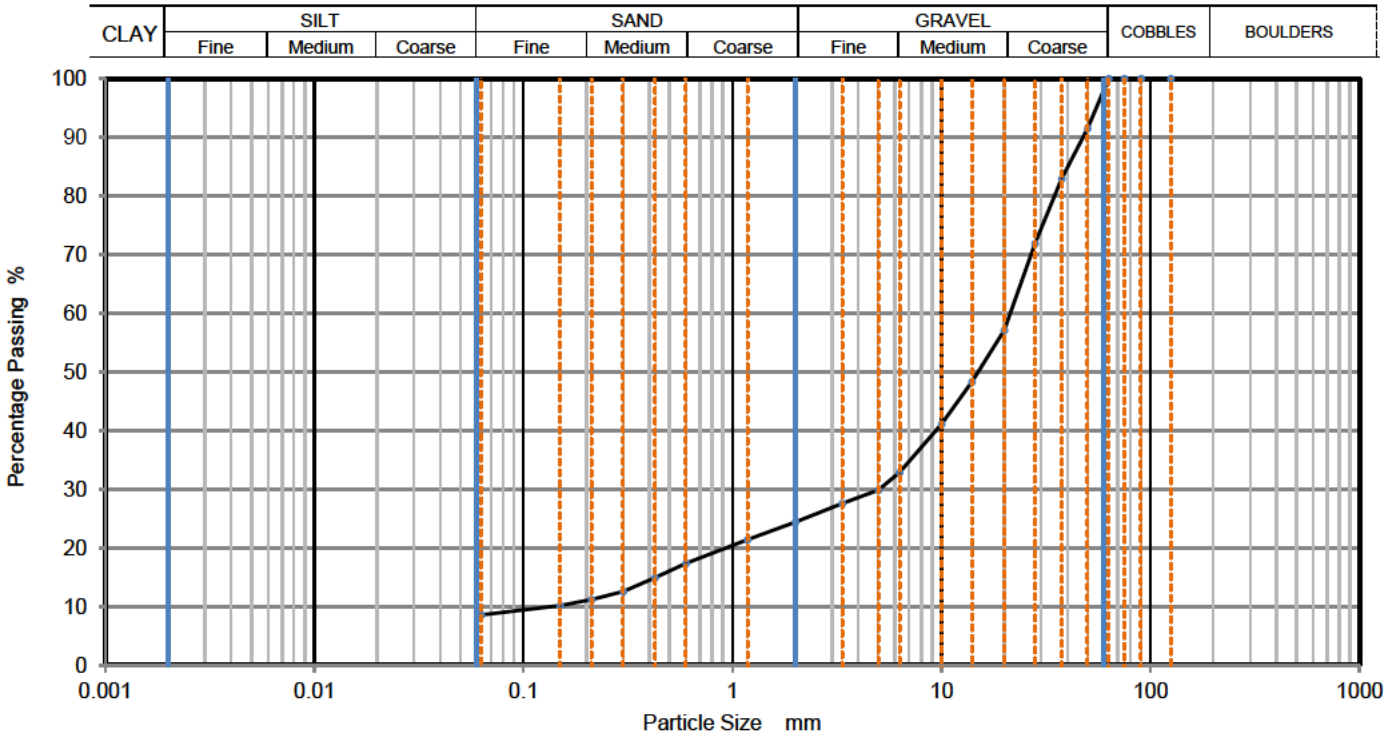
Grading Analysis		
D100	mm	50
D60	mm	21.1
D30	mm	4.46
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		
Pretreatment Method (If Applicable)		

Remarks

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

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

GFQ-008-77 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

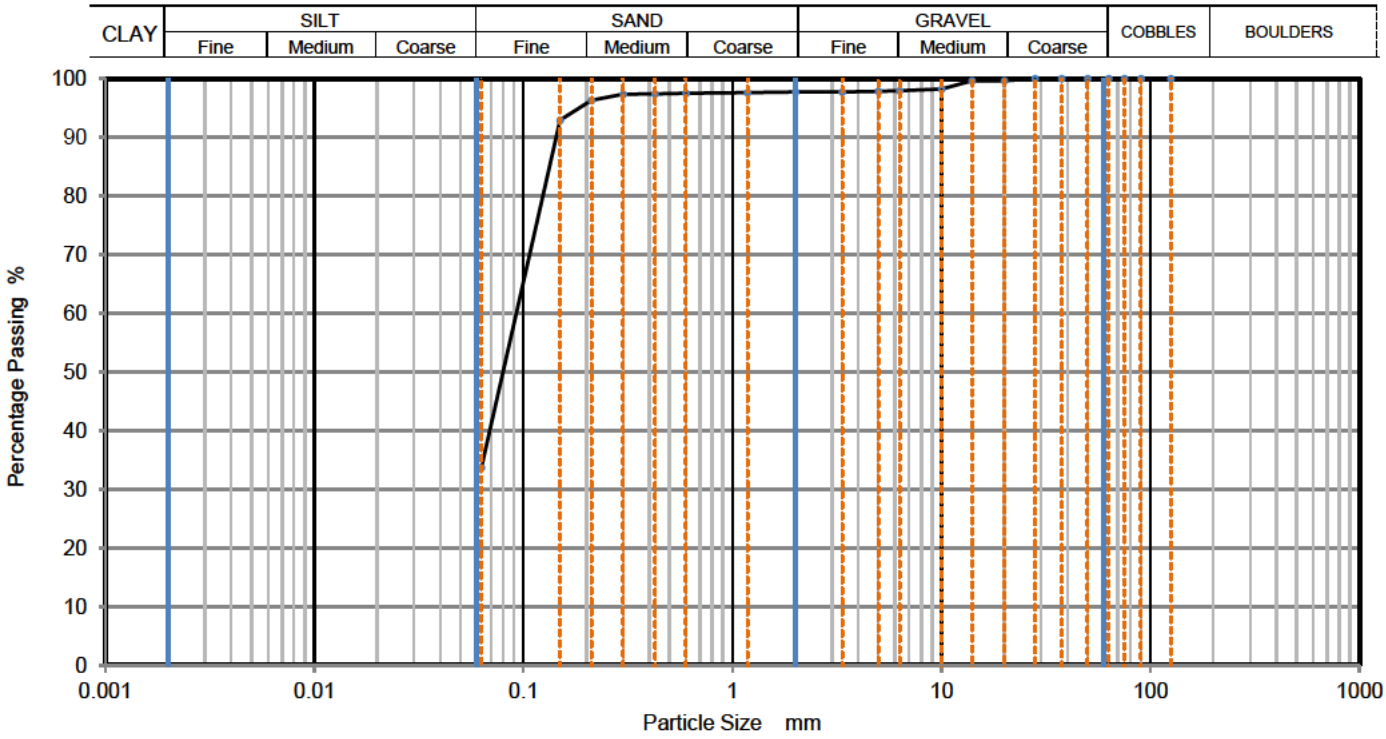
Grading Analysis		
D100	mm	63
D60	mm	21.4
D30	mm	5.03
D10	mm	0.133
Uniformity Coefficient		160
Curvature Coefficient		8.9
Pretreatment Method (If Applicable)		

Remarks

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

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

GFQ-008-77 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

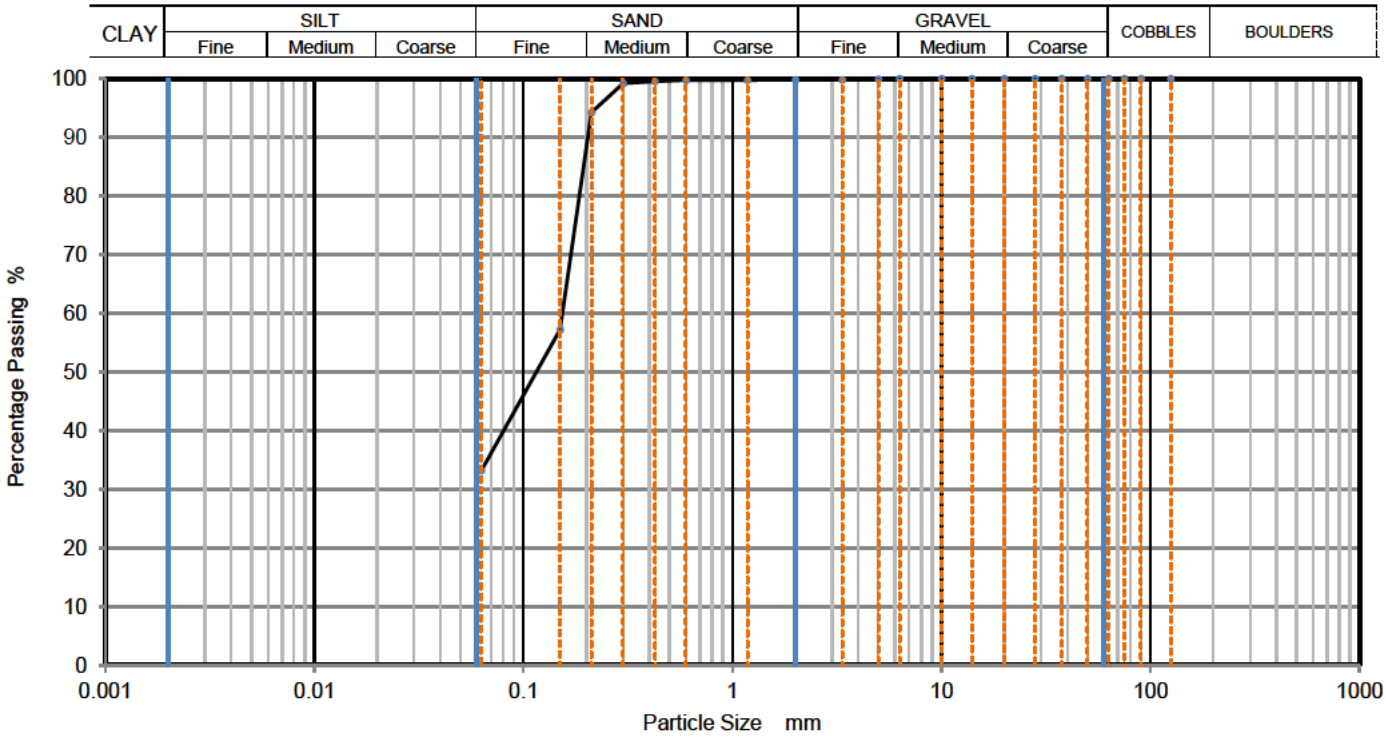
Grading Analysis		
D100	mm	28
D60	mm	0.0926
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		
Pretreatment Method (If Applicable)		

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 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

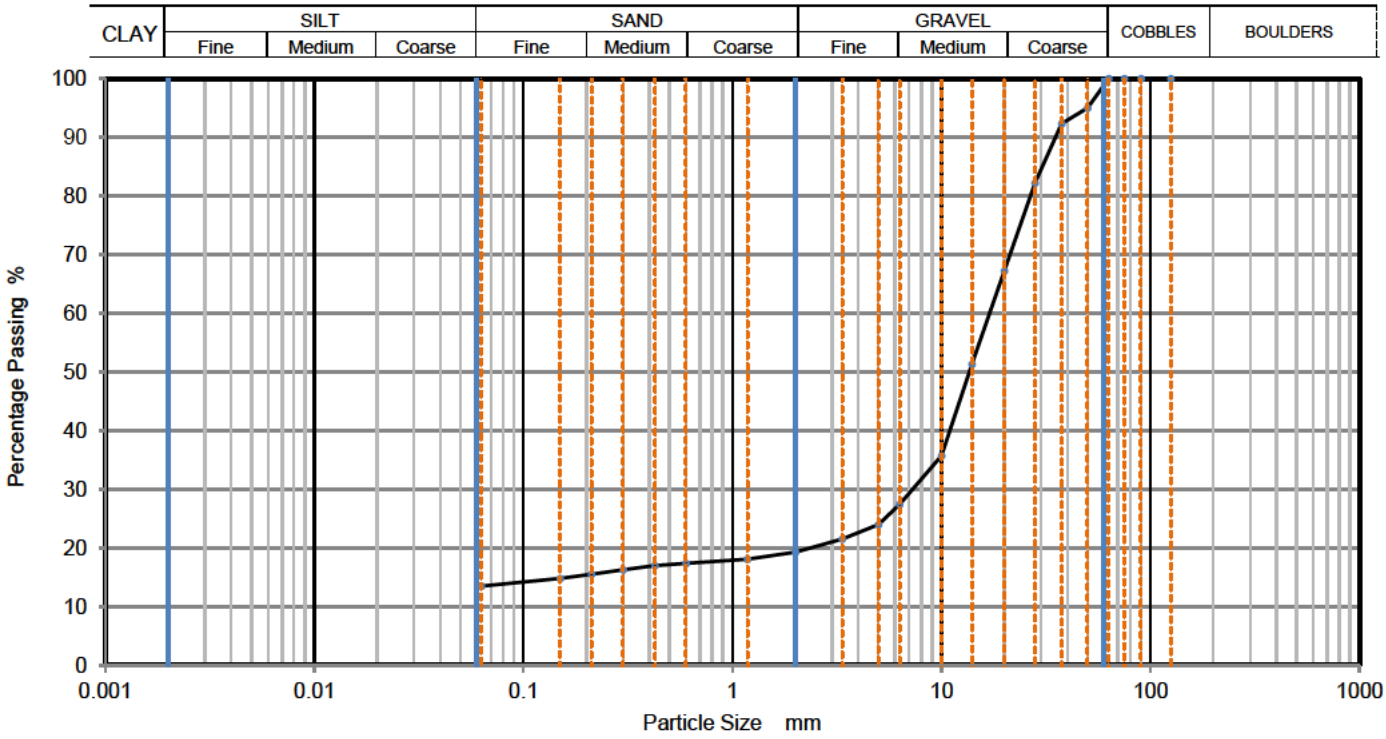
Grading Analysis		
D100	mm	6.3
D60	mm	0.154
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		
Pretreatment Method (If Applicable)		

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 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: 03/03/2025		**ISO PSD**

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

Hole No.	Sample				Soil Description	Test Type	Density		w	Length	Diameter	σ_3	At failure				Remarks
	Ref	Top	Base	Type			bulk	dry					Axial strain	$\sigma_1 - \sigma_3$	c_u	Mode	
							Mg/m^3		%	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)	σ_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. 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. 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. 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. 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. 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. 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. 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. Minor damage to crops, buildings or property.
Minor	No measurable effect on humans. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. 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