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Rigifa, Thurso

Phase 2 Ground Investigation Report

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Contents

Appendices

Appendix A – Drawings

Appendix B – Borehole Logs

Appendix C – Laboratory Testing Results

Appendix D – Groundwater/Gas Monitoring

Appendix E – Qualitative Risk Assessment Rationale

Executive Summary

Appointment	**Curtins was instructed by Field, to undertake an intrusive Phase 2 Ground Investigation for the development of a 200-megawatt (MW) battery energy storage system (BESS) and associated infrastructure in Rigifa, Thurso KW14 8XH (the Proposed Development).**
Current Site Status	The overall planning boundary comprises an area of 37.87 hectares (ha) which includes access roads, the planned Gills Bay substation site and additional areas for landscaping and drainage. Intrusive ground investigations (GI), and the subject of this report, has been limited to a 10.93 ha area within which excavation and ground reforming works are required, i.e. the BESS and substation compounds (referred to herein as the Site). The 10.93 ha Site is situated on a vacant field, currently used for agricultural purposes and consisting of open fields. The Site peaks in the centre of the Site before dropping in altitude to the north and to the south. The Site is centred on National Grid Reference (NGR) 329401, 971053.
Site History	With reference to the Curtins Phase 1 report, the earliest available mapping dating back to 1877 shows that the Site is a farmer's field with a sheepfold in the southwest of the Site. Between 1877 and 2023, minimal changes are shown on historical mapping of the Site with the exception of the sheepfold noted as a sheep dip in 1968. The sheep dip is no longer shown on the 2001 mapping. Beyond the Site boundary, the surrounding area is shown as farmland and woodland, with three quarries within 250 m of the Site boundary shown on historical mapping from 1907. By 1968 the three quarries are no longer identified as quarries on historical mapping. Instead, the extents of excavation for the two quarries to the west are shown (approximately 60 m and 75 m to the west of the Site), and the southern quarry is shown as a pond.
Ground Investigation	GI was undertaken in February 2024 and consisted of: • 7 No. Window Sample Boreholes. • 26 No. Machine Excavated Trial Pits. • One Hand Excavated Trial Pit. • Two In Situ Soakaway Tests. • Two In Situ Lightweight Deflectometer CBR Tests. • Chemical and Geotechnical laboratory analysis of samples retrieved from intrusive locations. • Three rounds of gas and groundwater monitoring undertaken over a six week period.
Geology	The British Geological Society records indicate that the site is underlain by superficial deposits identified as the Devensian Till and comprising Diamicton. The superficial deposits are in turn underlain by bedrock deposits from the Spittal Flagstone Formation comprising of siltstone, mudstone and sandstone. GI undertaken in February 2024 confirmed a typical sequence of topsoil underlain by superficial deposits of slightly gravelly sandy CLAY, underlain by weak grey Flagstone. Rockhead is recorded as relatively shallow across the Site,
Hydrogeology	Details on the hydrogeological classification of the Devensian Till are not given by SEPA mapping, although groundwater within the superficial deposits is likely to be limited due to the cohesive nature of the clay. The Spittal Flagstone Formation is characterised as a moderately productive aquifer, locally yielding small amounts of groundwater.

	Groundwater seepages were encountered during the GI but no groundwater was encountered in the boreholes during the monitoring period.
Generic Qualitative Assessment	Samples taken from GI were sent for chemical analysis at a laboratory. No detections of contaminants in exceedance of appropriate screening criteria were encountered. As such the risk to human health and the water environment from contaminants in soils is considered Low. Gas monitoring indicated minimal elevations of ground gas within monitoring installations. As such risk to future Site users from ground gas is considered Low.
Geotechnical Considerations	Samples taken from GI locations were sent to a laboratory for geotechnical analysis. Results indicate: • Superficial soils on Site are considered Class 1A or 2C as per Highways Specification 600 Series (SHW) subject to further geotechnical testing. • Weathered Flagstone is considered a suitable founding stratum for shallow pad foundations with a conservative allowable bearing capacity of 150 kN/m^2 • Should a raft solution be adopted, assuming a low volume change potential in the Glacial Till, 750 mm of Class 6F2/6F5 should be placed below the raft. All fill should be placed to an earthworks specification and a detailed settlement assessment should be undertaken to determine the material parameters required for the fill and to detail the compaction requirements, to ensure settlements are not excessive • A conservative CBR value of 2.5% is recommended for preliminary designs. Further in-situ CBR testing should be undertaken at formation level where hardstanding is proposed to confirm the CBR value used in preliminary design • Soakaway type drainage is not recommended on the Site due to the cohesive nature of the glacial till.
Conclusions and Recommendations	The environmental chemistry soil results have been compared with the Generic Assessment Criteria (GAC) for soils with respect to human health against “commercial” land use thresholds. The results of the environmental testing did not record any exceedances of contaminants above the adopted GACs nor the presence of asbestos and elevated concentrations of organochlorides. The contamination risk to controlled waters, both groundwater and surface water, is considered to be Low. The risk to end users from ground gases was considered to be Low. A review of the ground gas risk highlights no ground gas protection measures are required for the Site, however the BGS Radon Mapping confirms that the site in a moderate probability radon area where less than 5-10% of homes are estimated to be at or above the action level. Therefore basic radon protective measures are necessary in the construction of any enclosed spaces. If the new development incorporates a basement the advice of a specialist Radon assessor must be obtained. The bedrock underlying the Site is considered a suitable founding stratum due to the shallow depth beneath existing ground level and an estimated allowable bearing capacity of 150kPa for a 1.5m x 1.5m pad foundation at a minimum depth of 1.1m bgl. For a proposed raft foundation, a minimum 750 mm of Class 6F2/6F5 granular fill would need to be placed beneath the slab (assuming a low volume change potential within the Cohesive Glacial Till) with Class 2 general fill placed down to the weathered bedrock of the Spital Flagstone Formation. All fill materials should be placed and compacted to an earthworks specification. N.B. the low volume

change potential described above is based on engineering judgement in this area of Scotland including investigations in similar over consolidated glacial till soils and descriptions of the soil but is subject to receipt of further testing. A detailed settlement assessment should also be undertaken to confirm the material parameters required for the fill, compaction requirements, the appropriate thickness of Class 6F2/6F5 granular fill beneath the raft and to ensure settlements are not excessive

The preliminary in-situ soakaway tests carried out as part of the site investigation works indicated poor infiltration characteristics of the underlying glacial deposits being unsuitable for soakaway infiltration. It is recommended that if soakaway infiltration is proposed as part of the Proposed Development (for example within the bedrock soils), confirmatory soakage testing is undertaken at the specific intended soakaway locations and mimicking the proposed volumes/depths, once the drainage design is finalised.

At this stage, based on the CBR results carried out and where near surface natural soils are encountered at road pavement formation levels, a CBR of <2.5% can be assumed and full road capping should be allowed for to mitigate total and differential settlements. Further in-situ CBR testing should be undertaken at formation level where hardstanding is proposed to confirm the CBR value used in preliminary design.

In light of the ground investigation undertaken to date across the Site, the following recommendations are made:

- No further works are considered necessary and based on this information a remediation strategy is not considered necessary.
- The BGS Geoindex and UK Radon Mapping confirms the site is situated in a low probability radon area where 5-10% of homes are estimated to be at or above the action level. Therefore, basic radon protective measures are necessary in the event of the construction of enclosed spaces. Whilst no basement is included as part of the Proposed Development, if a basement is required, the advice of a specialist Radon assessor must be obtained.
- Earthworks to be undertaken to Earthworks specification and detailed settlement assessment likely to be required for a raft foundation solution.

1.0 Introduction

1.1 Project Background

Curtins was instructed by Field to undertake a Phase 2 Site Investigation for the development of a battery energy storage system (BESS) with a capacity of up to 200 megawatts (MW) and associated infrastructure at Rigifa, Thurso KW14 8XH (the Proposed Development). The Proposed Development would charge and discharge electricity via the planned and consented Gills Bay substation. The Proposed Development principally comprises:

- Battery storage units arranged into rows;
- Medium-voltage (MV) skids and ancillary low-voltage (LV) equipment;
- High-voltage (HV) grid transformers;
- Air insulated switchgear;
- A substation building comprising welfare facilities, a switch room and control room;
- An interface substation and underground 132 kV grid connection cable; and
- Site-wide supporting infrastructure including cabling, access tracks, fencing, attenuation basins, and landscaping measures.

The site layout associated with the Proposed Development is included in Appendix A.

Curtins previously provided a Phase 1 Preliminary Risk Assessment (ref. 085444-CUR-XX-XX-RP-GE-0001) (1) for the Proposed Development which recommended a Phase 2 ground investigation to further determine the contamination risk on-site and support the geotechnical design of the structure.

1.2 Scope of Services

The investigation was undertaken to provide an assessment of both geoenvironmental and geotechnical ground conditions on the subject site with respect to any potential contamination in the underlying soils and / or groundwater.

Specifically, the report is intended to:

a) Determine if there is a risk of the proposed end user being adversely impacted upon by potential contamination in shallow site soils that may be present on the site due to its known current, recent and historical use.

b) Determine if there is a risk of groundwater and / or surface water being adversely impacted upon by potential contamination that may be present on the site due to its known current, recent and historical use.

c) Determine if there is a risk to the end user from soil gases including methane, carbon dioxide, oxygen, and hydrogen sulphide.

d) Determine shallow and deep ground conditions.

e) Make recommendations for the design of foundations.

f) Make recommendations for hardstanding design.

g) Make recommendations for earthworks on Site.

2.0 Site Setting

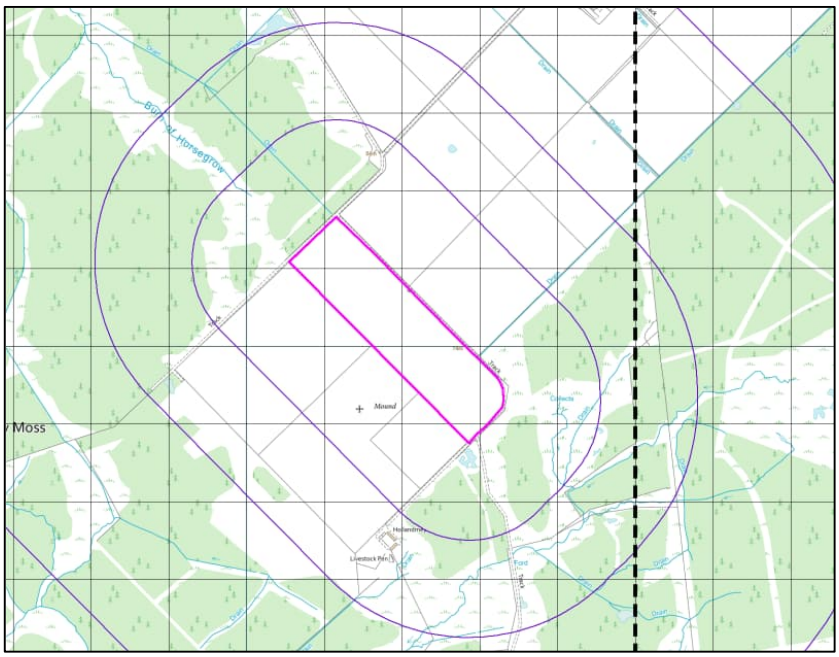
2.1 Current Setting

The overall planning boundary comprises an area of 37.87 hectares (ha) which includes access roads, the planned Gills Bay substation site and additional areas for landscaping and drainage. Intrusive ground investigations, and the subject of this report, has been limited to a 10.93 ha area within which excavation and ground reforming works are required, i.e. the BESS and substation compounds (referred to herein as the Site).

The Site is currently situated on a vacant site, currently used for agricultural purposes and consisting of open fields. The Site peaks in the centre of the Site before dropping in altitude to the north and to the south.

The Site is centred on National Grid Reference (NGR) 329401, 971053. The Site location is presented in Figure 2.1 below.

Figure 2.1: *Site Location Plan (Site Boundary shown in pink and 250m buffer in purple)*



2.2 Surrounding Land Use

The immediate surrounding land use to the development Site is highlighted in **Table 2.1**.

Table 2.1: *Surrounding Area*

Surrounding Area	N	Woodland and agricultural fields
	E	Agricultural fields
	S	Agricultural fields
	W	Agricultural fields

2.3 Site History

With reference to the Curtins Phase 1 report, the earliest available mapping dating back to 1877 shows that the Site is a farmer's field with a sheepfold in the southwest of the Site. Between 1877 and 2023, minimal changes are shown on historical mapping of the Site with the exception of the sheepfold noted as a sheep dip in 1968. The sheep dip is no longer shown on the 2001 mapping. Beyond the Site boundary, the surrounding area is shown as farmland and woodland, with three quarries within 250m of the Site boundary shown on historical mapping from 1907. By 1968 the three quarries are no longer identified as "quarries" on historical mapping. Instead, the extents of excavation for the two quarries to the west are shown (approximately 60m and 75m to the west of the Site), and the southern quarry is shown as a pond.

2.4 Geology, Hydrogeology and Hydrology

With reference to the Phase 1 report, and the 1:50,000 BGS map (Wick – Sheet 116), the Site is underlain by superficial deposits identified as the Devensian Till and comprising Diamicton. The superficial deposits are in turn underlain by bedrock deposits from the Spittal Flagstone Formation comprising of siltstone, mudstone and sandstone.

Details on the hydrogeological classification of the Devensian Till are not given by SEPA mapping, although groundwater within the superficial deposits is likely to be limited due to the cohesive nature of the clay. The Spittal Flagstone Formation is characterised as a moderately productive aquifer, locally yielding small amounts of groundwater.

There are no recorded licensed surface water abstractions recorded within 1 km of the Site. A former well was noted on the 1906 map extract and was located adjacent to an existing property approximately 300 m southwest of the Site. No further information was available. There are no records of a discharge consent within 250 m of the Site.

The nearest surface water feature is the Burn of Horsegrow, located circa 100 m northwest of the Site.

2.5 Unexploded Ordnance (UXO) Risk Assessment

Risk mapping (Ref.7) for UXOs has placed the Site in a Low risk area. Low risk areas are those with a bombing density of up to 10 bombs per 1000 acres. These areas are considered to have a low UXO risk.

The Envirocheck Report historical mapping (Ref.1) does not indicate any ruins, or buildings that disappeared during WWII, on or surrounding the Site.

Based on the forgoing commentary, the likelihood of encountering UXO on Site as part of the ground investigation or development works is Low.

If unexploded ordnance is discovered, stop immediately, prevent access to the area, and inform the police. If the Site boundary or location changes, then the UXO risk should be reassessed.

3.0 Initial Conceptual Site Model

With reference to the Phase 1 report, the Initial Conceptual Site Model (CSM) provided within the Phase 1 report is included in **Table 3.1** below.

The CSM details the source-pathway-receptor linkages or potential contaminant linkages (PCL) that have been identified for the site. The GQRA details the associated level of risk relating to these potential contaminant linkages**.**

The CSM concerns risk to human health, water and environment. The CSM follows the framework outlined within CIRIA C552 which is summarised within **Appendix E**.

The 'risk rating' within the CSM refers to the risk that the source, pathway, receptor linkage or PCL is complete. Unless specifically stated it does not necessarily refer to an immediate risk and is intended to be used as a tool to assess the necessity for further assessment/investigation.

- **Table 3.1** below represents the first stage in the land quality risk assessment process; **the Qualitative Risk Assessment**.
- In order for a development site to be deemed 'suitable for use' the level of risk needs to be brought down to acceptable levels, i.e., low to negligible risk. The purpose of each stage of risk assessment is ultimately to establish if there is a requirement for additional levels of assessment to be made in order to have sufficient confidence to support a risk characterisation or management decision, e.g., remedial action.
- In the absence of specific site data, a Generic Quantitative Risk Assessment is invariably recommended.

Conceptual Site Model			*Qualitative Risk Assessment*			*Recommended Actions*
Source	*Pathway(s)*	*Receptor(s)*	*Consequence*	*Likelihood of Occurrence*	*Risk Rating*	
Made Ground and contamination associated with the Sheep Dip. **Fuel Spills from farming equipment during farming activities on the Site.**	**Direct contact, ingestion,** *inhalation (dust and vapours).*	***Site end-user***	**Medium** *Acute health risk*	**Low** *Due to the nature of the Site having undergone minimal development over time the presence of made ground is considered Low, however, there is potential for contaminants associated with the sheep dip.*	***Moderate/ Low***	**Generic Quantitative Risk Assessment** recommended as part of the ground investigation to confirm risk assessment
	Vertical migration through the superficial deposits (soils) *May occur due to physical processes including; capillary action and downwards into the natural deposits through infiltration, however, on site superficial deposits are likely cohesive in nature, as such are likely to reduce likelihood of vertical migration.*	**Water Environment (groundwater)** *Unclassified Aquifer.* *No potable abstraction points located within the vicinity of the site.* *The site is not within a source protection zone.*	**Mild** *Pollution of non-sensitive water resources*	**Low** *There is potential for the leaching of contamination form made ground arising from the site, however there is also a lack of potable abstractions within the area.*	***Low***	**No action required**
	Horizontal migration over and through the superficial deposits *(soils).*	**Water Environment (surface water)** *Burn of Horsegrow*	**Medium** *Pollution of sensitive water resources*	**Unlikely** *Unlikely considering the distance to the receptor.*	***Moderate/ Low***	**Generic Quantitative Risk Assessment** recommended as part of the ground investigation to confirm risk assessment.
Production of ground generating gases from: • *Made ground from infilled quarries to the south and west of the Site.*	**Vertical and horizontal migration** *through existing service corridors and the underlying superficial deposits.*	*Site end-user*	**Medium** *Human health risk*	**Likely** *With reference to BS8576:2013 (Ref.10), these sources are considered to have a moderate gassing potential.*	***Moderate***	**Ground Gas Monitoring** Risk is considered Moderate due to proximity of western quarries, cohesive nature of on-site deposits and lack of infill of quarry adjacent to the Site. Ground Gas Monitoring should mitigate any residual risk to future Site users.

4.0 Fieldworks

4.1 General

The ground investigation was undertaken by Curtins between 20th and 1st March 2024. A summary of the scope and rationale for the intrusive works undertaken is summarised in Table 4.1 below.

The ground investigation was designed by Curtins in relation to the proposed development plans, findings of the Phase 1 and in general accordance with current UK guidance including LCRM (3), British Standard (BS) 10175 (4), BS5930:2020 (5) and Eurocode 7 (6).

Table 4.1: *Phase 2 Ground Investigation Scope and Rationale*

Exploratory Hole Type	Exploratory Hole Ref.	Exploratory Hole Depth (m bgl)	Rationale
7 No. Window Sample Boreholes	BH01 BH02 BH03 BH04 BH05 BH06 BH07	1.30 1.90 2.10 1.55 2.35 1.90 1.65	• To determine deeper ground conditions and potential deeper foundation design. • To confirm geotechnical parameters. • Collect soil and groundwater samples (if available) for geotechnical analysis. • To determine groundwater depth/level.
28 No. Machine Excavated Trial Pits	TP01 TP02 TP03 TP04 TP05 TP06 TP07 TP08 TP09 TP10 TP11 TP12 TP14 TP15	1.20 0.65 1.30 1.20 1.80 1.20 1.20 1.40 1.80 1.80 0.90 1.60 1.10 1.05	• To mass characterise shallow ground conditions. • Target potential areas of contamination and collect soil samples for chemical analysis. • Obtain bulk geotechnical samples for earthworks laboratory testing.

Exploratory Hole Type	Exploratory Hole Ref.	Exploratory Hole Depth (m bgl)	Rationale
	TP16	1.05	
	TP17	1.60	
	TP18	1.30	
	TP19	1.20	
	TP20	1.60	
	TP21	1.50	
	TP22	1.60	
	TP23	1.30	
	TP24	0.80	
	TP25	1.30	
	TP26	1.70	
	TP27	1.10	
	TP28	1.70	
2 No. In Situ Soakaway Tests	SA01 SA02	1.10 1.20	• Perform infiltration tests for potential soakaway design.
2 No. In Situ CBR Tests (Light Weight Deflectometer)	CBR1 CBR2	1.14 0.67	• To establish CBR value of shallow soils and inform pavement design.
1 No. Hand Excavated Pit	HP01	0.70	• To retrieve samples in area associated with historical sheep dip • Target a specific area associated with contamination

Curtins Exploratory Hole Location drawing (085449-CUR-00-XX-DR-GE-0002) records the locations of all exploratory hole locations a copy of which is contained within **Appendix A**.

4.2 Soil Logging and Sampling

Exploratory hole arisings were logged on site by a suitably qualified engineer in accordance with the requirements of BS5930:2015+A1:2020 (5). Copies of the exploratory hole logs are provided in **Appendix B**, with ground conditions presented in **Section 5.1**.

Representative soil samples were selected for laboratory chemical and geotechnical analysis, based on field observations and to provide a characterisation of the strata encountered. The samples were placed in laboratory provided containers and stored in cool boxes prior to being transported to the nominated laboratory under the laboratory's chain of custody documentation. The laboratory selected by Curtins for chemical analysis was DETS and geotechnical analysis was MATtest Ltd.

4.3 Monitoring Well Installations

Standpipes comprising 50 mm diameter plain and slotted pipework were installed within the 7 No. window sample boreholes to enable ground gas and groundwater monitoring.

A bentonite seal was placed above the screened section of the borehole to minimise potential for downward migration of contaminants and the creation of a preferential migratory pathway. A gravel aggregate surround was installed in the annulus between the sides of the borehole and the slotted sections of pipe.

The installed response zones are summarised in **Table 4.3** below.

Table 4.3: *Monitoring Well Response Zones*

Exploratory Hole Ref.	Response Zone(s) (m bgl)	Strata description
BH01	0.30 – 1.00	Brown and grey sandy gravelly CLAY
BH02	0.50 – 1.90	Dark brown sandy CLAY and FLAGSTONE
BH03	0.50 – 1.90	Brown and grey sandy CLAY and FLAGSTONE
BH04	0.30 – 1.20	Brown gravelly clayey SAND and brownish grey sandy gravelly CLAY
BH05	0.50 – 2.00	Brown and grey sandy gravelly CLAY and dark grey sandy gravelly CLAY
BH06	0.50 – 1.80	Grey gravelly CLAY and FLAGSTONE
BH07	0.50 – 1.60	Brown and grey sandy gravelly CLAY and dark grey sandy gravelly CLAY

4.4 Post Investigation Monitoring

An initial programme of three gas and groundwater monitoring visits were proposed in order to determine the underlying gas and groundwater regime for the Site. The three return monitoring visits have been undertaken between the 11th March and 10th April 2024, and are summarised in **Appendix D**.

5.0 In-Situ & Laboratory Testing

5.1 Environmental Chemical Testing

A programme of environmental chemistry testing was scheduled, with analytical suites developed reflecting the preliminary CSM in **Section 3.0** and observations made during the ground investigation.

Given limited potential sources of contamination were identified, sampling positions were generally located in a semi-targeted array to give an adequate and representative coverage of the Site accounting for the historical site use and the immediate environmental setting, along with targeting areas of the Proposed Development.

5.1.1 Soil Analysis

Soil samples were taken from the Topsoil across the Site and tested for the suite listed in **Table 5.1**.

The nature and type of soil contamination potentially present on the Site was considered to include, amongst others; ash, petroleum hydrocarbons (e.g., fuel oils), heavy metals and asbestos the extent of which is captured by the broad environmental testing suite detailed in **Table 5.1**. Copies of the environmental chemistry testing certificates can be referred to in **Appendix C** of this report.

Table 5.1: *Environmental Chemistry Analysis Suite: Soils*

Analysis	Limit of Detection (LOD)
Asbestos Screen	N/A
pH	N/A
Organic Matter	0.1%
Arsenic	1 mg/kg
Boron (water soluble)	0.2 mg/kg
Cadmium	0.1 mg/kg
Chromium	0.15 mg/kg
Chromium VI	1 mg/kg
Copper	0.2 mg/kg
Lead	0.3 mg/kg
Mercury	0.05 mg/kg
Nickel	1 mg/kg
Selenium	0.5 mg/kg
Zinc	1 mg/kg
TPH (Aro/Ali C5-C35) inc BTEX	0.01 to 10 mg/kg
PAH (speciated)	<0.05 to <0.1 mg/kg
Phenols (total)	<0.1 mg/kg
Cyanide (total)	0.1 mg/kg
Sulphate (SO_4)	<1.25 mg/l

5.2 Geotechnical Testing

Soil samples taken during the ground investigation works were prepared in accordance with BS1377: Part 1:2016. The following geotechnical in-situ and laboratory testing has been undertaken as presented in **Table 5.2**. The results of the testing are discussed further in **Section 6.0** and presented in **Appendix C**.

Table 5.2: *Geotechnical Testing Undertaken*

Test Type	Quantity	Standard
In-Situ Testing		
Standard Penetration Testing	12	BS5930:2015, Clause 41
In-Situ CBR	2	BS 1377:1990
Laboratory Testing		
Particle Size Distribution (wet sieve)	17	BS 1377:2022
Water Content	20	
Bulk Density	8	
Particle Density	9	
CBR	5	
Water Content/Dry Density Relationship	8	

6.0 Ground Conditions

6.1 Encountered Ground Conditions

The following section discusses the ground conditions determined from the ground investigation and laboratory testing described in **Section 5.1** with detailed information presented on the exploratory hole logs in **Appendix B**.

Where necessary, determination of characteristic parameters has been based on a cautious estimate of results derived from laboratory, published correlations and field tests and complemented with engineering judgement and consideration of the relevant limit state. The parameters are not considered to be absolute and should be referenced with the specific strata text in this section and reviewed when considering a specific area of the Site. The below figures should be referenced accordingly in relation to the field and laboratory testing results.

Table 6.1: *Summary of Ground Conditions Encountered*

Stratum	Depth to top of strata		Thickness (m)		General Description
	m BGL	m AOD	Min	Max	
Topsoil	GL	62.63 – 73.16	0.20	0.40	Dark brown organic slightly sandy CLAY. Frequent organic matter (peaty in places). Dark brown clayey sandy peaty TOPSOIL with frequent vegetation.
Devensian Till - Diamicton	0.2	62.33 – 72.91	0.30 (TP06)	1.80 (BH05)	Soft to stiff brown and grey mottled orange slightly silty slightly sandy slightly gravelly CLAY.
Spittal Flagstone Formation	0.70	61.03 – 72.06	0.05*	2.00*	Weak dark grey FLAGSTONE recovered as an angular to fine gravel.

Notes - *Total thickness not proven (Base of unit not encountered).

6.1.1 Topsoil

Ground levels within all exploratory hole locations across the Site comprised Topsoil material consisting of a dark brown organic slightly sandy CLAY, with frequent organic matter /vegetation (peaty in places). Topsoil thickness was variable from 0.20 m to 0.40 m. It should be noted that whilst the Topsoil is described as peaty in specific locations, the soil was not considered to be peat due to inorganic components (sand and clay) appearing more prevalently than organic content during the fieldwork.

6.1.2 Superficial – Glacial Till Deposits

Glacial Till deposits were encountered beneath Topsoil in all exploratory hole locations. The strata was typically encountered as a soft to stiff brown and grey mottled orange slightly silty slightly sandy slightly gravelly CLAY with high cobble content. Thickness was variable between 0.30 m and 1.80 m.

Classification Testing

13 No. particle size distribution tests (PSD) were undertaken on samples of Glacial Till. The results of these tests are presented in **Appendix D**. The results suggest a very clayey sand with granular content ranging between 50-64% and fines ranging between 37-57%.

Without Atterberg Limit Testing, the plasticity of the Glacial Till cannot be confirmed, and therefore for conservatism, and based on the descriptions provided in the field during logging, the Glacial Till has been assumed to be cohesive.

4 No. Standard penetration tests (SPTs) carried out from 1.2 m achieved full penetration which recorded an uncorrected 'N' value range of 11-45 with an average 'N' value of 18.

Unit Weight

A unit weight of 17 kN/m^3 is recommended based on the guidance in BS8004:2015 (9) for a low to medium strength clay.

Earthworks Testing

The Specification for Highways Works (Volume 1, Series 600 Earthworks) classifies a material with >15% fines (<63µm) as a cohesive material and material with <15% fines as a granular material.

Based on proposed site levels, it is appropriate to consider the shallow soils to be excavated in areas of cut to classify as a Class 2 acceptable earthworks material.

13 No. Particle Size Distribution (PSD) tests were undertaken on samples submitted from the superficial Glacial Till. The results classify the samples as a Class 2 acceptable earthworks material subject to oversize material being removed.

8 No. dry density/moisture content relationship tests were undertaken on samples taken of the superficial Glacial Till.

Table 6.2 – Suitability for Reuse of Materials

Location Reference	Test Depth m bgl (Elevation m AOD)	Optimum Moisture Content (%)	Maximum Dry Density (Mg/m3)	As Received Moisture Content (%)	Wet/Dry of Optimum
TP02	0.60	15.5	1.79	16.7	Wet
TP04	1.00	13.9	1.85	15.8	Wet
TP09	0.60	21.0	1.62	22.3	Wet
TP12	0.60	11.4	1.85	18.2	Wet
TP14	0.60	13.4	1.81	17.5	Wet
TP19	0.60	13.0	1.82	22.8	Wet
TP27	1.00	12.2	1.86	17.3	Wet
BH04	1.00	11.5	1.84	17.7	Wet

Table 6.2 displays the results of the Maximum Dry Density/Optimum Moisture Content tests within the Cohesive Glacial Till. 8 No. out of 8 No. samples of the cohesive Glacial Till tested suggest that the moisture content is too high (wet of optimum moisture content) in order to achieve adequate compaction. Therefore a degree of drying out is likely to be required in order to compact the material sufficiently below structures or external areas. Excavating the soils during earthworks will naturally cause a degree of drying out; it is recommended that the stockpiled soils are retested to ascertain their moisture content prior to placement. If the moisture content is still too high, lime or a cement-based agent could be used to reduce the moisture content to acceptable levels subject to discussions with a suitable ground improvement expert / lime stabilisation company. Acceptable levels for compaction should be reported in a site-specific Earthworks Specification.

The maximum dry density ranged from 1.62 Mg/m^3 to 1.86 Mg/m^3 with an average maximum dry density of 1.80 Mg/m^3.

6.1.3 Bedrock – Weathered Spittal Flagstone Formation

Weathered Bedrock of the Spittal Flagstone Formation was present beneath the Glacial Till in all locations to a maximum exploratory location depth of 2.35 m bgl (67.00m AOD), whereby SPT refusals were encountered due to the hardness of the bedrock. Bedrock was typically characterised as being weathered and comprising weak dark grey FLAGSTONE, recovered as a clayey angular fine to coarse gravel.

Classification Testing

3 No. particle size distribution tests were undertaken on samples of the Weathered Spittal Flagstone Formation. The results of these tests are presented in **Appendix D**. The results suggest a predominantly granular material (sand/gravel/cobbles) with an average fines content of 5%.

Seven SPTs were undertaken within the Weathered Spittal Flagstone Formation. Six of the SPTs reached refusal with uncorrected SPT 'N' values of 50. A single SPT undertaken in BH06 at 1.20 m bgl achieved full penetration with a recorded SPT 'N' value of 10 which is indicative of medium dense granular residual soil of the weathered bedrock.

Angle of Shearing Resistance can be estimated from SPT's using the guidance from Peck, Hanson and Thornburn (1974) (8). Based on an SPT of 50, this gives an Angle of Shearing Resistance of 41°.

A characteristic unit weight of 19 kN/m^3 is recommended based on the guidance for a granular soil above the groundwater table.

6.2 Visual and Olfactory Indicators of Contamination

No visual or olfactory indicators of gross or mobile phase contamination were encountered within the Topsoil or underlying natural soils during the initial ground investigation.

6.3 Obstructions Encountered

No unexpected obstructions were encountered within any exploratory hole location throughout the duration of the ground investigations. All exploratory locations were terminated prior to target depth due to the presence of more competent bedrock.

The presence of further obstructions not identified by the ground investigations cannot be discounted.

6.4 Groundwater

12 No. groundwater strikes were encountered during the investigation, between 0.4 m and 1.8 m bgl (62.23 m and 67.58 m AOD respectively) across the Site. Due to the cohesive nature of the Glacial Till, and the granular Weathered Bedrock, these strikes are thought to be representative of 'perched groundwater' between superficial and bedrock strata.

The return monitoring visits did not record groundwater within the monitoring installations as shown in **Appendix D**.

6.5 Aggressive Ground Conditions

The classification of the site in terms of concrete in aggressive ground is based on the guidance provided in the Building Research Establishment (BRE) Special Digest 1 3rd Edition of 2017 (7). A summary of the results obtained during the ground investigation works are summarised in **Table 6.3a**.

Table 6.3a: *Summary of pH and water soluble (2:1) sulphate testing*

Stratum	Test Type	Range
Glacial Till	*pH*	*4.8 – 6.3*
	Water Soluble Sulphate (mg/l)	*10 - 38*

A total of 6 No. samples underwent water soluble sulphate and pH testing. Using BRE Special Digest 1, the Aggressive Chemical Environmental for Concrete (ACEC) classification has been derived from sulphate and pH values for each stratum. These are highlighted in Table 6.3b.

Table 6.3b: *Aggressive Chemical Environment for Concrete (ACEC) Site Classification*

Stratum	Design Sulphate Class	ACEC Class (1)
Diamicton, Till	*DS-1*	*AC-1*

(1) ACEC assessment was based on mobile groundwater condition in a greenfield scheme area.

7.0 Ground and Groundwater Contamination Risk Assessment

This section of the report includes the assessment of the potential solid contamination, liquid, and gas, identified on the subject site which may present a risk to the potential end users, associated utilities, and the wider environment.

In guidance published by the Environment Agency, the risk to human health or controlled waters is determined through an assessment of contaminant linkages between a source of contamination (within the ground or groundwater either on or off site) and a sensitive receptor such as end users of the site, building materials, edible plants grown in gardens or groundwater abstracted for drinking. This is termed a source-pathway-receptor relationship. The same model is applied to the assessment of risk arising from ground gases as detailed within BS8576:2013 (8).

These models have a common approach, which is one of a tiered assessment. At each stage of the assessment, further detail can be applied to the conceptual site model to provide a detailed interpretation on a site-by-site basis. As part of the planning process, this approach is adopted in order to establish either if the site is 'suitable for use' or whether additional work or else remedial work is required in order for the site to be deemed so.

The sub-sections hereafter therefore incorporate the first tier (Tier 1) of this approach otherwise referred to as the Generic Quantitative Risk Assessment (GQRA). The GQRA builds on the qualitative risk assessment presented in **Section 3.0**, in conjunction with observations made during the ground investigation and is based solely on the results of the chemical testing data obtained as part of Curtins Consulting's ground investigation.

The following sections present more detail on the risk assessment methodology rationale for the main receptors.

7.1 Human Health GQRA

Detailed guidance on human health risk assessment is available within several documents, published by both the Environment Agency and Defra. Guidance includes Contaminated Land Exposure Assessment (CLEA) v1.071 model Report SC050021/SR2: Human Health Toxicological Assessment of Contaminants in Soil and Report SC059921/SR3: Updated Technical Background to the CLEA Model (9).

A generic quantitative risk assessment (GQRA) has been carried out for the Potential Contaminant Linkages (PCLs) investigated by screening soil contamination data against relevant Generic Assessment Criteria (GAC) where available, including:

i) **Soil Guideline Values (SGVs):** These have been published by the Environment Agency and are trigger values for screening out low risk areas of land contamination. SGVs give an indication of representative average concentrations of chemicals in soil, below which long-term health risks are likely to be minimal. SGVs have been published for several contaminants including arsenic, cadmium, mercury, nickel, selenium, BTEX, phenols and dioxins, furans and dioxin-like PCB substances for land uses including residential, allotments and commercial. The SGVs have been developed for a sandy loam soil with 2.5% soil organic matter (SOM) content;

ii) **Supplementary Screening Values (SSVs):** In addition to the SGVs developed by the EA, other third-party organisations have derived SSVs for a wider range of contaminants and land uses using the CLEA Model. Curtins have adopted these numbers where applicable, including those developed by Atkins AtriskSoil™, the LQM/CIEH Suitable for Use Levels (S4UL) and EIC/AGS/CL:AIRE published thresholds;

iii) **Category 4 Screening Levels (C4SLs):** In March 2014 Defra published C4SLs for arsenic, benzene, benzo(a)pyrene, cadmium, hexavalent chromium, and lead. These values were derived to support the revised Part 2A Statutory Guidance issued in 2012 in which four categories of contaminated land are included, ranging from Category 1 (significant/high risk) to Category 4 (low risk). C4SLs are not representative of significant possibility of significant harm (SPoSH) and are low risk levels which, and therefore where the C4SLs are not exceeded, land can be demonstrated to be in Category 4 and cannot be determined as contaminated land.

The Proposed Development comprises the construction of a BESS, with associated access and drainage infrastructure.

This GQRA initially considers the following land use scenario for the development as part of a robust conservative assessment:

- Commercial

Details of the GACs adopted for the GQRA are provided in Appendix D.

7.1.1 Soils

As part of the investigation, a total of fourteen environmental samples from Topsoil were submitted for environmental testing based on a suite presented in Table 5.1.1. The distribution of samples and quantity of sampling is considered sufficient for the development site.

As discussed within the previous section, comparison of the soil analysis results has been undertaken against conservative Generic Assessment Criteria (GAC) based on a "*commercial*" end use.

Soil organic matter (SOM) has a strong bearing on the availability of potential contaminants and therefore influences the Tier 1 thresholds. The SOM typically ranged from 0.2% to 8.7%, with an average of 2.18%. As such, as part of a conservative assessment, the comparison has been made against GACs developed for a clayey soil with a SOM of 2.5%. The results of the environmental testing are appended in Appendix C. Copies of the adopted Tier 1 thresholds are contained within Appendix D.

With respect to the adopted conservative screening criteria for *commercial* end usage, the results of the screening did not identify any exceedances within samples submitted for chemical analysis. Consequently, on-site shallow soils are unlikely to present a risk to future site users.

7.1.2 Asbestos

A total of sixteen samples (Topsoil) were submitted to the laboratory for an asbestos presence screen. The testing concluded that asbestos containing materials were not positively identified in any of the samples submitted for laboratory testing.

7.1.3 Organochlorides

A total of two samples (topsoil and superficial deposits) were taken from a shallow hand pit undertaken in the vicinity of the area associated with the historical sheep dip. The samples were screened for organochlorides (typical contaminants associated with sheep dips). The testing concluded that no organochlorides were detected in any of the samples submitted for laboratory testing.

7.1.4 Groundwater Derived Vapours

Twelve shallow groundwater seepages were recorded on-site as part of the ground investigation. However, as previously discussed, no gross or mobile phase contamination was encountered within the natural soils during the ground investigation based on visual and olfactory observations. With this borne in mind, groundwater-derived vapours are unlikely to present a risk to future site users.

7.2 Water Environment – GQRA

Groundwater monitoring identified water to be present within the installations monitored as part of this ground investigation. Water levels were considered to be associated with perched water between the overlying superficial deposits and the underlying bedrock deposits, and this was not considered to be groundwater. In the absence of any groundwater recorded within the monitoring visits and the absence of groundwater abstraction for potable use within the influencing distance of the site, the risk to the groundwater environment is deemed to be Low owing to; the absence of potential sources of contamination and the overall limited nature of contamination to mobilise at Site based on the geological setting.

There are no surface water features within the Site boundary. It should also be noted that the off-Site surface water features (drainage burns to the north connected to the Burn of Horsegrow) also have the potential to be impacted by any surface water runoff from the Site. However, considering the absence of potential sources of contamination and the overall limited nature of contamination mobility revealed on Site from the geological setting, the risk to the surface water environment is deemed Low.

With reference to the above commentary, the risk to the controlled waters environment is assessed as Low and therefore there is no requirement for further action to assess the potential risk to the controlled waters environment.

7.3 Ground Gas – GQRA

The assessment of risk presented by ground gases is assessed with reference to guidance published by CIRIA Assessing Risks Posed by Hazardous Ground Gases to Buildings, C665, (10) BSI Publication code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings BS8485:2015+A1:2019 (11) and BS8576 (8)

The gas risk assessment adopts a tiered approach. In the first instance this involves a re-evaluation of the Conceptual Site Model described within the Phase 1 Preliminary Risk Assessment (desk study) and thereafter validating this conceptual model with the ground gas data, the semi-quantitative risk assessment.

7.3.1 Asphyxiant, Noxious and Explosive Gases

The Preliminary Conceptual Site Model (PCSM) presented within Section 3.0 noted the potential for gases to arise from uncontrolled deposition of Made Ground off-site. The ground investigation did not encounter any Made Ground across the site. The remainder of the site comprised Topsoil over natural soils with no organic or putrescible material. With reference to BS8576, Figure 6; the development site would be considered to have a 'very low' gassing potential.

Consequently, ground gas monitoring would not necessarily be required to further determine risk. However, to establish a baseline gas regime and validate the qualitative assessment of ground gas risk, seven dual-purpose gas and groundwater monitoring installations were constructed within boreholes as detailed in Table 4.3 within Section 4.3.

A programme of three gas and groundwater monitoring visits was proposed with visits undertaken on 12th March, 25th March and the 9th April 2024. Gas monitoring to date has been undertaken during steady and rising atmospheric pressures with barometric pressure ranging from 988 mb to 1010 mb. A summary of the soil gas monitoring results is presented in **Table 7.1** below, with the monitoring results presented in **Appendix D**.

Table 7.1: *Summary of Soil Gas Monitoring Results*

Location	CO_2 Range (% $^{vol}/_{vol}$)	CH_4 Range (% $^{vol}/_{vol}$)	O_2 (% $^{vol}/_{vol}$)	Max Flow Rate (l/hr)	Steady State Flow Rate (l/hr)
BH01	0.1	<0.1	20.3 – 20.8	<0.1	<0.1
BH02	0.1	<0.1	20.2 – 20.9	<0.1	<0.1
BH03	0.1	<0.1	20.2 – 20.5	<0.1	<0.1
BH04	0.1	<0.1	20.4 – 20.8	<0.1	<0.1
BH05	0.1	<0.1	20.8 – 21.0	<0.1	<0.1
BH06	0.1	<0.1	21.1	<0.1	<0.1
BH07	0.1	<0.1	20.4 – 20.6	<0.1	<0.1

Hydrogen sulphide and carbon monoxide were not detected during any of the ground gas monitoring visits.

Maximum concentrations of carbon dioxide and methane were recorded at 0.1% $^{vol}/_{vol}$ and <0.1% $^{vol}/_{vol}$ respectively. The ground gas concentrations are consistent with natural soils with no organic/putrescible material recorded. As previously detailed, the above is considered to comprise 'very low' gassing potential in accordance with BS8576 Figure 6.

Considering both a 'worst credible scenario' (maximum 'absolute' flow rate, maximum gas concentration within a single borehole location) and 'worst possible scenario' (maximum 'absolute' flow rate, maximum gas concentration across all borehole locations) the Hazardous Gas Flow Rates (Q_{hg}) for the site are evaluated as 0.0001 (carbon dioxide) and <0.0001 (methane).

In this site situation, the calculated Hazardous Gas Flow Rates (Q_{hg}) are considered to be reflective of a conservative assessment of Gas Screening Values (GSV) with generally negligible flow rates and non-detectable concentrations of methane recorded.

With reference to CIRIA C665 (10), the above calculated GSV, indicate a Characteristic Situation (CS) 1 in regard to ground risk. Ground gas is not considered to be a potential risk at the development site.

7.4 Radon Gas

The BGS Radon Mapping (Ref.5) confirms the site is situated in radon area where >5-10% of homes are at or above the radon action level. On this basis basic radon protection measures are considered likely in the construction of any enclosed spaces.

8.0 Revised Conceptual Site Model

The preliminary conceptual site model (PCSM) presented and discussed in **Section 3.0** of this report has been revised following the GQRA in **Section 7.0** above and this revised Conceptual Site Model (CSM) is presented in the table overleaf.

The CSM details the source-pathway-receptor linkages or potential contaminant linkages (PCL) that have been identified for the site. The GQRA details the associated level of risk relating to these potential contaminant linkages.

The CSM concerns risk to human health, Water and Environment and follows the framework outlined within CIRIA C552 which is summarised within **Appendix E**.

The 'risk rating' within the CSM refers to the risk that the source, pathway, receptor linkage or PCL is complete. Unless specifically stated it does not necessarily refer to an immediate risk and is intended to be used as a tool to assess the necessity for further assessment/investigation.

Under current health and safety legislation, employers are required to carry out their own appropriate risk assessments and mitigation to protect themselves and their employees, other human receptors and the environment from potential contamination. Such risks must be adequately mitigated by law, specifically the Construction Design Management (CDM) Regulations, 2015 which require that potential risks to human health and the environment from construction activities are appropriately identified and all necessary steps taken to eliminate/manage that risk. It has been assumed that any future construction works on site will be undertaken in compliance with these requirements and therefore construction workers involved in the building works at the site have been discounted as a human receptor in the conceptual site model.

- **Table 8.1** below represents the second stage in the land quality risk assessment process: The Quantitative Risk Assessment.
- In order for a development site to be deemed 'suitable for use', the level of risk needs to be brought down to acceptable levels, i.e., low to negligible risk. The purpose of each stage of risk assessment is ultimately to establish, if there is a requirement for additional levels of assessment to be made in order to have sufficient confidence to support a risk characterisation or management decision, e.g. remedial action.

Conceptual Site Model			Qualitative Risk Assessment			Recommended Actions
Source	**Pathway(s)**	**Receptor(s)**	**Consequence**	**Likelihood of Occurrence**	**Risk Rating**	
Made Ground and contamination associated with the Sheep Dip. **Fuel Spills from farming equipment during farming activities on the Site.**	**Direct contact, ingestion,** inhalation (dust and vapours).	**Site end-user**	**Medium** Acute health risk	**Low** Made Ground was not encountered onsite. Samples of onsite shallow natural soils sent for chemical testing did not identify any chemical exceedances against commercial GACs. The areas of the historical sheep dip area was investigated via a shallow hand pit. Samples were retrieved and sent for chemical testing of organochlorides and did not identify any chemical exceedances against commercial GACs.	**Low**	**No further action required**
	Vertical migration through the superficial deposits (soils) May occur due physical processes including; capillary action and downwards into the natural deposits through infiltration, however, on Site deposits are likely to be cohesive in nature, reducing the potential for vertical migration.	**Water Environment (groundwater)** Unclassified Aquifer. No active/in use potable abstraction points located within the vicinity of the site.	**Mild** Pollution of sensitive water resources	**Low** Made Ground was not encountered onsite. Twelve groundwater strikes were recorded during the investigation; these were characterised as perched water and not representative of a sensitive resource. Samples of onsite shallow natural soils sent for chemical testing did not identify any chemical exceedances against commercial GACs, in addition no visual or olfactory contamination was encountered onsite. Consequently, the risk to controlled waters is deemed as low.	**Low**	
	Horizontal migration over and through the superficial deposits (soils).	**Water Environment (surface water)** Burn of Horsegrow	**Medium** Pollution of sensitive water resources		**Low**	
Production of ground generating gases from: Made ground from infilled quarries to the south and west of the Site.	**Vertical and horizontal migration** through existing service corridors and the underlying superficial deposits.	**Site end-user**	**Medium** Human health risk	**Low** As previously discussed, the main sources of ground gas generation were located off-site (former quarries). Monitoring wells were installed across the Site and close to the west and south boundaries of the Site in order to encapsulate any migrating ground gases. With reference to BS8576, Figure 6 such material would have 'very low' gassing potential and unlikely to contribute a site-wide ground gas risk. Subsequent monitoring data did not identify significant levels of ground gas. Consequently, ground gas protection measures are not required on-site.	**Low**	**No further action required**

In conclusion, the previous Revised Risk Assessment indicates a **Low** risk to human health, controlled waters, and ground gas from on and off-site.

9.0 Preliminary Geotechnical Assessment

The recommendations provided within this section are based on a review of the recent records of ground conditions encountered across the site, along with the proposed development. This section will assess the relevant geotechnical issues for the proposed development. The proposed development plan is contained within **Appendix A**. The engineering assessment considers:foundation design, bearing capacity, settlement, excavations, earthworks, and pavement design for the site. It should be noted that details may change in the development of designs beyond the issue of this Phase 2 GI Report and the construction-stage designer should satisfy themselves regarding the adequacy of their design and proposed approach to construction by reference to the ongoing project design proposals, the ground investigation information, and their own examination of the site.

9.1 Geotechnical Considerations

9.1.1 Topography

Across the proposed Battery Compound, over a distance of 264 m, there is currently a difference in elevation of 11.5 m from 62 m AOD in the north-west and 73.5 m in the south-east, which gives a slope angle of approximately 2.5°.

9.1.2 Compressible and Variable Thickness Superficial Deposits

The Glacial Till was encountered as soft to stiff brown and grey mottled orange slightly silty slightly sandy slightly gravelly CLAY between 0.30 m and 1.80 m thick. 2 No. SPTs were carried out in the Glacial Till, giving N-values of 11 and 45 at elevations of 68.16 m and 61.43 m AOD, respectively.

Under shallow foundation loading, cohesive soils are likely to undergo settlement. Over the design life of the buildings, this loading can lead to excess pore water pressure dissipation leading to consolidation settlement. In order to determine suitability for shallow raft foundations, further in situ testing and Atterberg Limit testing need to be carried out to confirm the strength and consolidation parameters. Further to this a settlement assessment would be required.

9.1.3 Shrinkable Soils

As per the NHBC Chapter 4.2 (2024), “Shrinkable soils, often change volume as moisture content fluctuates seasonally and as a result of factors, including the action of tree roots. The resulting shrinkage or swelling can cause subsidence or heave damage to foundations, the structures they support and services”. Given the cohesive nature of the Glacial Till, there is a potential of volume change potential that may affect the proposed foundations and floor slab.

The PSD results for the Glacial Till indicate a very clayey sand, where shrink/swell would not be an issue and there are currently no Atterberg Limit tests available to confirm whether the soils are cohesive. It is recommended that further trial pitting is carried out in order to carry out Atterberg Limit tests to confirm this.

9.2 Earthworks

For the proposed earthworks, cut and fill will be required to achieve formation level due to the sloping nature of the Site and presence of shallow bedrock.

9.2.1 Reuse of Site Won Materials

Earthworks should be undertaken in accordance with Series 600 of the Specification for Highways Works (SHW). Cut materials will comprise the Glacial Till and/or weathered bedrock (Spittal Flagstone Formation – Flagstone).

It is considered that the excavated material could be classified as a Class 1 or Class 2 Acceptable Earthworks Fill (in accordance with Table 6/2 SHW Series 600) subject to the receipt of further testing undertaken in accordance with a site specific earthworks specification. A summary of the grading results is provided in **Table 9.1** together with the determined material classification (assuming oversize material removed).

Table 9.1: *Summary of PSD test results and appropriate material classification*

Sample	Depth	500	300	125	90	75	37.5	28	20	14	10	6.3	5	3.35	2	1.18	600	300	150	63	Class
TP01	0.6	100	100	100	100	100	98	98	97	96	95	95	94	93	92	90	88	84	69	44	2C
TP03	1.25	100	100	100	68	45	9	7	6	6	6	6	5	5	5	5	5	5	4	3	1A
TP05	1.5	100	100	100	100	100	100	98	98	94	93	91	90	88	86	84	81	76	59	37	2C
TP07	1	100	100	100	100	100	100	99	99	96	95	92	91	90	89	87	84	80	66	47	2C
TP10	0.6	100	100	100	100	100	100	98	95	93	91	88	87	85	83	81	78	78	70	50	2C
TP11	0.6	100	100	100	88	82	73	39	30	24	20	16	15	14	12	11	11	10	8	7	1A
TP15	0.6	100	100	100	100	100	100	100	99	98	97	95	95	94	93	92	90	85	66	38	2C
TP17	0.25	100	100	100	100	100	100	100	98	98	97	97	96	96	95	93	84	69	55	20	2C
TP18	1	100	100	100	100	100	99	97	96	95	94	92	91	90	88	86	83	80	61	40	2C
TP21	0.3	100	100	100	100	100	100	94	94	90	88	86	85	84	82	77	66	54	33	15	1A&1B
TP23	1.2	100	100	100	100	100	93	83	66	56	49	44	41	39	36	33	30	27	24	20	2C
TP25	0.9	100	100	100	100	100	100	100	100	99	98	97	96	96	95	93	90	82	65	43	1A&1B
TP27	1	100	100	100	100	100	83	74	59	52	47	42	40	38	37	35	33	31	25	16	2C
BH01	0.8	100	100	100	100	100	100	100	100	100	99	98	97	96	95	94	90	83	65	39	2C
BH05	1.8	100	100	100	100	100	90	89	88	86	85	83	83	82	81	78	70	63	49	32	2C
BH06	1.8	100	100	100	100	100	95	78	62	54	44	36	34	27	27	25	23	21	19	17	2C
BH07	1.2	100	100	100	100	100	100	100	97	96	93	87	85	82	77	75	73	71	63	57	2C
AVERAGE		100	100	100	97	96	91	86	81	78	76	73	72	71	69	67	63	59	47	31	2C

Subject to the removal of oversize material (>125 mm), the results suggest that the excavated Glacial Till is likely to classify as a Class 2 Acceptable Earthworks Material in accordance with the SHW Series 600, Table 6/2. Based on the PSD test results, the weathered bedrock (Spittal Flagstone Formation) could be classified as a Class 1 Acceptable Earthworks Material although, as with the Glacial Till, this is to be confirmed by the appropriate geotechnical testing carried out in accordance with a detailed earthworks specification written in accordance with SHW Series 600.

Testing of Glacial Till suggests that the moisture content is too high (wet of optimum moisture content) in order to achieve adequate compaction. Therefore, a degree of drying out is likely to be required in order to compact the material sufficiently below structures or external areas. Excavating the soils during earthworks will naturally cause a degree of drying out, it is recommended that the stockpiled soils are retested to ascertain their moisture content prior to placement. If the moisture content is still too high, lime or a cement-based agent could be used to reduce the moisture content to acceptable levels subject to discussions with a suitable ground improvement expert / lime stabilisation company. Acceptable levels for compaction should be reported in a site-specific Earthworks Specification.

9.3 Foundation Design

9.3.1 Shallow Foundations

The proposed development comprises a battery storage facility with a maximum expected loading of 50 kN/m^2 and a transformer with a maximum loading of 120 kN/m^2.

Shallow foundations are considered to be feasible for this site, pending confirmation of structural loadings and layouts. It is recommended that foundations are extended through any cohesive superficial deposits into the Granular weathered Flagstone soils encountered at depths ranging between 61.03 m AOD and 72.06 m AOD.

A conservative bearing capacity check has therefore been for the Weathered Flagstone using guidance from Tomlinson (2001), Hansen (1968), Bowles (1988) and Eurocode 7: Geotechnical Design to confirm feasibility. Based on an angle of Shearing Resistance of 41°, for a 1.5m x 1.5 m pad foundation, at a minimum of 1.1 m bgl, a bearing capacity of approximately 150 kPa is estimated within the Weathered Bedrock.

In areas where thicker cohesive strata are anticipated (due to the sloping nature of the site) over-excavation and replacement with competent granular fill material will be required in order to achieve adequate bearing capacities and limit differential settlements. Foundations should not be formed or spread across mixed cohesive and granular soils.

9.3.2 Raft Foundations

For a proposed raft foundation, a minimum 750 mm of Class 6F2/6F5 granular fill would need to be placed beneath the slab (assuming a low volume change potential within the Cohesive Glacial Till) with Class 2 general fill placed down to the weathered bedrock of the Spittal Flagstone Formation. All fill materials should be placed and compacted to an earthworks specification. N.B. the low volume change potential described above is based on engineering judgement in this area of Scotland including investigations in similar over consolidated glacial till soils and descriptions of the soil but is subject to receipt of further testing.

A detailed settlement assessment should also be undertaken to confirm the material parameters required for the fill, to detail the compaction requirements, determine the appropriate thickness of Class 6F2/6F5 granular fill beneath the raft and to ensure settlements are not excessive.

9.3.3 Ground Floor Slab

Assuming excavation and replacement of the softer and cohesive soils will be undertaken and all structural fill will be tested and placed strictly in accordance with an appropriate earthworks specification, then ground bearing floor slabs founding in the Granular bedrock deposits or Granular Engineered Fill are considered to be feasible. Consideration would need to be given to potential total and differential settlements.

Prior to the placement of the founding materials and the construction of the ground bearing floor slab, the formation will need to be inspected and checked by a suitably qualified engineer to ensure the ground conditions are as expected.

9.4 Groundwater and Excavations

It is anticipated that earthworks will be required during the enabling works and shallow excavations during the construction phase. During the Site investigation it was noted that rock was relatively easily excavated by the tracked excavator in the upper 100 mm but proved more resilient with depth. Coring of the bedrock was out of the scope of this investigation. Further ground investigation would be required in order to confirm the strength of the bedrock with depth through logging and the appropriate testing.

Seepages within the superficial Glacial Till cannot be discounted and may be present in shallow excavations.

The trial pits carried out on site appeared to be stable during excavations. However, this may be different during the construction phase due to unknown variables such as heavy rain and higher groundwater. In accordance with Health and Safety Regulations, side support for safety purposes should be provided to all excavations which appear unstable and those more than 1.2 m deep. Excavations are likely to be stable at suitable batters.

Noticeable amounts of standing water encountered within the excavations could result in weakening of the founding soils. As such, where encountered, the water should be removed facilitating suitable methods such as sump pumping.

General advice on de-watering in accordance with CIRIA Report C750: Groundwater Control (12) should be taken into consideration. The chosen contractor should provide details on how they intend to ensure the safety and stability of proposed excavations.

9.5 Hardstanding Design

CBR values are used to determine road pavement construction thicknesses with the following results:

- 2 No. in-situ Lightweight Deflectometer (LWD) tests were carried out to depth of between 0.67m bgl (71.51m AOD) and 1.14m bgl (58.64m AOD). 19 No. CBR results were provided across the depth range in these depths ranging from 1.4% to >20%.
- Laboratory CBR testing was undertaken on 5 No. soil samples retrieved from depths of 0.50m to 1.00m bgl, with results ranging from 0.1% to 1.0% with an average CBR of 0.68%.

As the final location, layout and engineering level of proposed structure maybe subject to change and given the tests were affected by cobbles within the Glacial Till and high moisture contents in the laboratory (which would be controlled in earthworks) it will be necessary for further, updated CBR tests to be undertaken at detailed design and on prepared sub-formation prior to the construction of any road pavement areas.

At this stage and based on the CBR results carried out and where near surface natural soils are encountered at road pavement formation levels, a California Bearing Ratio of <2.5% can be assumed and full road capping should be allowed for to mitigate total and differential settlements. This could be varied where natural deposits are encountered during construction. Atterberg Limit testing of the Glacial Till should also be carried out to make a full assessment.

The above is subject to in situ testing during construction. Any soft or loose layers encountered in otherwise competent formations should be removed and replaced with well compacted imported granular fill.

The engineering characteristics of any clayey and silty soils at shallow depth are particularly sensitive to changes in soil moisture content and will soften considerably when exposed to free water. It would therefore be prudent to program pavement construction for the dry summer months where possible. Where this is not possible, steps should be taken to protect construction activities in adverse weather, for example not placing any fill until compaction plant is on site to work it and excavating grips or temporary drainage ditches to collect run off and/ or groundwater during periods of particularly heavy rain.

9.6 Drainage

The preliminary in-situ soakaway tests carried out as part of the site investigation works indicated poor infiltration characteristics of the underlying glacial deposits being unsuitable for soakaway infiltration. It should be noted that these tests were carried out for the purposes of early feasibility assessments only and were not fully compliant with BRE 365 as the 75% and 25% drop in water levels were not achieved.

It is recommended that if soakaway infiltration is proposed as part of the development (for example within the bedrock soils), confirmatory soakage testing is undertaken at proposed the specific intended soakaway locations and mimicking the proposed volumes/depths, once the drainage design is finalised.

10.0 Conclusions

10.1 Conclusions

A revised tabulated Conceptual Site Model has been derived following the findings of the Generic Quantitative Risk Assessment and is presented in Section 8.0.

The environmental chemistry soil results have been compared with the Generic Assessment Criteria (GAC) for soils with respect to human health against "*commercial*" land use thresholds. The results of environmental testing did not record any exceedances of contaminants above the adopted GACs nor the presence of asbestos and elevated concentrations of organochlorides.

The contamination risk to controlled waters, both groundwater and surface water, is considered to be Low.

The risk to end users from ground gases was considered to be Low. A review of the ground gas risk highlights no ground gas protection measures are required for the Site, however. the BGS Radon Mapping confirms that the site in a moderate probability radon area where less than 5-10% of homes are estimated to be at or above the action level. Therefore basic radon protective measures are necessary in the construction of any enclosed spaces.

If the new development incorporates a basement the advice of a specialist Radon assessor must be obtained.

Specific trial digs encountered Topsoil described as peaty but not considered Peat due to visual identification of higher inorganic components (sand and clay). As such, a peat management plan is not required for the Site.

The bedrock underlying the Site is considered a suitable founding stratum due to the shallow depth beneath existing ground level and an estimated allowable bearing capacity of 150 kPa for a 1.5 m x 1. 5m pad foundation at a minimum depth of 1.1m bgl.

For a proposed raft foundation, a minimum 750 mm of Class 6F2/6F5 granular fill would need to be placed beneath the slab (assuming a low volume change potential within the Cohesive Glacial Till) with Class 2 general fill placed down to the weathered bedrock of the Spittal Flagstone Formation. All fill materials should be placed and compacted to an earthworks specification. N.B. the low volume change potential described above is based on engineering judgement in this area of Scotland including investigations in similar over consolidated glacial till soils and descriptions of the soil but is subject to receipt of further testing. A detailed settlement assessment should also be undertaken to confirm the material parameters required for the fill, to detail the compaction requirements, determine the appropriate thickness of Class 6F2/6F5 granular fill beneath the raft and to ensure settlements are not excessive

The preliminary in-situ soakaway tests carried out as part of the site investigation works indicated poor infiltration characteristics of the underlying glacial deposits being unsuitable for soakaway infiltration. It is recommended that if soakaway infiltration is proposed as part of the redevelopment (for example within the bedrock soils),

confirmatory soakage testing is undertaken at proposed the specific intended soakaway locations and mimicking the proposed volumes/depths, once the drainage design is finalised

At this stage and based on the CBR results carried out and where near surface natural soils are encountered at road pavement formation levels, a California Bearing Ratio of <2.5% can be assumed and full road capping should be allowed for to mitigate total and differential settlements. Further in-situ CBR testing should be undertaken at formation level where hardstanding is proposed to confirm the CBR value used in preliminary design

10.2 Recommendations

In light of the ground investigation undertaken to date across the development site, the following recommendations are made:

- Further trial pitting should be carried out in order to obtain samples within the Glacial Till for Atterberg Limit testing. Once complete, this report should be revisited and the proposed foundation build ups updated accordingly.
- Earthworks should be undertaken in accordance with an Earthworks Specification and a detailed settlement assessment is likely to be required for a raft foundation on Engineered Fill;
- Additional CBR tests on the subgrade are recommended post cut/fill to determine if ground improvement is required (if CBR is <2.5%);
- It is recommended that no further environmental works are considered necessary and based on this information a remediation strategy is not considered necessary.

11.0 References

1. **Curtins.** *Rigifa, Phase 1 Preliminary Risk Assessment (ref. 085499-CUR-00-XX-RP-GE-00001).* July 2024 (P04 September 2024).

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7. **BRE.** *BRE Special Digest 1 (SD1:2005), Concrete in aggresive ground, 3rd Edition.* 2017.

8. *BS8576 - Guidance on investigations for ground gas - Permanent gases and Volatile Organic Compounds (VOCs).* **British Standards.** 2013.

9. **Environment Agency.** *Updated Technical Background to the CLEA Model (SR3).* January 2009.

10. **CIRIA.** *Assessing Risks Posed by Hazardous Ground Gases to Buildings (report no. C665).* 2007.

11. **British Standards.** *British Standard 8485:2015+A1:2019 - Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings .* 2015.

12. **CIRIA.** *C750 Groundwater control - design and practice.* 2016.1

13. *Assessing risks posed by hazardous ground gases to buildings (C665).* **Construction Industry Research and Information Association (CIRIA).** 2007.

14.**Tomlinson** *Foundtion Design and Construction (7th Edition).* 2001

12.0 Appendices

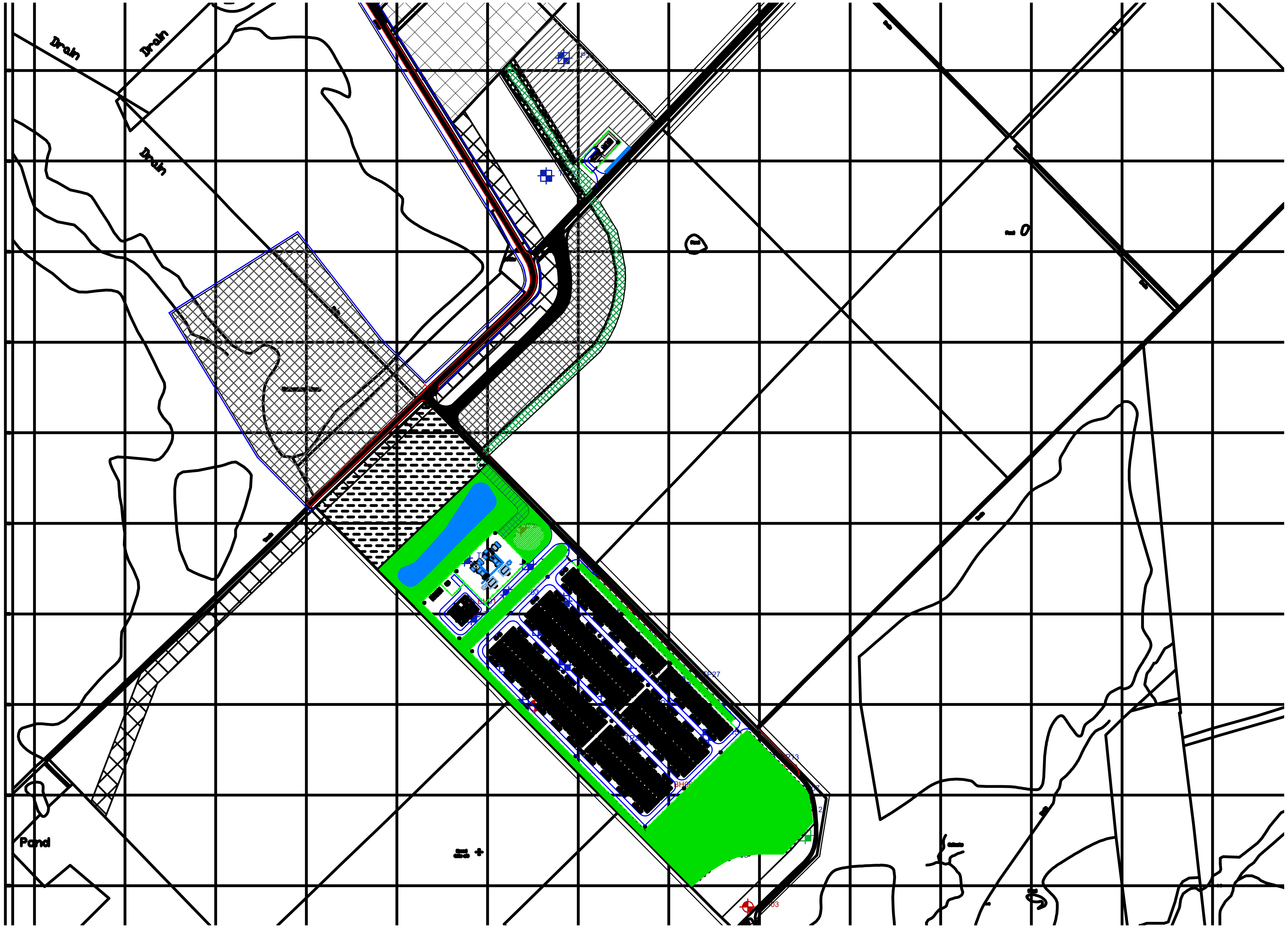
Appendix A – Drawings

Appendix B – Borehole Logs

Appendix C – Laboratory Testing Results

Appendix D – Qualitative Risk Assessment Rationale

Appendix A - Drawings



Key

Cable Percussive Boreholes CP

Machine Excavated Trial Pits TP

Soakaway Tests SA

REV	ISSUED	00/00/00	XXX	XXX
Rev:	Description:	Date:	By:	Chkd:

Curtins

Office
Telephone
Email
Web

Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Project: RIGIFA

Drg Title: FINAL GROUND INVESTIGATION LOCATIONS

Status: FINAL

Drawn By	MTL	Checked By	CD
Designed By	MTL	Date	12/04/24
Scales @ A3	NTS		

Project No - Originator - Function - Spatial - Form - Discipline - Number	Revision
085449 - CUR - XX - RG - D - GE - 00002	P01

\\ed-fs-1\Projects\Vision Job Numbers\085449 - Rigifa, Thurso\Q4-Production\4A-Models-Drawings\GE\CAD\XREF\

Key

Cable Percussive Boreholes	CP
Machine Excavated Trial Pits	TP
Soakaway Tests	SA

REV	ISSUED	00/00/00	XXX	XXX
Rev:	Description:	Date:	By:	Chkd:

Curtins

Office
Telephone
Email
Web

Project:	RIGIFA
Drg Title:	CUT & FILL SITE LAYOUT
Status:	FINAL
Drawn By	MTL
Checked By	CD
Designed By	MTL
Date	09/07/24
Scales @ A3	NTS

Project No - Originator - Function - Spatial - Form - Discipline - Number

085449 - CUR - XX - RG - D - GE - 00003

Revision P01

\\ed-fs-1\Projects\Vision Job Numbers\085449 - Rigifa, Thurso\Q4-Production\4A-Models-Drawings\GEICAD\XREF\

Appendix B – Borehole Logs

Drilling Ltd

Borehole Log

Borehole No. **BH01**

Sheet 1 of 1

Project Name:	Rigifa	**Project No.** GD 0726	**Co-ords:**	E: 329283.3 N: 971101.7	**Hole Type** WS
Location:	Thurso		**Level:**	64.24	**Scale** 1:25
Client:	Curtins		**Dates:**	20/02/2024	**Rig Type** Competitor Dart

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.20	64.04		Dark brown clayey sandy peaty TOPSOIL with frequent vegetation.
		0.30	B					Soft to firm brown and grey mottled orange slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subangular fine to coarse of various lithologies including flagstone.
		0.50	ES					
		0.80	B					
		1.00	ES		1.05	63.19		Weak dark grey FLAGSTONE, recovered as a clayey angular fine to coarse gravel.
		1.20 - 1.30 1.20	D SPT	50 (25 for 100mm/50 for 0mm)	1.30	62.94		*No further progress, presumed bedrock.* End of Borehole at 1.30m

1 2 3 4 5

Remarks:

Inspection pit dug to a depth of 1.20m. Borehole progressed with windowless sampling techniques to a depth of 1.30m and terminated on presumed bedrock. No groundwater encountered. Borehole fitted with a wellpoint on completion.

Logged By:	Checked By:
GD	

Drilling Ltd

DRAFT

Drilling Ltd

Borehole Log

Borehole No. **BH02** Sheet 1 of 1

Project Name:	Rigifa	**Project No.** GD 0726	**Co-ords:**	E: 329607.7 N: 970928.2	**Hole Type** WS
Location:	Thurso		**Level:**	73.16	**Scale** 1:25
Client:	Curtins		**Dates:**	21/02/2024	**Rig Type** Competitor Dart

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	ES		0.25	72.91		Dark brown clayey sandy peaty TOPSOIL with frequent vegetation.
		0.50	B					Soft to firm dark brown slightly sandy gravelly CLAY. Gravel is angular fine to coarse of predominantly flagstone.
		0.50	ES					
		1.00	B					
		1.00	ES		1.10	72.06		
		1.20 - 1.65	D					Weak dark grey FLAGSTONE, recovered as an angular fine to coarse gravel.
		1.20	SPT	N=12 (2,3/3,3,3,3)				
		1.80	B					
		1.90	SPT	50 (25 for 0mm/50 for 0mm)	1.90	71.26		*No further progress, presumed bedrock.* End of Borehole at 1.90m

1 2 3 4 5

Remarks:

Inspection pit dug to a depth of 1.20m. Borehole progressed with windowless sampling techniques to a depth of 1.90m and terminated on presumed bedrock. No groundwater encountered. Borehole fitted with a wellpoint on completion.

Logged By:	Checked By:
KP	

Drilling Ltd

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Borehole Log

Drilling Ltd

Borehole No. BH03

Sheet 1 of 1

Project Name:	Rigifa	**Project No.** GD 0726	**Co-ords:**	E: 329587.2 N: 970776.5	**Hole Type** WS
Location:	Thurso		**Level:**	70.58	**Scale** 1:25
Client:	Curtins		**Dates:**	21/02/2024	**Rig Type** Competitor Dart

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	ES		0.20	70.38		Dark brown clayey sandy TOPSOIL with frequent vegetation.
		0.50 0.50	B ES					Soft brown and grey slightly silty slightly sandy gravelly CLAY with occasional plant debris. Gravel is subangular and angular fine to coarse of predominantly flagstone.
		1.00 1.00	B ES		1.10	69.48		
	▼	1.20 - 1.65 1.20	D SPT	N=17 (3,2/3,3,5,6)				Weak dark grey FLAGSTONE, recovered as an angular fine to coarse gravel.
		1.90 1.90 - 2.10 1.90	B D SPT	50 (25 for 100mm/50 for 100mm)	2.10	68.48		*No further progress, presumed bedrock.* End of Borehole at 2.10m

Remarks:

Inspection pit dug to a depth of 1.20m. Borehole progressed with windowless sampling techniques to a depth of 2.10m and terminated on presumed bedrock. Seepage at 1.40m. Borehole fitted with a wellpoint on completion.

Logged By:	Checked By:
KP	

Drilling Ltd

DRAFT

Borehole Log

Drilling Ltd

Borehole No. **BH04**

Sheet 1 of 1

Project Name:	Rigifa	**Project No.** GD 0726	**Co-ords:**	E: 329429.1 N: 971100.0	**Hole Type** WS
Location:	Thurso		**Level:**	70.07	**Scale** 1:25
Client:	Curtins		**Dates:**	20/02/2024	**Rig Type** Competitor Dart

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.30	69.77		Dark brown clayey sandy peaty TOPSOIL with frequent vegetation.
		0.50 0.50	B ES		0.60	69.47		Brown slightly gravelly very clayey fine to medium SAND. Gravel is subangular fine to coarse of various lithologies.
		1.00 1.00	B ES		1.10	68.97		Firm brownish grey slightly sandy very gravelly CLAY. Gravel is angular and subangular fine to coarse of predominantly flagstone.
		1.20 - 1.55 1.20	D SPT	50 (12,13/50 for 200mm)	1.55	68.52		Weak dark grey FLAGSTONE, recovered as an angular fine to coarse gravel.
								No further progress, presumed bedrock.
								End of Borehole at 1.55m

1 2 3 4 5

Remarks:

Inspection pit dug to a depth of 1.20m. Borehole progressed with windowless sampling techniques to a depth of 1.55m and terminated on presumed bedrock. No groundwater encountered. Borehole fitted with a wellpoint on completion.

Logged By:	Checked By:
KP	

Drilling Ltd

DRAFT

Drilling Ltd

Borehole Log

Borehole No. **BH05**

Sheet 1 of 1

Project Name:	Rigifa	**Project No.** GD 0726	**Co-ords:**	E: 329352.2 N: 970998.7	**Hole Type** WS
Location:	Thurso		**Level:**	69.36	**Scale** 1:25
Client:	Curtins		**Dates:**	20/02/2024	**Rig Type** Competitor Dart

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.30	69.06		Dark brown clayey sandy peaty TOPSOIL with frequent vegetation.
		0.50 0.50	B ES					Soft to firm becoming firm brown and grey mottled orange slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subangular fine to coarse of various lithologies including flagstone.
		1.00 1.00	B ES					
		1.20 - 1.65 1.20	D SPT	N=11 (2,3/3,2,3,3)				
	▼	1.80	B		1.80	67.56		Stiff dark grey slightly sandy gravelly CLAY. Gravel is angular fine to coarse of predominantly flagstone.
		2.00 - 2.35 2.00	D SPT	50 (8,14/50 for 200mm)	2.10	67.26		Weak dark grey FLAGSTONE, recovered as a clayey angular fine to coarse gravel.
					2.35	67.00		*No further progress, presumed bedrock.* End of Borehole at 2.35m

1 2 3 4 5

Remarks:

Inspection pit dug to a depth of 1.20m. Borehole progressed with windowless sampling techniques to a depth of 2.35m and terminated on presumed bedrock. Seepage at 1.80m. Borehole fitted with a wellpoint on completion.

Logged By:	Checked By:
KP	

Drilling Ltd

DRAFT

Drilling Ltd

Borehole Log

Borehole No. **BH06**

Sheet 1 of 1

Project Name:	Rigifa	**Project No.** GD 0726	**Co-ords:**	E: 329492.1 N: 970909.2	**Hole Type** WS
Location:	Thurso		**Level:**	72.10	**Scale** 1:25
Client:	Curtins		**Dates:**	21/02/2024	**Rig Type** Competitor Dart

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.20	71.90		Dark brown clayey sandy TOPSOIL with frequent vegetation.
	▼	0.50 0.50	B ES					Soft grey slightly gravelly CLAY with occasional plant debris. Gravel is subangular and angular fine to coarse of predominantly flagstone.
		1.00 1.00	B ES		0.90	71.20		Weak dark grey FLAGSTONE, recovered as a clayey angular fine to coarse gravel.
		1.20 - 1.65 1.20	D SPT	N=10 (2,2/3,2,3,2)				
		1.80 1.80 - 1.90 1.80	B D SPT	50 (25 for 50mm/50 for 50mm)	1.90	70.20		*No further progress, presumed bedrock.* End of Borehole at 1.90m

Remarks:

Inspection pit dug to a depth of 1.20m. Borehole progressed with windowless sampling techniques to a depth of 1.90m and terminated on presumed bedrock. Water strike at 0.70m and remaining at this level after 20mins. Borehole fitted with a wellpoint on completion.

Logged By:	Checked By:
KP	

Drilling Ltd

DRAFT

Drilling Ltd

Borehole Log

Borehole No. **BH07**

Sheet 1 of 1

Project Name:	Rigifa	**Project No.** GD 0726	**Co-ords:**	E: 329336.6 N: 971195.3	**Hole Type** WS
Location:	Thurso		**Level:**	62.63	**Scale** 1:25
Client:	Curtins		**Dates:**	20/02/2024	**Rig Type** Competitor Dart

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.30	62.33		Dark brown clayey sandy peaty TOPSOIL with frequent vegetation.
	▼	0.50 0.50	B ES					Firm brown and grey slightly sandy slightly gravelly CLAY with occasional plant debris. Gravel is subangular fine to coarse of various lithologies.
		1.00	ES		1.10	61.53		
		1.20 - 1.60 1.20 - 1.65 1.20	B D SPT	N=45 (1,8/9,13,11,12)				Stiff dark grey slightly sandy gravelly CLAY. Gravel is angular fine to coarse of predominantly flagstone.
		1.65	SPT	50 (25 for 0mm/50 for 0mm)	1.60 1.65	61.03 60.98		Weak dark grey FLAGSTONE, recovered as an angular fine to coarse gravel. *No further progress, presumed bedrock.* End of Borehole at 1.65m

1 2 3 4 5

Remarks:

Inspection pit dug to a depth of 1.20m. Borehole progressed with windowless sampling techniques to a depth of 1.65m and terminated on presumed bedrock. Water strike at 0.40m and remaining at this level after 20mins. Borehole fitted with a wellpoint on completion.

Logged By:	Checked By:
GD	

Drilling Ltd

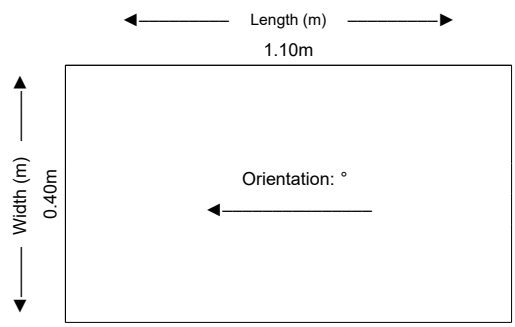
DRAFT

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: SA01
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
				(0.30) 0.30		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				(0.80) 1.10		Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
						End of Trial Pit at 1.10m		

Dimensions:

Final Depth: 1.10m



Inclination: 90°

General Remarks:

No groundwater encountered. Soakaway test carried out from base of pit.

Water Strikes

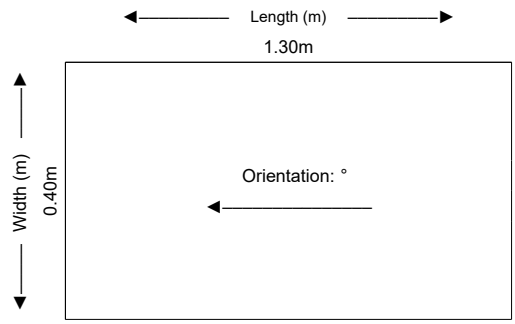
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: SA02
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers		Hole Termination: Terminated on rock or boulder obstruction		Stability: stable	Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
				(0.35)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				0.35		Light orangish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone. Pockets of clayey sand.		
				0.60		Dark brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				(0.60)				
				1.20		End of Trial Pit at 1.20m		

Dimensions:

Final Depth: 1.20m



Inclination: 90°

General Remarks:

No groundwater encountered. Soakaway test carried out from base of pit.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

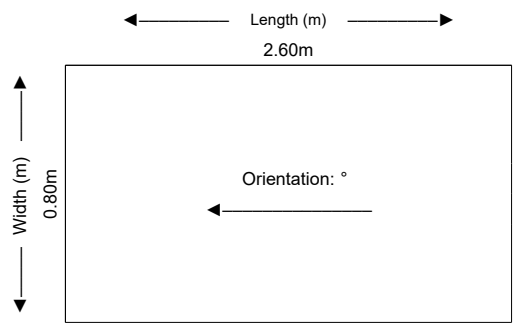
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP01
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25

Weather: Sunny with showers | Hole Termination: Terminated on rock or boulder obstruction | Stability: stable

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				0.30				
0.50	ES					Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
0.60	B							
0.60	D			(0.90)				
				1.20		End of Trial Pit at 1.20m		

Dimensions:

Final Depth: 1.20m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

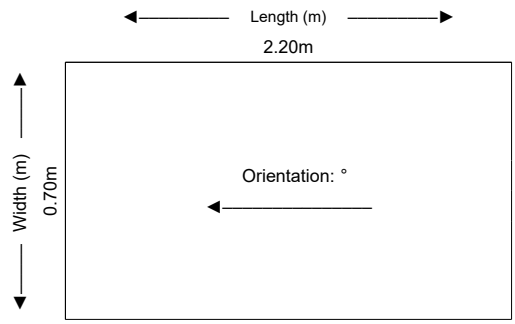
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP02
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction		Stability: stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30) 0.30		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			(0.35) 0.65		Light orangish grey very sandy CLAY. Occasional rootlets. Pockets of clayey sand.		
0.60	B					End of Trial Pit at 0.65m		
0.60	D							

1 2 3

Dimensions:

Final Depth: 0.65m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

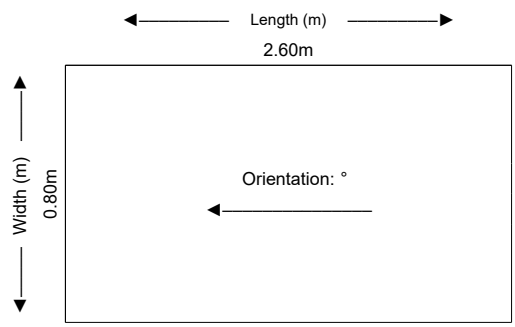
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP03
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction		Stability: stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			0.30		Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				(0.90)				
1.25	B			1.20		Laminated dark grey FLAGSTONE. Weathered.		
1.25	D			1.30		End of Trial Pit at 1.30m		

1 2 3

Dimensions:

Final Depth: 1.30m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP04
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction		Stability: stable		Sheet 1 of 1

Samples & In Situ Testing			Strata Details					
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description	Water	Backfill
0.20	ES			0.25		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			(0.65)		Light orangish brown very sandy CLAY. Occasional rootlets.		
1.00	B			0.90		Laminated dark grey FLAGSTONE. Weathered.		
1.00	D			(0.30)				
				1.20		End of Trial Pit at 1.20m		

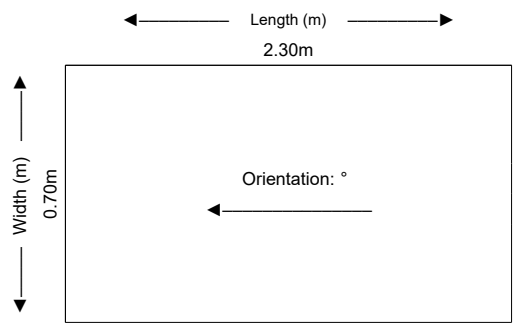
1

2

3

Dimensions:

Final Depth: 1.20m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

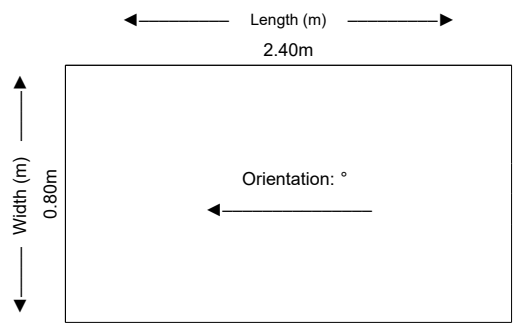
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP05
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25

Weather: Sunny with showers | Hole Termination: Terminated on rock or boulder obstruction | Stability: stable

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				0.30				
				(0.40)		Soft light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				0.70				
1.00	ES					Firm dark brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.	1	
				(1.10)				
1.50	B							
1.50	D							
				1.80		End of Trial Pit at 1.80m		
							2	
							3	

Dimensions:

Final Depth: 1.80m



Inclination: 90°

General Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.70			0		Moderate

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP06
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.40)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				0.40				
0.50	ES			(0.30)		Dark brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				0.70		Laminated dark grey FLAGSTONE. Weathered.		
1.00	B			(0.50)				
1.00	D			1.20		End of Trial Pit at 1.20m		

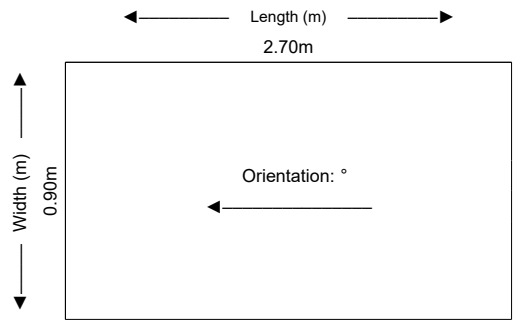
1

2

3

Dimensions:

Final Depth: 1.20m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

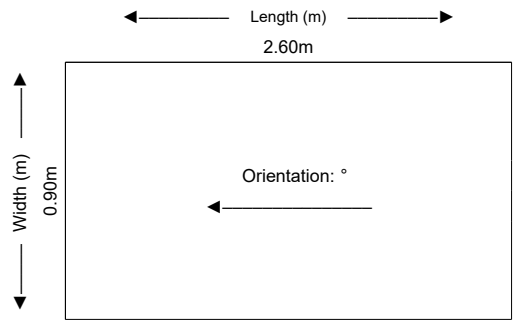
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP07
	Contract Number: 1003-015	Date Started: 29/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.10	ES			0.15		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			(0.95)		Light orangish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone. Pockets of clayey sand.		
1.00 1.00	B D			1.10		Laminated dark grey FLAGSTONE. Weathered.		
				1.20		End of Trial Pit at 1.20m		

Dimensions:

Final Depth: 1.20m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

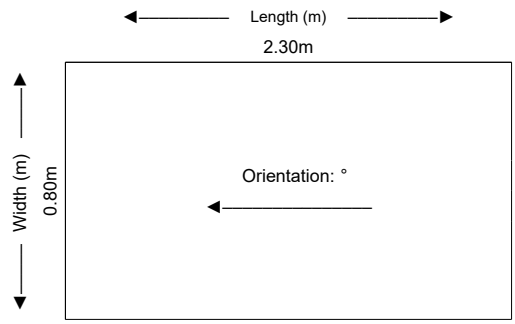
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP08
	Contract Number: 1003-015	Date Started: 29/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunn	Hole Termination: Terminated on rock or boulder obstruction.		Stability: stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
				(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.20	ES			0.30				
				(0.50)		Light orangish brown slightly gravelly sandy CLAY. Occasional rootlets. Pockets of clayey sand.		
				0.80				
1.00	B					Laminated dark grey FLAGSTONE. Weathered.		
1.00	D			(0.60)				
1.00	ES							
				1.40		End of Trial Pit at 1.40m		

1
2
3

Dimensions:

Final Depth: 1.40m



Inclination: 90°

General Remarks:

Field drain in western sidewall at 0.80m.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.30			0		

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP09
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction		Stability: stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown very organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			0.30		Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
0.60	B			(1.10)				
0.60	D			1.40		Laminated dark grey FLAGSTONE. Weathered.		
				(0.40)				
				1.80		End of Trial Pit at 1.80m		

1 2 3

Dimensions:

Final Depth: 1.80m

Length (m) 2.30m

Width (m) 0.90m

Orientation: °

Inclination: 90°

General Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.80			0		Moderate

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP10
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction		Stability: stable		Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown very organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.60	B			0.30		Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
0.60	D							
1.00	ES			(1.30)				
				1.60		Dark brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				1.80		End of Trial Pit at 1.80m		

1 2 3

Dimensions:

Final Depth: 1.80m

Length (m) 2.30m

Width (m) 0.80m

Orientation: °

Inclination: 90°

General Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.70			0		Moderate

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP11
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.60	B			0.30		Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone. Pockets of clayey gravel.		
0.60	D			(0.90)				
1.00	ES			1.20		End of Trial Pit at 1.20m		

1
2
3

Dimensions:

Final Depth: 1.20m

Length (m) 2.60m

Width (m) 0.90m

Orientation: °

Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

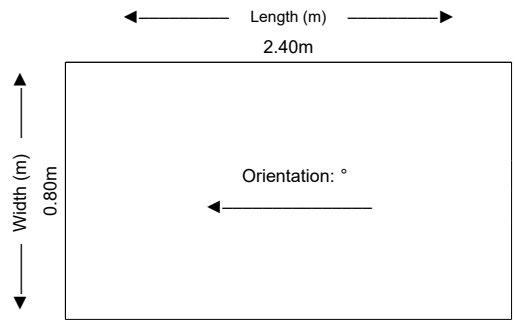
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP12
	Contract Number: 1003-015	Date Started: 29/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunn	Hole Termination: Terminated on rock or boulder obstruction.		Stability: stable		Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			0.25		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			(0.45)		Light orangish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone. Pockets of clayey sand.		
0.60	B			0.70		Laminated dark grey FLAGSTONE. Weathered.		
0.60	D			0.90		End of Trial Pit at 0.90m		

1 2 3

Dimensions:

Final Depth: 0.90m



Inclination: 90°

General Remarks:

No groundwater encountered. Gravel trench through centre of pit at 0.40m, likely drainage channel. Water ingress from channel.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP13
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25

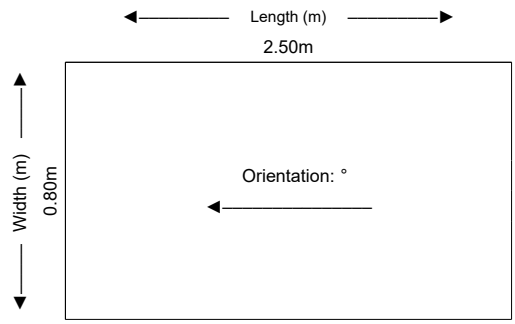
Weather: Sunny with showers | Hole Termination: Terminated on rock or boulder obstruction | Stability: stable

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			0.30		Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				(0.90)				
				1.20		Laminated dark grey FLAGSTONE. Weathered.		
1.50	B			(0.40)				
1.50	D			1.60		End of Trial Pit at 1.60m		

1 2 3

Dimensions:

Final Depth: 1.60m



Inclination: 90°

General Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.50			0		Moderate

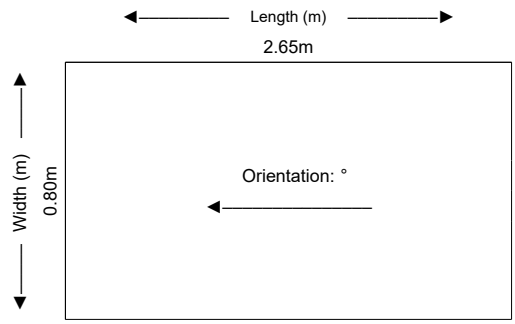
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP14
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers		Hole Termination: Terminated on rock or boulder obstruction		Stability: stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.60	B			0.30		Light orangish brown slightly gravelly sandy CLAY. Occasional rootlets. Pockets of clayey sand.		
0.60	D			(0.60)				
1.00	ES			0.90		Laminated dark grey FLAGSTONE. Weathered.		
				1.10		End of Trial Pit at 1.10m		

1 2 3

Dimensions:

Final Depth: 1.10m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

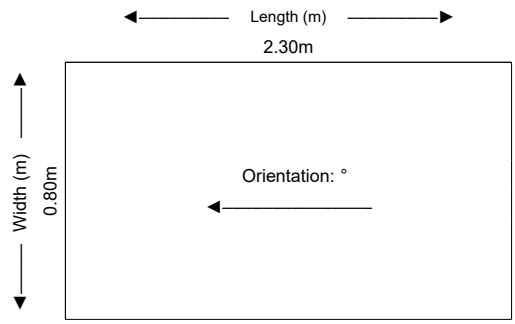
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP15
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			0.30		Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
0.60	B			(0.70)				
0.60	D			1.00				
				1.05		Laminated dark grey FLAGSTONE. Weathered. End of Trial Pit at 1.05m		

1
2
3

Dimensions:

Final Depth: 1.05m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

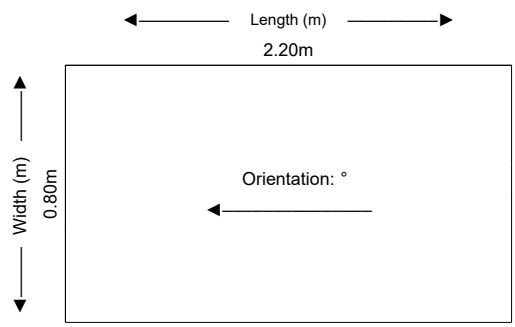
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP16
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers		Hole Termination: Terminated on rock or boulder obstruction		Stability: stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic sandy CLAY. Peaty. Frequent organic matter.		
				0.30				
0.60	B			(0.50)		Light orangish brown slightly gravelly sandy CLAY. Occasional rootlets. Pockets of clayey sand.		
0.60	D							
				0.80		Laminated dark grey FLAGSTONE. Weathered.		
1.00	ES			1.05		End of Trial Pit at 1.05m		

Dimensions:

Final Depth: 1.05m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

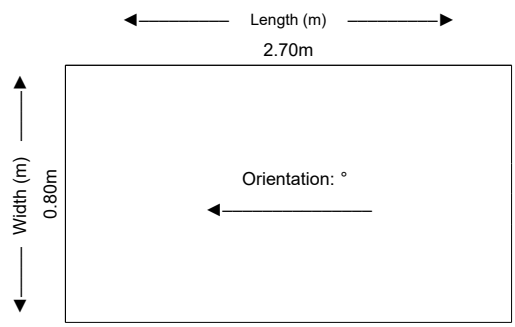
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP17
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20 0.25 0.25	ES B D			(0.30) 0.30		Dark brown very organic slightly sandy CLAY. Peaty. Frequent organic matter.		
1.00	ES			(0.90) 1.20		Light orangish brown very sandy CLAY. Occasional rootlets.		
				(0.40) 1.60		Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone. End of Trial Pit at 1.60m		

1
2
3

Dimensions:

Final Depth: 1.60m



Inclination: 90°

General Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.60			0		Seepage

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP18
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25

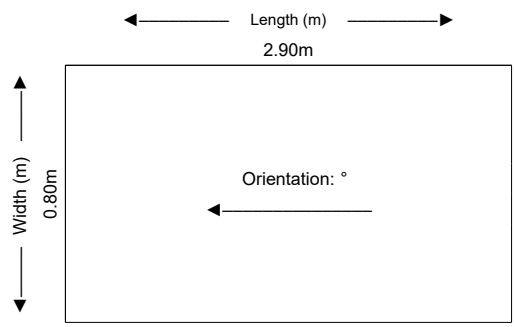
Weather: Sunny with showers | Hole Termination: Terminated on rock or boulder obstruction | Stability: stable

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.35)		Dark brown very organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				0.35		Light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
1.00	B			(0.95)				
1.00	D							
1.00	ES							
				1.30		End of Trial Pit at 1.30m		

1 2 3

Dimensions:

Final Depth: 1.30m



Inclination: 90°

General Remarks:

No groundwater encountered. Field drain at 0.60m.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP19
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25

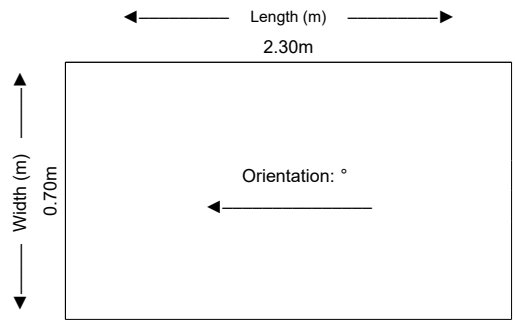
Weather: Sunny with showers | Hole Termination: Terminated on rock or boulder obstruction | Stability: stable

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				0.30				
0.50	ES			(0.40)		Light orangish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone. Pockets of clayey sand.		
0.60	B							
0.60	D			0.70				
				(0.50)		Dark brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				1.20		End of Trial Pit at 1.20m		

1 2 3

Dimensions:

Final Depth: 1.20m



Inclination: 90°

General Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.20			0		Moderate

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP20
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25

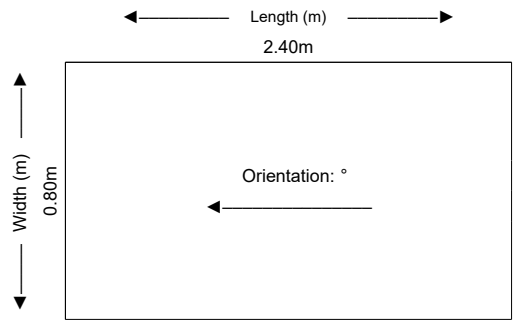
Weather: Sunny with showers | Hole Termination: Terminated on rock or boulder obstruction | Stability: stable

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				0.30				
0.50	ES					Light orangish brown slightly gravelly sandy CLAY. Occasional rootlets. Pockets of clayey sand.		
				(1.10)				
1.00	B							
1.00	D							
				1.40		Laminated dark grey FLAGSTONE. Weathered.		
				1.60		End of Trial Pit at 1.60m		

1 2 3

Dimensions:

Final Depth: 1.60m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

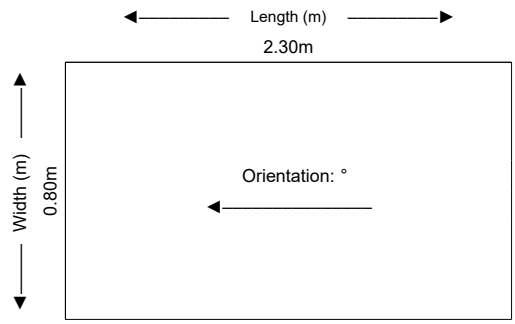
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP21
	Contract Number: 1003-015	Date Started: 29/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunn	Hole Termination: Terminated on rock or boulder obstruction		Stability: stable		Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.40)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.30	B							
0.30	D			0.40				
0.50	ES			(0.80)		Light orangish brown slightly gravelly sandy CLAY. Occasional rootlets. Pockets of clayey sand.		
				1.20		Laminated dark grey FLAGSTONE. Weathered.		
				(0.30)				
				1.50		End of Trial Pit at 1.50m		

1 2 3

Dimensions:

Final Depth: 1.50m



Inclination: 90°

General Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.40			0		Moderate

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP22
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction		Stability: stable		Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				0.30				
0.50	ES			(0.50)		Light orangish brown slightly gravelly sandy CLAY. Occasional rootlets. Pockets of clayey sand.		
				0.80				
1.20	B			(0.70)		Dark brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
1.20	D							
				1.50		Laminated dark grey FLAGSTONE. Weathered.		
				1.60		End of Trial Pit at 1.60m		

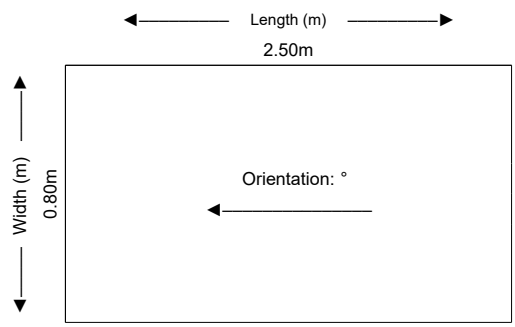
1

2

3

Dimensions:

Final Depth: 1.60m



Inclination: 90°

General Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.50			0		Moderate

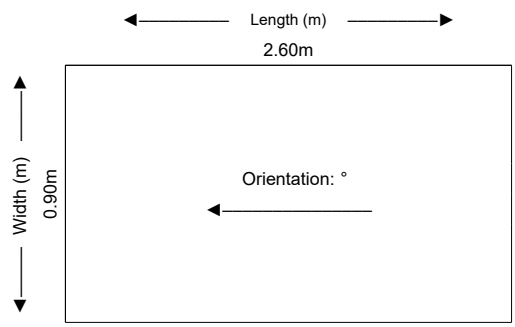
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP23
	Contract Number: 1003-015	Date Started: 29/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30) 0.30		Dark brown very organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			(0.80) 1.10		Light orangish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone. Pockets of clayey sand.		
1.20 1.20	B D			1.30		Laminated dark grey FLAGSTONE. Weathered. End of Trial Pit at 1.30m		

1
2
3

Dimensions:

Final Depth: 1.30m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

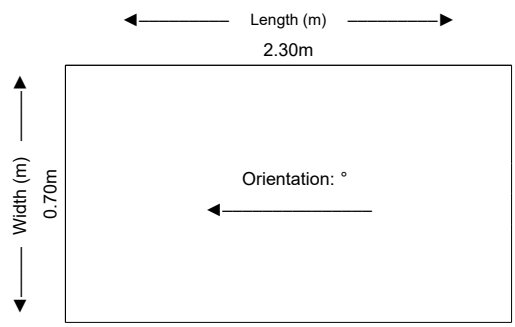
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP24
	Contract Number: 1003-015	Date Started: 29/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunn	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			0.25		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			(0.35)		Light orangish brown slightly gravelly sandy CLAY. Occasional rootlets. Pockets of clayey sand.		
0.70	B			0.60		Laminated dark grey FLAGSTONE. Weathered.		
0.70	D			0.80		End of Trial Pit at 0.80m		

Dimensions:

Final Depth: 0.80m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

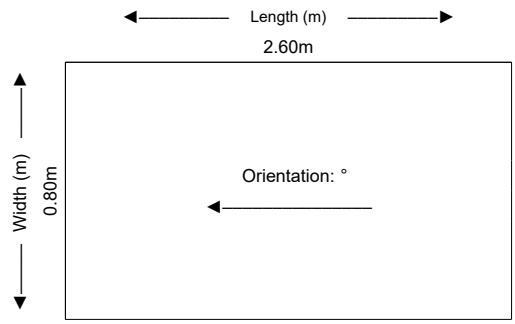
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP25
	Contract Number: 1003-015	Date Started: 29/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunn	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30) 0.30		Dark brown very organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				(0.75)		Light orangish brown sandy CLAY. Occasional rootlets.		
0.90	B							
0.90	D							
1.00	ES			1.05				
				1.20		Dark brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				1.30		Laminated dark grey FLAGSTONE. Weathered. End of Trial Pit at 1.30m		

1 2 3

Dimensions:

Final Depth: 1.30m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

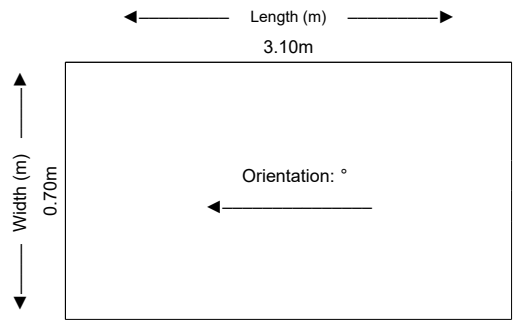
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP26
	Contract Number: 1003-015	Date Started: 27/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used:	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunny with showers	Hole Termination: Terminated on rock or boulder obstruction		Stability: stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown very organic slightly sandy CLAY. Peaty. Frequent organic matter.		
				0.30		Light orangish brown very sandy CLAY. Occasional rootlets.		
0.50	ES			(0.50)				
0.60	B							
0.60	D			0.80				
						Firm light brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				(0.70)				
				1.70		End of Trial Pit at 1.70m		

1 2 3

Dimensions:

Final Depth: 1.70m



Inclination: 90°

General Remarks:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.70			0		Moderate

ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP27
	Contract Number: 1003-015	Date Started: 28/02/2024	Logged By: SO	Checked By:	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25

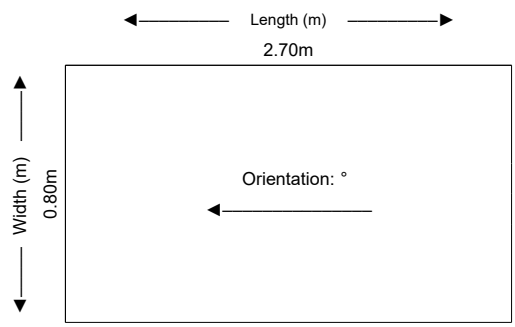
Weather: Sunny with showers | Hole Termination: Terminated on rock or boulder obstruction | Stability: stable

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			0.25		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			(0.55)		Light orangish brown slightly gravelly sandy CLAY. Occasional rootlets. Pockets of clayey sand.		
1.00	B			0.80		Laminated dark grey FLAGSTONE. Weathered.		
1.00	D			(0.30)				
				1.10		End of Trial Pit at 1.10m		

1 2 3

Dimensions:

Final Depth: 1.10m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

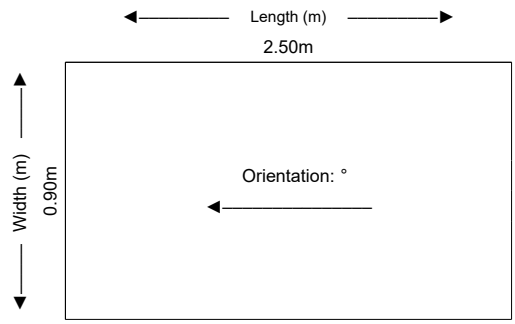
ers	Contract Name: Rigifa, Thurso		Client: Curtins		Trial Pit ID: TP28
	Contract Number: 1003-015	Date Started: 29/02/2024	Logged By: SO	Checked By:	Status: DRAFT
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5T Tracked Excavator	Date Produced: 04/03/2024
					Scale: 1:25
Weather: Sunn	Hole Termination: Terminated on rock or boulder obstruction			Stability: stable	Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.30)		Dark brown organic slightly sandy CLAY. Peaty. Frequent organic matter.		
0.50	ES			0.30		Light orangish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone. Pockets of clayey sand.		
0.60	B			(0.50)				
0.60	D			0.80		Dark brownish grey slightly gravelly sandy CLAY, with low cobble content. Gravel is angular to subangular fine to coarse of flagstone. Cobbles are subangular to subrounded of flagstone.		
				(0.60)				
				1.40		Laminated dark grey FLAGSTONE. Weathered.		
				(0.30)				
				1.70		End of Trial Pit at 1.70m		

1 2 3

Dimensions:

Final Depth: 1.70m



Inclination: 90°

General Remarks:

No groundwater encountered.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Appendix C – Laboratory Testing Results

Certificate of Analysis

Certificate Number	24-04820	*Issued:*	13-Mar-24
Client	Curtins Consulting 29 St Vincent Place Glasgow G1 2DT		

Our Reference	24-04820
Client Reference ~	(not supplied)
Order No ~	(not supplied)
Contract Title ~	Rigfa
Description	22 Soil samples.
Date Received	07-Mar-24
Date Started	07-Mar-24
Date Completed	13-Mar-24
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By [redacted]

General Manager

2139

Summary of Chemical Analysis
Soil Samples

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

	Lab No	2308613	2308614	2308615	2308616	2308617	2308618
	Sample ID ~	TP01	TP01	TP02	TP03	TP04	TP05
	Depth ~	0.20	0.50	0.50	0.50	0.50	1.00
	Other ID ~						
	Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampling Date ~	27/02/2024	27/02/2024	27/02/2024	27/02/2024	28/02/2024	27/02/2024
	Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	16		8.5	7.4	5.5	5.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.6		< 0.2	< 0.2	< 0.2	0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.1
Chromium	DETSC 2301#	0.15	mg/kg	17		21	25	22	23
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	9.4		13	14	10	20
Lead	DETSC 2301#	0.3	mg/kg	14		9.6	10	9.1	11
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l		< 10				
Mercury	DETSC 2325#	0.05	mg/kg	0.06		< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	8.9		20	13	18	23
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	35		38	29	33	50
Inorganics									
pH	DETSC 2008#		pH	5.9	6.3	6.3	6.2	5.4	5.8
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.6		0.1	< 0.1	0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	5.6		0.5	0.2	1.0	0.2
Ammonia Aqueous Extract as N	DETSC 2119*	10	mg/l		< 10				
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l		7.1				
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l		< 1.0				
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	25	18	< 10	12	< 10	35
Sulphur as S, Total	DETSC 2320	0.01	%		0.01				
Sulphate as SO4, Total	DETSC 2321#	0.01	%		0.03				
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5		< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2		< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5		< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4		< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10		< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9		< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6		< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4		< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10		< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10		< 10	< 10	< 10	< 10
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1

Results are based on sample details provided by client and DETS cannot be held responsible for the validity of the results. * -not accredited.: # -MCERTS (accreditation only applies if report carries the MCERTS logo).

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Summary of Chemical Analysis
Soil Samples

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

				Lab No	2308613	2308614	2308615	2308616	2308617	2308618
				Sample ID ~	TP01	TP01	TP02	TP03	TP04	TP05
				Depth ~	0.20	0.50	0.50	0.50	0.50	1.00
				Other ID ~						
				Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date ~	27/02/2024	27/02/2024	27/02/2024	27/02/2024	28/02/2024	27/02/2024
				Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.2		< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.7		< 1.6	< 1.6	< 1.6	< 1.6
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.2		< 0.3	< 0.3	< 0.3	< 0.3

Key: ~ Sample details provided by client and can affect the validity of the results: * -not accredited.: # -MCERTS (accreditation only applies if report carries the MCERTS logo).

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Summary of Chemical Analysis
Soil Samples

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

	Lab No	2308619	2308620	2308621	2308622	2308623	2308624
	Sample ID ~	TP06	TP07	TP08	TP09	TP10	TP12
	Depth ~	0.50	0.10	1.00	0.50	1.00	0.50
	Other ID ~						
	Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampling Date ~	27/02/2024	27/02/2024	29/02/2024	27/02/2024	27/02/2024	29/02/2024
	Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg		1.6	17	6.0		2.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		0.4	< 0.2	< 0.2		< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg		< 0.1	0.1	0.2		< 0.1
Chromium	DETSC 2301#	0.15	mg/kg		6.5	58	16		25
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0	< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg		4.1	36	15		8.9
Lead	DETSC 2301#	0.3	mg/kg		6.2	13	13		10
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10				< 10	
Mercury	DETSC 2325#	0.05	mg/kg		< 0.05	< 0.05	0.08		< 0.05
Nickel	DETSC 2301#	1	mg/kg		4.2	63	15		27
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5	< 0.5	< 0.5		< 0.5
Zinc	DETSC 2301#	1	mg/kg		18	83	44		120
Inorganics									
pH	DETSC 2008#		pH	6.8	5.6	7.3	5.2	5.7	6.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg		0.6	< 0.1	0.1		0.1
Organic matter	DETSC 2002#	0.1	%		8.7	0.8	1.0		0.6
Ammonia Aqueous Extract as N	DETSC 2119*	10	mg/l	< 10				< 10	
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	4.7				6.0	
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	1.9				< 1.0	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	11	23	37	23	10	16
Sulphur as S, Total	DETSC 2320	0.01	%	0.01				0.01	
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.02				0.02	
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01		< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01		< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01		< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5		< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		< 1.2	< 1.2	< 1.2		< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5		< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		< 3.4	< 3.4	< 3.4		< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10	< 10		< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01		< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01		< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01		< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		< 0.9	< 0.9	< 0.9		< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		< 0.5	< 0.5	< 0.5		< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		< 0.6	< 0.6	< 0.6		< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		< 1.4	< 1.4	< 1.4		< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10	< 10		< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10	< 10		< 10
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1

Results relate to sample details provided by client and DETS cannot be held responsible for the validity of these details. Key: * -not accredited, # -MCERTS (accreditation only applies if report carries the MCERTS logo).

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Summary of Chemical Analysis
Soil Samples

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

	Lab No	2308619	2308620	2308621	2308622	2308623	2308624
	Sample ID ~	TP06	TP07	TP08	TP09	TP10	TP12
	Depth ~	0.50	0.10	1.00	0.50	1.00	0.50
	Other ID ~						
	Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampling Date ~	27/02/2024	27/02/2024	29/02/2024	27/02/2024	27/02/2024	29/02/2024
	Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Acenaphthylene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Fluorene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Anthracene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Pyrene	DETSC 3301	0.1	mg/kg		0.3	< 0.1	0.1		< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Chrysene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg		< 1.7	< 1.6	< 1.7		< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		2.3	< 0.3	< 0.3		< 0.3

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Summary of Chemical Analysis
Soil Samples

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

	Lab No	2308625	2308626	2308627	2308628	2308629	2308630
	Sample ID ~	TP14	TP15	TP19	TP20	TP21	TP23
	Depth ~	0.20	0.50	0.50	0.50	0.50	0.20
	Other ID ~						
	Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampling Date ~	28/02/2024	28/02/2024	27/02/2024	28/02/2024	29/02/2024	29/02/2024
	Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	1.3	3.9	20		4.1	12
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.4	0.2	< 0.2		< 0.2	0.4
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	5.8	19	18		22	39
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	3.6	16	5.7		16	11
Lead	DETSC 2301#	0.3	mg/kg	4.8	8.4	8.6		9.9	12
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l				< 10		
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	2.5	12	12		14	22
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	14	32	23		39	60
Inorganics									
pH	DETSC 2008#		pH	5.8	5.3	6.9	5.4	5.3	6.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.5	< 0.1	3.7		0.1	0.5
Organic matter	DETSC 2002#	0.1	%	8.6	0.5	0.4		0.5	4.5
Ammonia Aqueous Extract as N	DETSC 2119*	10	mg/l				< 10		
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l				5.7		
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l				4.0		
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	17	< 10	12	11	< 10	20
Sulphur as S, Total	DETSC 2320	0.01	%				< 0.01		
Sulphate as SO4, Total	DETSC 2321#	0.01	%				0.02		
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5		< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2		< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5		< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4		< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10		< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9		< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6		< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4		< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10		< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10		< 10	< 10
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1

Test/Sample details provided by client and DETS cannot affect the validity of the results: * -not accredited. # MCERTS (accreditation only applies if report carries the MCERTS logo).

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Summary of Chemical Analysis
Soil Samples

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

				Lab No	2308625	2308626	2308627	2308628	2308629	2308630
				Sample ID ~	TP14	TP15	TP19	TP20	TP21	TP23
				Depth ~	0.20	0.50	0.50	0.50	0.50	0.20
				Other ID ~						
				Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date ~	28/02/2024	28/02/2024	27/02/2024	28/02/2024	29/02/2024	29/02/2024
				Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	0.2		< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1		< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.7	< 1.6	< 1.7		< 1.6	< 1.6
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.1	< 0.3	0.5		0.4	0.7

Key: ~ Sample details provided by client and can affect the validity of the results: * -not accredited.: # -MCERTS (accreditation only applies if report carries the MCERTS logo).

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Summary of Chemical Analysis
Soil Samples

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

	Lab No	2308631	2308632	2308633	2308634
	Sample ID ~	TP23	TP24	TP26	TP27
	Depth ~	0.50	0.50	0.50	0.50
	Other ID ~				
	Sample Type ~	SOIL	SOIL	SOIL	SOIL
	Sampling Date ~	29/02/2024	29/02/2024	27/02/2024	28/02/2024
	Sampling Time ~	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg		2.8		4.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		< 0.2		< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg		< 0.1		< 0.1
Chromium	DETSC 2301#	0.15	mg/kg		9.4		21
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg		2.3		16
Lead	DETSC 2301#	0.3	mg/kg		7.3		10
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	< 10		< 10	
Mercury	DETSC 2325#	0.05	mg/kg		< 0.05		< 0.05
Nickel	DETSC 2301#	1	mg/kg		2.7		11
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5		< 0.5
Zinc	DETSC 2301#	1	mg/kg		15		25
Inorganics							
pH	DETSC 2008#		pH	6.0	5.7	4.8	5.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg		0.2		< 0.1
Organic matter	DETSC 2002#	0.1	%		1.3		0.5
Ammonia Aqueous Extract as N	DETSC 2119*	10	mg/l	< 10		< 10	
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	15		15	
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	3.5		< 1.0	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	16	11	38	< 10
Sulphur as S, Total	DETSC 2320	0.01	%	0.04		0.01	
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.02		0.09	
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		< 1.5		< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		< 1.2		< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		< 1.5		< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		< 3.4		< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		< 10		< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		< 0.9		< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		< 0.5		< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		< 0.6		< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		< 1.4		< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg		< 10		< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg		< 10		< 10
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1

Test Sample details provided by client and DETS cannot the validity of the results: * -not accredited. # MCERTS (accreditation only applies if report carries the MCERTS logo).

: n/s -not

Summary of Chemical Analysis
Soil Samples

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

	Lab No	2308631	2308632	2308633	2308634
	Sample ID ~	TP23	TP24	TP26	TP27
	Depth ~	0.50	0.50	0.50	0.50
	Other ID ~				
	Sample Type ~	SOIL	SOIL	SOIL	SOIL
	Sampling Date ~	29/02/2024	29/02/2024	27/02/2024	28/02/2024
	Sampling Time ~	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Acenaphthylene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Fluorene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Anthracene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Pyrene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Chrysene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		< 0.1		< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg		< 1.6		< 1.6
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		< 0.3		< 0.3

Key: ~ Sample details provided by client and can affect the validity of the results: * -not accredited.: # -MCERTS (accreditation only applies if report carries the MCERTS logo).

: n/s -not

Summary of Asbestos Analysis
Soil Samples

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2308613	TP01 0.20	SOIL	NAD	none	Ben Barsby
2308615	TP02 0.50	SOIL	NAD	none	Ben Barsby
2308616	TP03 0.50	SOIL	NAD	none	Ben Barsby
2308617	TP04 0.50	SOIL	NAD	none	Ben Barsby
2308618	TP05 1.00	SOIL	NAD	none	Ben Barsby
2308620	TP07 0.10	SOIL	NAD	none	Ben Barsby
2308621	TP08 1.00	SOIL	NAD	none	Ben Barsby
2308622	TP09 0.50	SOIL	NAD	none	Ben Barsby
2308624	TP12 0.50	SOIL	NAD	none	Ben Barsby
2308625	TP14 0.20	SOIL	NAD	none	Ben Barsby
2308626	TP15 0.50	SOIL	NAD	none	Ben Barsby
2308627	TP19 0.50	SOIL	NAD	none	Ben Barsby
2308629	TP21 0.50	SOIL	NAD	none	Ben Barsby
2308630	TP23 0.20	SOIL	NAD	none	Ben Barsby
2308632	TP24 0.50	SOIL	NAD	none	Ben Barsby
2308634	TP27 0.50	SOIL	NAD	none	Ben Barsby

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Summary of Chemical Analysis
Threshold Breaches

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

Job	Lab No	Sample ID	Depth	Other ID	Test	Result	Threshold Upper	Threshold Lower	Threshold	SOM Result	SOM1/ SOM6
24-04820	2308620	TP07	0.10		pH	5.6	8	6	CURTINS1 Playing Fields Attached to Schools end use	8.6672	SOM6
24-04820	2308625	TP14	0.20		pH	5.79	8	6	CURTINS1 Playing Fields Attached to Schools end use	8.6464	SOM6
24-04820	2308620	TP07	0.10		pH	5.6	8	6	CURTINS2 Playing Fields end use	8.6672	SOM6
24-04820	2308625	TP14	0.20		pH	5.79	8	6	CURTINS2 Playing Fields end use	8.6464	SOM6
24-04820	2308620	TP07	0.10		Chromium	6.54	3.06	-9999	CURTINS3 Allotment end use	8.6672	SOM6
24-04820	2308620	TP07	0.10		pH	5.6	8	6	CURTINS3 Allotment end use	8.6672	SOM6
24-04820	2308625	TP14	0.20		Chromium	5.78	3.06	-9999	CURTINS3 Allotment end use	8.6464	SOM6
24-04820	2308625	TP14	0.20		pH	5.79	8	6	CURTINS3 Allotment end use	8.6464	SOM6
24-04820	2308613	TP01	0.20		pH	5.85	8	6	CURTINS4 Residential without Home Grown Produce end	5.6492	SOM1
24-04820	2308617	TP04	0.50		pH	5.44	8	6	CURTINS4 Residential without Home Grown Produce end	1.047	SOM1
24-04820	2308618	TP05	1.00		pH	5.79	8	6	CURTINS4 Residential without Home Grown Produce end	0.1577	SOM1
24-04820	2308620	TP07	0.10		pH	5.6	8	6	CURTINS4 Residential without Home Grown Produce end	8.6672	SOM6
24-04820	2308622	TP09	0.50		pH	5.17	8	6	CURTINS4 Residential without Home Grown Produce end	1.0346	SOM1
24-04820	2308625	TP14	0.20		pH	5.79	8	6	CURTINS4 Residential without Home Grown Produce end	8.6464	SOM6
24-04820	2308626	TP15	0.50		pH	5.27	8	6	CURTINS4 Residential without Home Grown Produce end	0.4875	SOM1
24-04820	2308629	TP21	0.50		pH	5.26	8	6	CURTINS4 Residential without Home Grown Produce end	0.5262	SOM1
24-04820	2308632	TP24	0.50		pH	5.69	8	6	CURTINS4 Residential without Home Grown Produce end	1.2968	SOM1
24-04820	2308634	TP27	0.50		pH	5	8	6	CURTINS4 Residential without Home Grown Produce end	0.5012	SOM1
24-04820	2308613	TP01	0.20		pH	5.85	8	6	CURTINS5 Open Space end use	5.6492	SOM1
24-04820	2308617	TP04	0.50		pH	5.44	8	6	CURTINS5 Open Space end use	1.047	SOM1
24-04820	2308618	TP05	1.00		pH	5.79	8	6	CURTINS5 Open Space end use	0.1577	SOM1
24-04820	2308620	TP07	0.10		pH	5.6	8	6	CURTINS5 Open Space end use	8.6672	SOM6
24-04820	2308622	TP09	0.50		pH	5.17	8	6	CURTINS5 Open Space end use	1.0346	SOM1
24-04820	2308625	TP14	0.20		pH	5.79	8	6	CURTINS5 Open Space end use	8.6464	SOM6
24-04820	2308626	TP15	0.50		pH	5.27	8	6	CURTINS5 Open Space end use	0.4875	SOM1
24-04820	2308629	TP21	0.50		pH	5.26	8	6	CURTINS5 Open Space end use	0.5262	SOM1
24-04820	2308632	TP24	0.50		pH	5.69	8	6	CURTINS5 Open Space end use	1.2968	SOM1

Key: ~ Sample details provided by client and can affect the validity of the results

Summary of Chemical Analysis
Threshold Breaches

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

Job	Lab No	Sample ID	Depth	Other ID	Test	Result	Threshold Upper	Threshold Lower	Threshold	SOM Result	SOM1/ SOM6
24-04820	2308634	TP27	0.50		pH	5	8	6	CURTINS5 Open Space end use	0.5012	SOM1
24-04820	2308613	TP01	0.20		pH	5.85	8	6	CURTINS6 Parks end use	5.6492	SOM1
24-04820	2308617	TP04	0.50		pH	5.44	8	6	CURTINS6 Parks end use	1.047	SOM1
24-04820	2308618	TP05	1.00		pH	5.79	8	6	CURTINS6 Parks end use	0.1577	SOM1
24-04820	2308620	TP07	0.10		pH	5.6	8	6	CURTINS6 Parks end use	8.6672	SOM6
24-04820	2308622	TP09	0.50		pH	5.17	8	6	CURTINS6 Parks end use	1.0346	SOM1
24-04820	2308625	TP14	0.20		pH	5.79	8	6	CURTINS6 Parks end use	8.6464	SOM6
24-04820	2308626	TP15	0.50		pH	5.27	8	6	CURTINS6 Parks end use	0.4875	SOM1
24-04820	2308629	TP21	0.50		pH	5.26	8	6	CURTINS6 Parks end use	0.5262	SOM1
24-04820	2308632	TP24	0.50		pH	5.69	8	6	CURTINS6 Parks end use	1.2968	SOM1
24-04820	2308634	TP27	0.50		pH	5	8	6	CURTINS6 Parks end use	0.5012	SOM1
24-04820	2308613	TP01	0.20		pH	5.85	8	6	CURTINS7 Commercial end use	5.6492	SOM1
24-04820	2308617	TP04	0.50		pH	5.44	8	6	CURTINS7 Commercial end use	1.047	SOM1
24-04820	2308618	TP05	1.00		pH	5.79	8	6	CURTINS7 Commercial end use	0.1577	SOM1
24-04820	2308620	TP07	0.10		pH	5.6	8	6	CURTINS7 Commercial end use	8.6672	SOM6
24-04820	2308622	TP09	0.50		pH	5.17	8	6	CURTINS7 Commercial end use	1.0346	SOM1
24-04820	2308625	TP14	0.20		pH	5.79	8	6	CURTINS7 Commercial end use	8.6464	SOM6
24-04820	2308626	TP15	0.50		pH	5.27	8	6	CURTINS7 Commercial end use	0.4875	SOM1
24-04820	2308629	TP21	0.50		pH	5.26	8	6	CURTINS7 Commercial end use	0.5262	SOM1
24-04820	2308632	TP24	0.50		pH	5.69	8	6	CURTINS7 Commercial end use	1.2968	SOM1
24-04820	2308634	TP27	0.50		pH	5	8	6	CURTINS7 Commercial end use	0.5012	SOM1
24-04820	2308613	TP01	0.20		pH	5.85	8	6	CURTINS8 Residential with consumption of Produce end u	5.6492	SOM1
24-04820	2308617	TP04	0.50		pH	5.44	8	6	CURTINS8 Residential with consumption of Produce end u	1.047	SOM1
24-04820	2308618	TP05	1.00		pH	5.79	8	6	CURTINS8 Residential with consumption of Produce end u	0.1577	SOM1
24-04820	2308620	TP07	0.10		pH	5.6	8	6	CURTINS8 Residential with consumption of Produce end u	8.6672	SOM6
24-04820	2308622	TP09	0.50		pH	5.17	8	6	CURTINS8 Residential with consumption of Produce end u	1.0346	SOM1
24-04820	2308625	TP14	0.20		pH	5.79	8	6	CURTINS8 Residential with consumption of Produce end u	8.6464	SOM6

Key: ~ Sample details provided by client and can affect the validity of the results

Summary of Chemical Analysis
Threshold Breaches

Our Ref 24-04820
Client Ref ~
Contract Title ~ Rigfa

Job	Lab No	Sample ID	Depth	Other ID	Test	Result	Threshold Upper	Threshold Lower	Threshold	SOM Result	SOM1/ SOM6
24-04820	2308626	TP15	0.50		pH	5.27	8	6	CURTINS8 Residential with consumption of Produce end u	0.4875	SOM1
24-04820	2308629	TP21	0.50		pH	5.26	8	6	CURTINS8 Residential with consumption of Produce end u	0.5262	SOM1
24-04820	2308632	TP24	0.50		pH	5.69	8	6	CURTINS8 Residential with consumption of Produce end u	1.2968	SOM1
24-04820	2308634	TP27	0.50		pH	5	8	6	CURTINS8 Residential with consumption of Produce end u	0.5012	SOM1

Key: ~ Sample details provided by client and can affect the validity of the results

Information in Support of the Analytical Results

Our Ref 24-04820
Client Ref ~
Contract ~ Rigfa

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2308613	TP01 0.20 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308614	TP01 0.50 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2308615	TP02 0.50 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308616	TP03 0.50 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308617	TP04 0.50 SOIL	28/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308618	TP05 1.00 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308619	TP06 0.50 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2308620	TP07 0.10 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308621	TP08 1.00 SOIL	29/02/24	GJ 250ml, GJ 60ml, PT 1L		
2308622	TP09 0.50 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308623	TP10 1.00 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2308624	TP12 0.50 SOIL	29/02/24	GJ 250ml, GJ 60ml, PT 1L		
2308625	TP14 0.20 SOIL	28/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308626	TP15 0.50 SOIL	28/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308627	TP19 0.50 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
2308628	TP20 0.50 SOIL	28/02/24	GJ 250ml, GJ 60ml, PT 1L	Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2308629	TP21 0.50 SOIL	29/02/24	GJ 250ml, GJ 60ml, PT 1L		
2308630	TP23 0.20 SOIL	29/02/24	GJ 250ml, GJ 60ml, PT 1L		
2308631	TP23 0.50 SOIL	29/02/24	GJ 250ml, GJ 60ml, PT 1L	Ammonia Aqueous Extract (3 days)	
2308632	TP24 0.50 SOIL	29/02/24	GJ 250ml, GJ 60ml, PT 1L		
2308633	TP26 0.50 SOIL	27/02/24	GJ 250ml, GJ 60ml, PT 1L	Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2308634	TP27 0.50 SOIL	28/02/24	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	24-06681	*Issued:*	08-Apr-24

Client Curtins Consulting
29 St Vincent Place
Glasgow
G1 2DT

Our Reference	24-06681
Client Reference ~	(not supplied)
Order No ~	(not supplied)
Contract Title ~	RIGIFA
Description	2 Soil samples.
Date Received	02-Apr-24
Date Started	02-Apr-24
Date Completed	08-Apr-24
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By [redacted]
General Manager

Summary of Chemical Analysis
Soil Samples

Our Ref 24-06681
Client Ref ~
Contract Title ~ RIGIFA

			Lab No	2319326	2319327
			Sample ID ~	HP01	HP01
			Depth ~	0.20	0.60
			Other ID ~		
			Sample Type ~	SOIL	SOIL
			Sampling Date ~	30/03/2024	30/03/2024
			Sampling Time ~	n/s	n/s
Test	**Method**	**LOD**	**Units**		
OCPs					
alpha-BHC	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
gamma-BHC (Lindane)	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
beta-BHC	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
delta-BHC	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Heptachlor	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Aldrin	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Heptachlor epoxide	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
gamma-Chlordane	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Endosulphan I & Alpha-chlorodane	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4,4-DDE	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dieldrin	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Endrin	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Endosulphan II & 4,4-DDD	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Endrin aldehyde	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4,4-DDT	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Endosulphan sulphate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Methoxychlor	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Endrin ketone	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1

Summary of Chemical Analysis
Threshold Breaches

Our Ref 24-06681
Client Ref ~
Contract Title ~ RIGIFA

Job	Lab No	Sample ID	Depth	Other ID	Test	Result	Threshold Upper	Lower	Threshold	SOM Result	SOM1/ SOM6
No Breaches											

Symbol key at end of report

Information in Support of the Analytical Results

Our Ref 24-06681
Client Ref ~
Contract ~ RIGIFA

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2319326	HP01 0.20 SOIL	30/03/24	GJ 250ml, GJ 60ml, PT 1L		
2319327	HP01 0.60 SOIL	30/03/24	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Key:

~ Sample details are provided by the client and can affect the validity of the results

***** -not accredited.

-MCERTS (accreditation only applies if report carries the MCERTS logo).

$ -subcontracted.

n/s -not supplied.

I/S -insufficient sample.

U/S -unsuitable sample.

t/f -to follow.

nd -not detected.

End of Report

LABORATORY TEST CERTIFICATE

MATtest Limited
materials testing & consultancy

10 Queenslie Point
Queenslie Industrial Estate
120 Stepps Road
Glasgow
G33 3NQ

Tel: 0141 774 4032

email: info@mattest.org
Website: www.mattest.org

Certificate No : **24/304 - 01-1**

To : **Mark Lane**

Client : **Curtins Ltd.**
1a Belford Road
Edinburgh
EH4 3BL

LABORATORY TESTING OF SOIL

Introduction

We refer to samples taken from Rigifa and delivered to our laboratory on 12th March 2024.

Material & Source

Sample Reference	:	See Report Plates
Sampled By	:	Client
Sampling Certificate	:	Not Supplied
Location	:	See Report Plates
Description	:	See Page 2 to Page 4 inclusive
Date Sampled	:	Not Supplied
Date Tested	:	12th March 2024 Onwards
Source	:	085449 - Rigifa

Test Results

As Detailed On Page 2 to Page 40 inclusive

Comments

The results contained in this report relate to the sample(s) as received
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
All remaining samples for this project will be disposed of 28 days after issue of this test certificate

Remarks

[redacted]

Date 09/04/2024

UKAS TESTING
2643

TRIAL PIT	SAMPLE	DEPTH (m)	SAMPLE DESCRIPTION
TP01	B	0.60	Brown slightly gravelly very sandy very silty CLAY. Gravel is fine to coarse.
TP02	B	0.60	Brown slightly silty clayey fine to coarse SAND and GRAVEL with black staining.
TP03	B	1.25	Brown fine to cobble-sized CRUSHED ROCK with cobbles.
TP04	B	1.00	Brown slightly clayey slightly sitly fine to coarse CRUSHED ROCK / highly weathered MUDSTONE.
TP05	B	1.50	Brown very gravelly very sandy very silty CLAY with root fibres. Gravel is fine to coarse.
TP07	B	1.00	Mottled brown / grey gravelly very silty very sandy CLAY. Gravel is fine to coarse.
TP08	B	1.00	Brown slightly clayey slightly silty fine to coarse CRUSHED ROCK.
TP09	B	0.60	Brown gravelly sandy CLAY with root fibres / black staining. Gravel is fine to coarse.
TP10	B	0.60	Brown very gravelly very clayey very sandy SILT with root fibres / black staining. Gravel is fine to coarse
TP11	B	0.60	Brown slightly silty very clayey fine to coarse CRUSHED ROCK with cobbles.
TP12	B	0.60	Brown slightly gravelly sandy CLAY with root fibres / black staining. Gravel is fine to medium.
TP13	B	1.50	Brown very gravelly slightly silty slightly sandy CLAY. Gravel is fine to coarse.
TP14	B	0.60	Brown gravelly sandy CLAY with black staining / root fibres. Gravel is fine to coarse.
TP15	B	0.60	Brown slightly gravelly very silty very sandy CLAY with root fibres. Gravel is fine to coarse.
TP17	B	0.25	Brown slightly gravelly very sandy PEAT. Gravel is fine to coarse. (Von Post Classification - H5)
TP18	B	1.00	Brown / grey gravelly very silty very sandy CLAY with black staining. Gravel is fine to coarse.
TP19	B	0.60	Brown slightly gravelly slightly silty sandy CLAY. Gravel is fine to coarse.
TP21	B	0.30	Brown very gravelly very sandy PEAT. Gravel is fine to coarse. (Von Post Classification - H5)
TP23	B	1.20	Brown clayey very silty very sandy fine to coarse GRAVEL.

SUMMARY OF SAMPLE DESCRIPTIONS

TRIAL PIT	SAMPLE	DEPTH (m)	SAMPLE DESCRIPTION
TP24	B	0.70	Brown slightly clayey silty CRUSHED ROCK / highly weathered MUDSTONE.
TP25	B	0.90	Brown slightly gravelly very sandy very silty CLAY with root fibres / black staining. Gravel is fine to medium.
TP27	B	1.00	Brown clayey silty fine to coarse SAND and GRAVEL with cobbles and highly weathered mudstone fragments.
TP28	B	0.60	Brown slightly clayey PEAT. (Von Post Classification - H5)

SUMMARY OF SAMPLE DESCRIPTIONS

BOREHOLE	SAMPLE	DEPTH (m)	SAMPLE DESCRIPTION
BH01	B	0.80	Brown slightly gravelly very sandy CLAY with root fibres. Gravel is fine to coarse.
BH03	B	1.90	Brown slightly gravelly sandy CLAY with root fibres. Gravel is fine to coarse.
BH04	B	1.00	Brown gravelly sandy CLAY with root fibres. Gravel is fine to coarse.
BH05	B	1.80	Brown very gravelly very sandy CLAY / TOPSOIL with root fibres. Gravel is fine to coarse.
BH06	B	1.80	Brown silty sandy clayey fine to coarse GRAVEL with root fibres.
BH07	B	1.20-1.60	Brown very gravelly very silty very sandy CLAY with root fibres / black staining. Gravel is fine to coarse.

SUMMARY OF SAMPLE DESCRIPTIONS

TRIAL PIT	SAMPLE	DEPTH (m)	WATER CONTENT (%)
TP01	B	0.60	23.0
TP03	B	1.25	11.0
TP05	B	1.50	17.3
TP07	B	1.00	22.3
TP08	B	1.00	15.5
TP10	B	0.60	18.1
TP11	B	0.60	12.8
TP13	B	1.50	20.0
TP15	B	0.60	17.6
TP17	B	0.25	66.2
TP18	B	1.00	18.6
TP21	B	0.30	41.8
TP23	B	1.20	21.2
TP25	B	0.90	24.9
TP27	B	1.00	17.3
TP28	B	0.60	30.9

Tested in accordance with BS 1377 - 2 : 2022 : Clause 4.1

SUMMARY OF WATER CONTENT TEST RESULTS

BOREHOLE	SAMPLE	DEPTH (m)	WATER CONTENT (%)
BH01	B	0.80	26.4
BH03	B	1.90	27.5
BH05	B	1.80	29.8
BH06	B	1.80	19.2

Tested in accordance with BS 1377 - 2 : 2022 : Clause 4.1

SUMMARY OF WATER CONTENT TEST RESULTS

TRIAL PIT	SAMPLE	DEPTH (m)	WATER CONTENT (%)	BULK DENSITY (Mg/m^3)	DRY DENSITY (Mg/m^3)
TP02	B	0.60	16.7	1.99	1.71
TP04	B	1.00	15.8	1.98	1.71
TP09	B	0.60	22.3	1.92	1.57
TP12	B	0.60	18.2	1.97	1.67
TP14	B	0.60	17.5	1.99	1.69
TP19	B	0.60	22.8	1.97	1.60
TP27	B	1.00	17.3	1.96	1.67

Tested in accordance with BS 1377 - 2 : 2022 : Clause 8
Bulk Density : Linear Measurement

SUMMARY OF WATER CONTENT AND BULK DENSITY TEST RESULTS

BOREHOLE	SAMPLE	DEPTH (m)	WATER CONTENT (%)	BULK DENSITY (Mg/m^3)	DRY DENSITY (Mg/m^3)
BH04	B	1.00	17.7	1.94	1.65

Tested in accordance with BS 1377 - 2 : 2022 : Clause 8
Bulk Density : Linear Measurement

SUMMARY OF WATER CONTENT AND BULK DENSITY TEST RESULTS

TRIAL PIT	SAMPLE	DEPTH (m)	PARTICLE DENSITY (Mg/m³)
TP02	B	0.60	2.58
TP04	B	1.00	2.56
TP09	B	0.60	2.55
TP12	B	0.60	2.47
TP14	B	0.60	2.49
TP19	B	0.60	2.52
TP24	B	0.70	2.51
TP27	B	1.00	2.50

Tested in accordance with BS 1377 - 2 : 2022 : Clause 9.2
(Gas jar method)

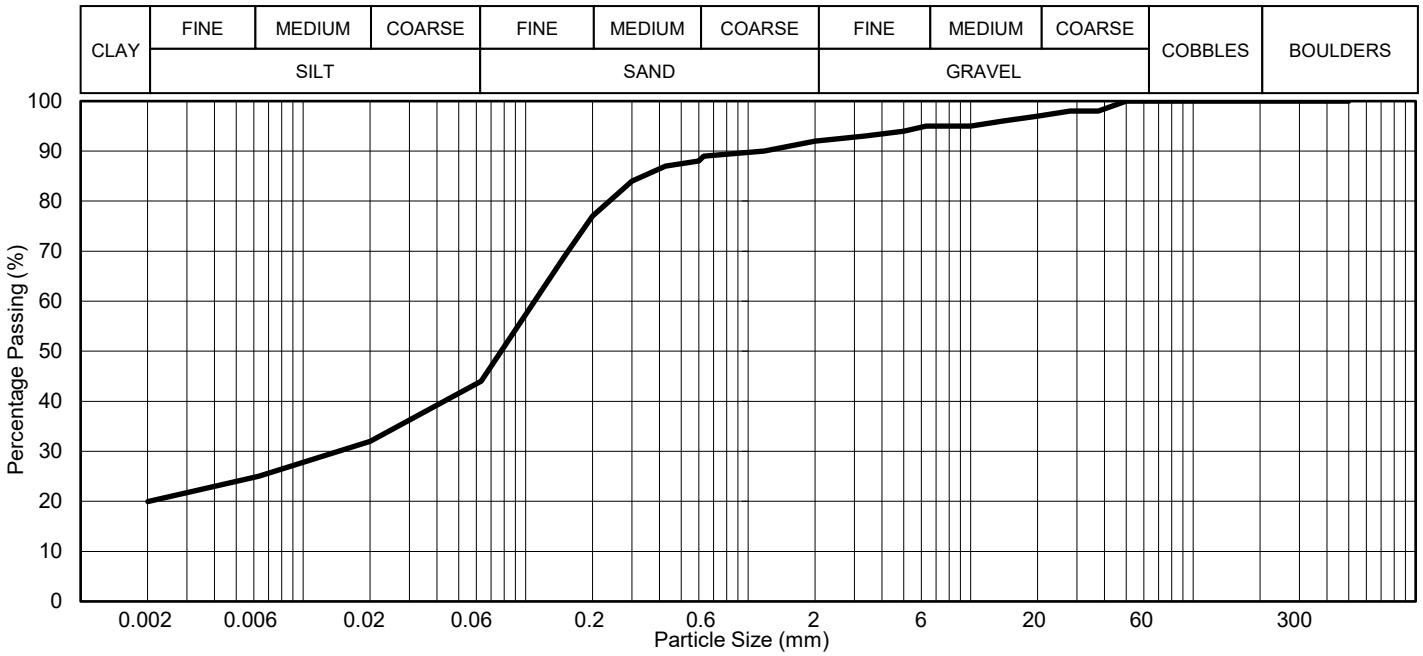
SUMMARY OF PARTICLE DENSITY TEST RESULTS

BOREHOLE	SAMPLE	DEPTH (m)	PARTICLE DENSITY (Mg/m³)
BH04	B	1.00	2.49

Tested in accordance with BS 1377 - 2 : 2022 : Clause 9.2
(Gas jar method)

SUMMARY OF PARTICLE DENSITY TEST RESULTS

Borehole	TP01
Sample	B
Depth (m)	0.60



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	32
300.0	100	-	-	0.0063	25
125.0	100	-	-	0.0020	20
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	98	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	98	-	-		
20.0	97	-	-		
14.0	96	-	-		
10.0	95	-	-	**PERCENTAGE SOIL TYPES**	
6.3	95	-	-		
5.0	94	-	-		
3.350	93	-	-		
2.000	92	-	-		
1.180	90	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	89	-	-		
0.600	88	-	-		
0.425	87	-	-		
0.300	84	-	-		
0.200	77	-	-		
0.150	69	-	-		
0.063	44	-	-		

CLAY	SILT ₸	SAND	GRAVEL	COBBLES
20	24	48	8	0

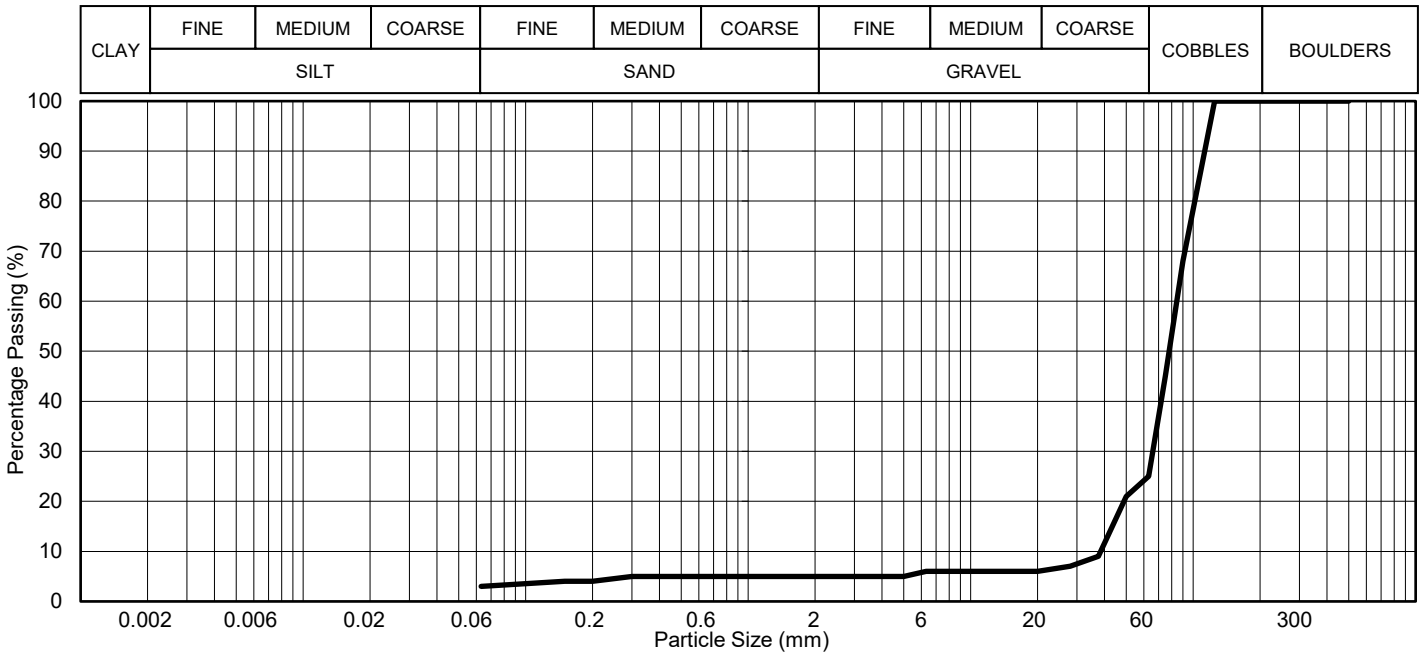
D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP03
Sample	B
Depth (m)	1.25



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	
300.0	100	-	-	0.0063	
125.0	100	-	-	0.0020	
90.0	68	-	-		
75.0	45	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	25	-	-	-	
50.0	21	-	-		
37.5	9	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	7	-	-		
20.0	6	-	-		
14.0	6	-	-		
10.0	6	-	-	**PERCENTAGE SOIL TYPES**	
6.3	6	-	-		
5.0	5	-	-		
3.350	5	-	-		
2.000	5	-	-		
1.180	5	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	5	-	-		
0.600	5	-	-		
0.425	5	-	-		
0.300	5	-	-		
0.200	4	-	-		
0.150	4	-	-		
0.063	3	-	-		

CLAY	SILT ₸	SAND	GRAVEL	COBBLES
/	3	2	20	75

D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

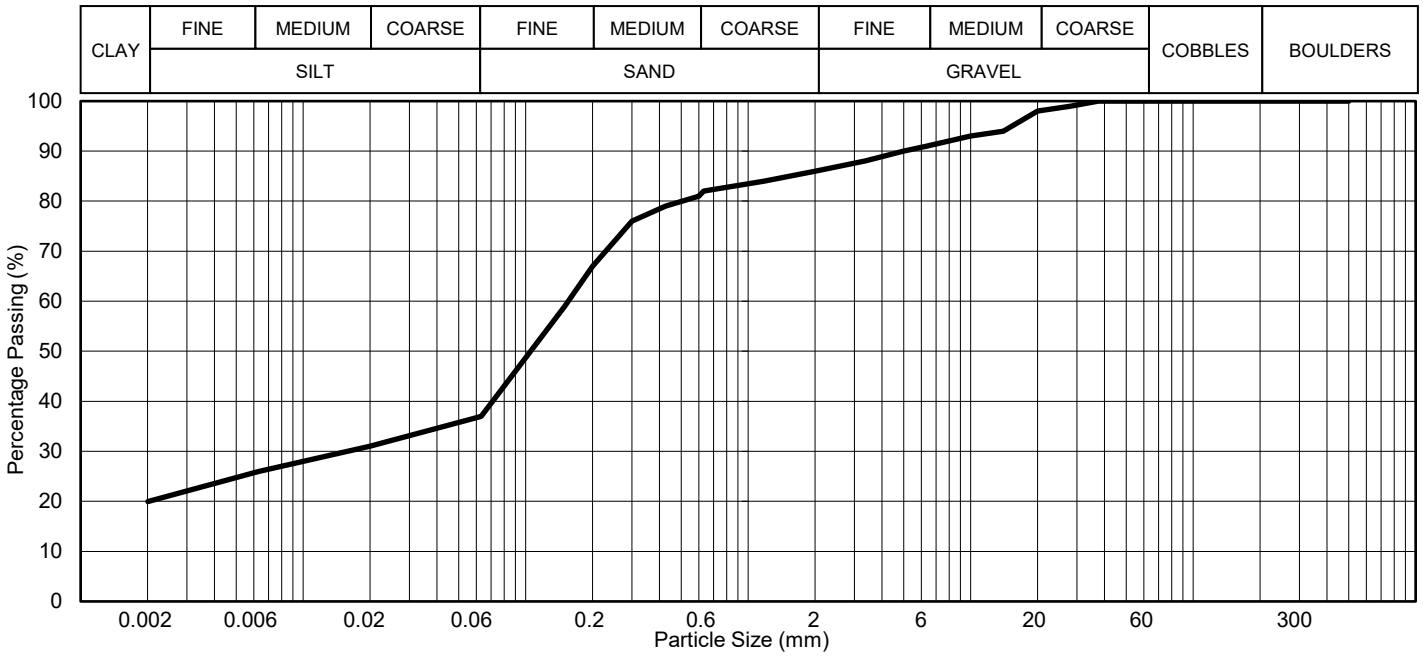
Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

Sample does not meet minimum mass requirement for material type

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP05
Sample	B
Depth (m)	1.50



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	31
300.0	100	-	-	0.0063	26
125.0	100	-	-	0.0020	20
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	100	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	99	-	-		
20.0	98	-	-		
14.0	94	-	-		
10.0	93	-	-	**PERCENTAGE SOIL TYPES**	
6.3	91	-	-		
5.0	90	-	-		
3.350	88	-	-		
2.000	86	-	-		
1.180	84	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	82	-	-		
0.600	81	-	-		
0.425	79	-	-		
0.300	76	-	-		
0.200	67	-	-		
0.150	59	-	-		
0.063	37	-	-		

CLAY	SILT ₸	SAND	GRAVEL	COBBLES
20	17	49	14	0

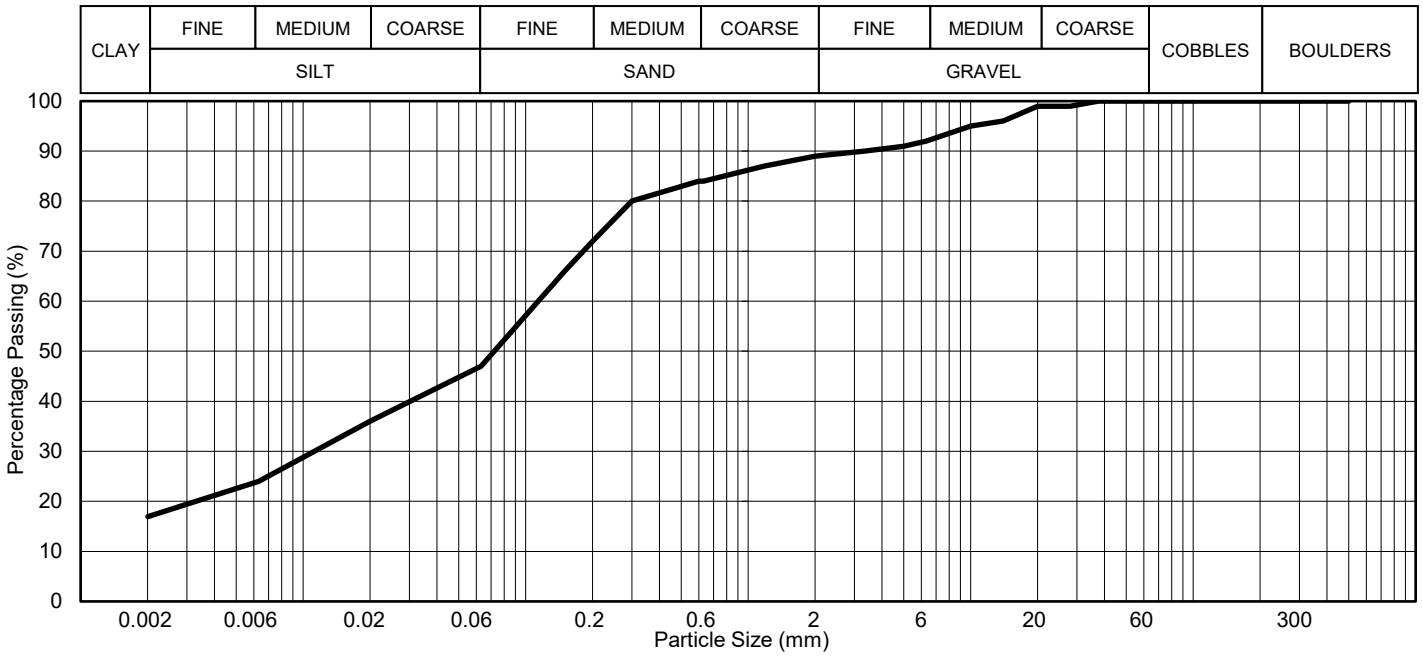
D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP07
Sample	B
Depth (m)	1.00



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	36
300.0	100	-	-	0.0063	24
125.0	100	-	-	0.0020	17
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	100	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	99	-	-		
20.0	99	-	-		
14.0	96	-	-		
10.0	95	-	-	**PERCENTAGE SOIL TYPES**	
6.3	92	-	-		
5.0	91	-	-		
3.350	90	-	-		
2.000	89	-	-		
1.180	87	-	-		
0.630	84	-	-		
0.600	84	-	-		
0.425	82	-	-		
0.300	80	-	-		
0.200	72	-	-		
0.150	66	-	-		
0.063	47	-	-		

CLAY	SILT Ŧ	SAND	GRAVEL	COBBLES
17	30	42	11	0

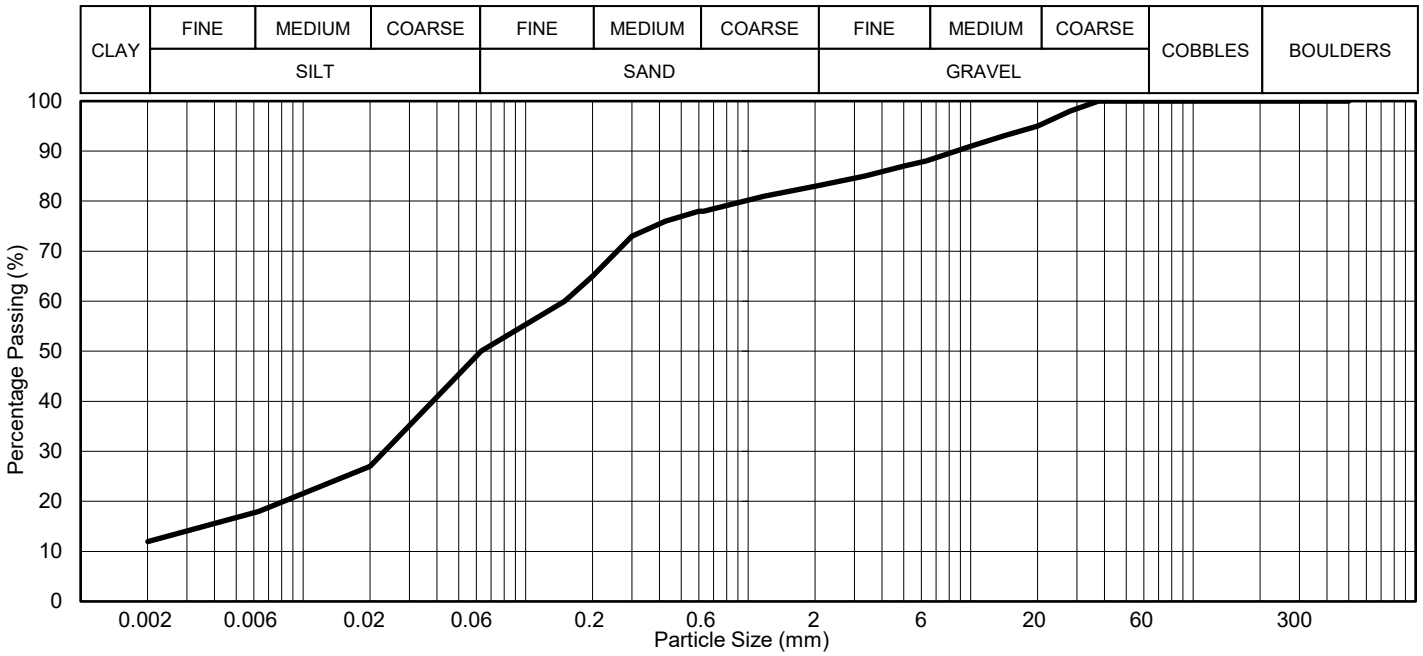
UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)		
D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT -		-

Remarks

Ŧ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP10
Sample	B
Depth (m)	0.60



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	27
300.0	100	-	-	0.0063	18
125.0	100	-	-	0.0020	12
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	100	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	98	-	-		
20.0	95	-	-		
14.0	93	-	-		
10.0	91	-	-	**PERCENTAGE SOIL TYPES**	
6.3	88	-	-		
5.0	87	-	-		
3.350	85	-	-		
2.000	83	-	-		
1.180	81	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	78	-	-		
0.600	78	-	-		
0.425	76	-	-		
0.300	73	-	-		
0.200	65	-	-		
0.150	60	-	-		
0.063	50	-	-		

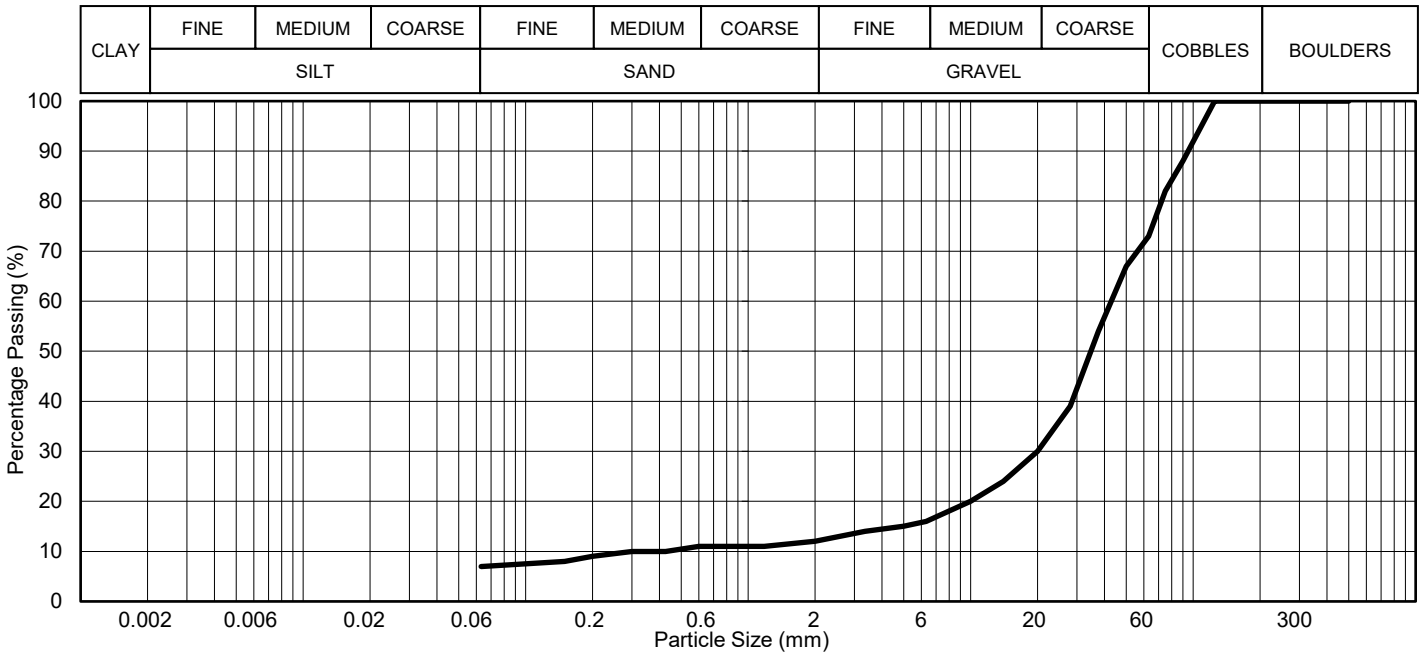
CLAY	SILT ₸	SAND	GRAVEL	COBBLES
12	38	33	17	0

D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

Borehole	TP11
Sample	B
Depth (m)	0.60



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	
300.0	100	-	-	0.0063	
125.0	100	-	-	0.0020	
90.0	88	-	-		
75.0	82	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	73	-	-	-	
50.0	67	-	-		
37.5	54	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	39	-	-		
20.0	30	-	-		
14.0	24	-	-		
10.0	20	-	-	**PERCENTAGE SOIL TYPES**	
6.3	16	-	-	**CLAY** / **SILT Ŧ** / **SAND** / **GRAVEL** / **COBBLES**	
5.0	15	-	-		
3.350	14	-	-	/ 7 5 61 27	
2.000	12	-	-		
1.180	11	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	11	-	-	**D10** / **D60** / **Specification**	
0.600	11	-	-		
0.425	10	-	-	- -	
0.300	10	-	-	**UNIFORMITY COEFFICIENT** - -	
0.200	9	-	-		
0.150	8	-	-		
0.063	7	-	-		

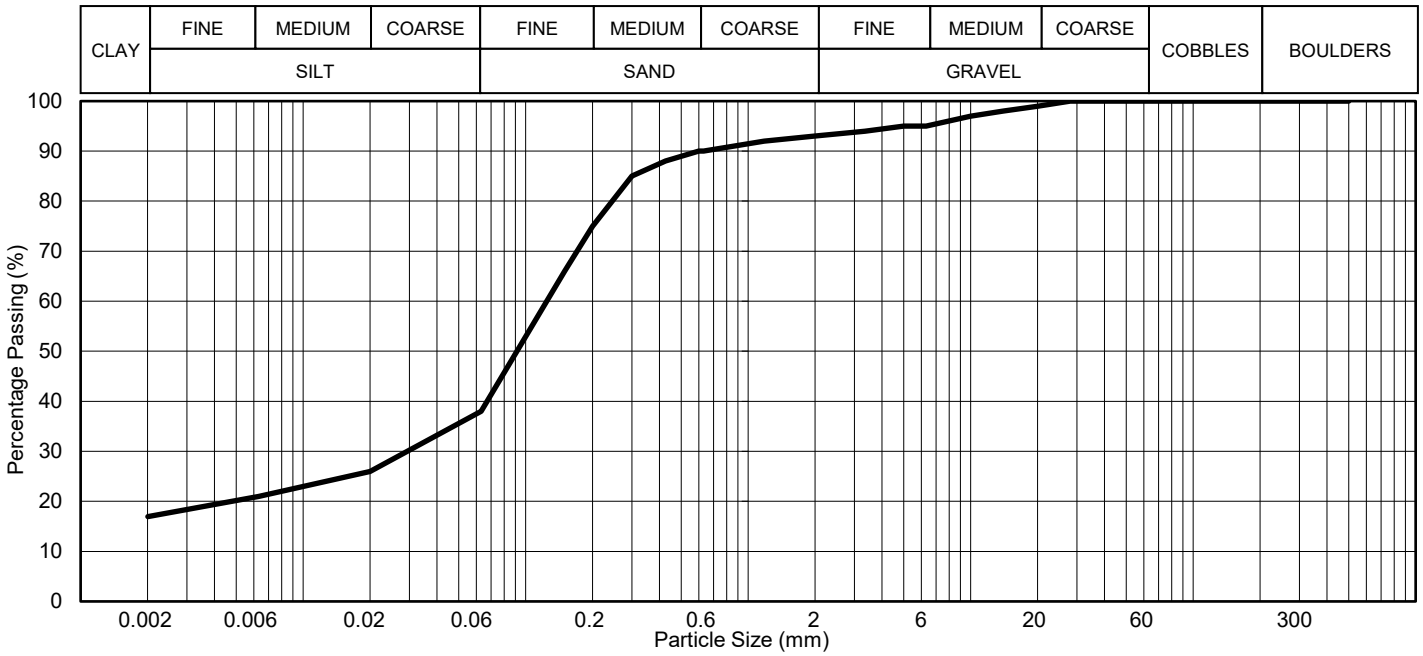
Remarks

Ŧ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

Sample does not meet minimum mass requirement for material type

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP15
Sample	B
Depth (m)	0.60



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	26
300.0	100	-	-	0.0063	21
125.0	100	-	-	0.0020	17
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	100	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	100	-	-		
20.0	99	-	-		
14.0	98	-	-		
10.0	97	-	-	**PERCENTAGE SOIL TYPES**	
6.3	95	-	-		
5.0	95	-	-		
3.350	94	-	-		
2.000	93	-	-		
1.180	92	-	-		
0.630	90	-	-		
0.600	90	-	-		
0.425	88	-	-		
0.300	85	-	-		
0.200	75	-	-		
0.150	66	-	-		
0.063	38	-	-		

CLAY	SILT ₸	SAND	GRAVEL	COBBLES
17	21	55	7	0

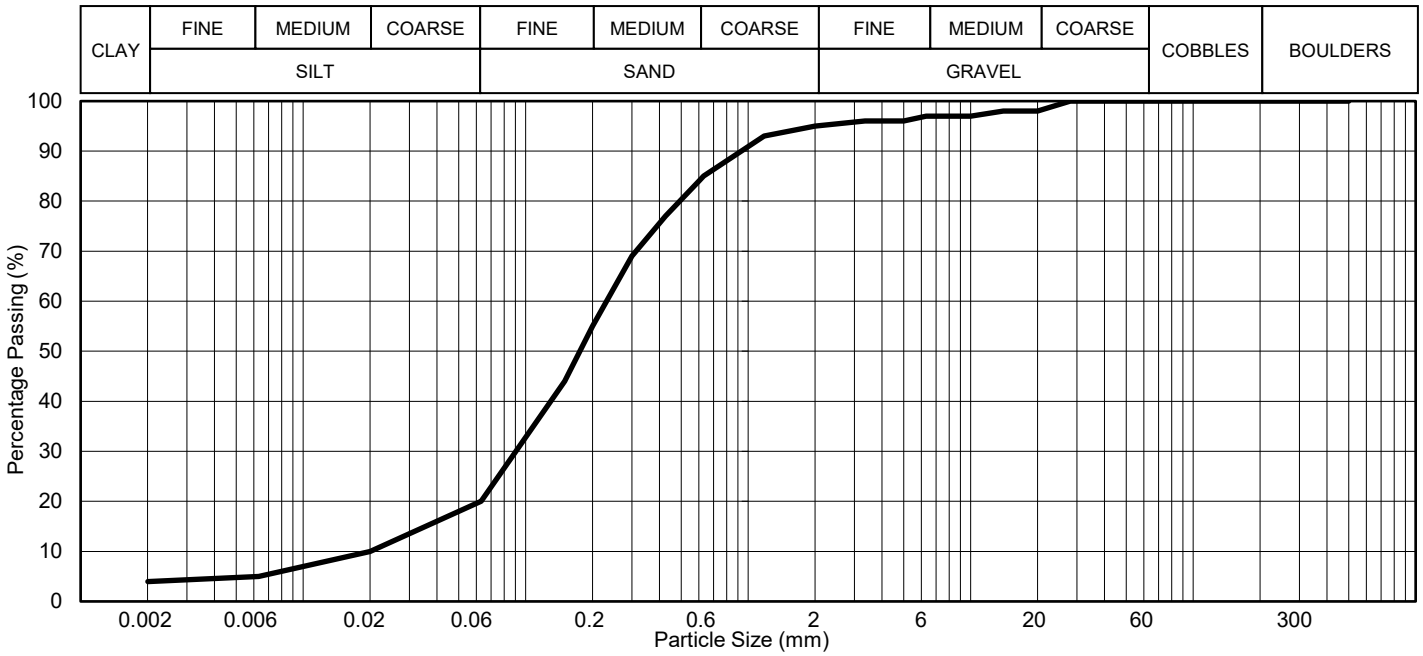
UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)		
D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT -		-

Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP17
Sample	B
Depth (m)	0.25



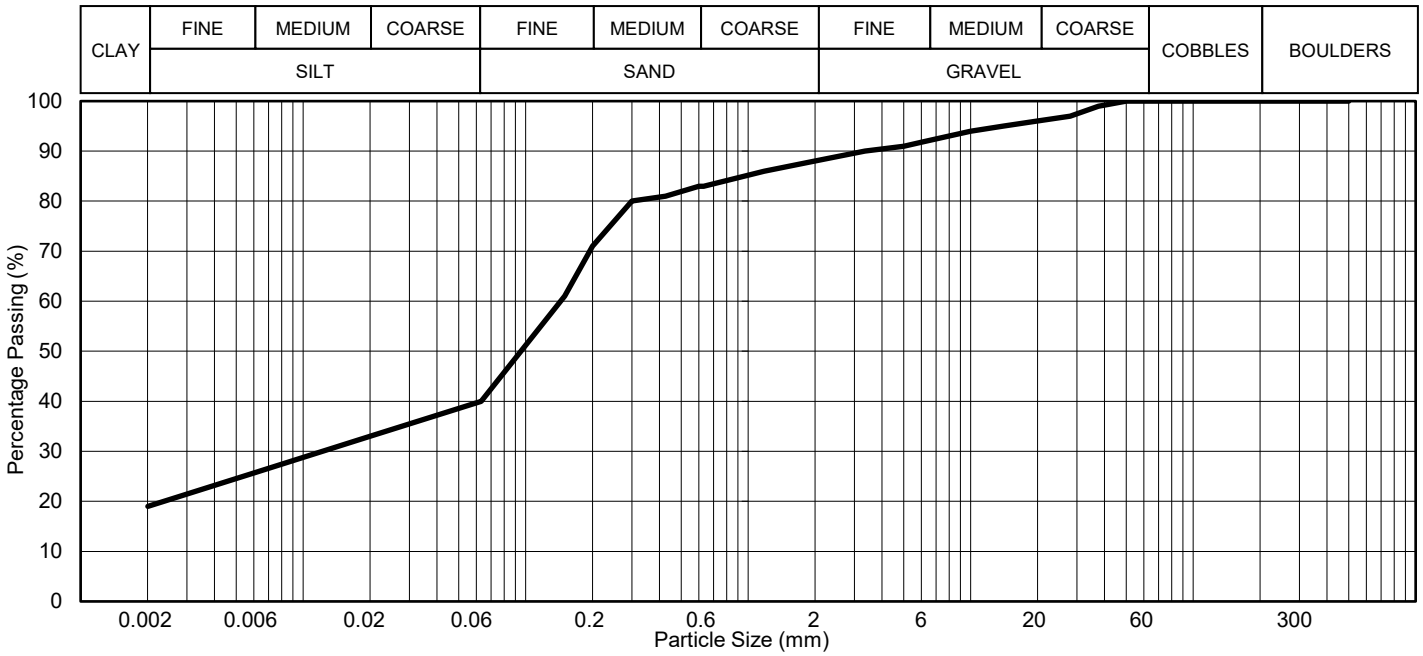
SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	10
300.0	100	-	-	0.0063	5
125.0	100	-	-	0.0020	4
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	100	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	100	-	-		
20.0	98	-	-		
14.0	98	-	-		
10.0	97	-	-	**PERCENTAGE SOIL TYPES**	
6.3	97	-	-	**CLAY** / **SILT ₸** / **SAND** / **GRAVEL** / **COBBLES**	
5.0	96	-	-		
3.350	96	-	-	4 / 16 / 75 / 5 / 0	
2.000	95	-	-		
1.180	93	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	85	-	-	**D10** / **D60** / **Specification**	
0.600	84	-	-		
0.425	77	-	-	- / -	
0.300	69	-	-	**UNIFORMITY COEFFICIENT** - / -	
0.200	55	-	-		
0.150	44	-	-		
0.063	20	-	-		

Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP18
Sample	B
Depth (m)	1.00



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	33
300.0	100	-	-	0.0063	26
125.0	100	-	-	0.0020	19
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	99	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	97	-	-		
20.0	96	-	-		
14.0	95	-	-		
10.0	94	-	-	**PERCENTAGE SOIL TYPES**	
6.3	92	-	-		
5.0	91	-	-		
3.350	90	-	-		
2.000	88	-	-		
1.180	86	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	83	-	-		
0.600	83	-	-		
0.425	81	-	-		
0.300	80	-	-		
0.200	71	-	-		
0.150	61	-	-		
0.063	40	-	-		

CLAY	SILT Ŧ	SAND	GRAVEL	COBBLES
19	21	48	12	0

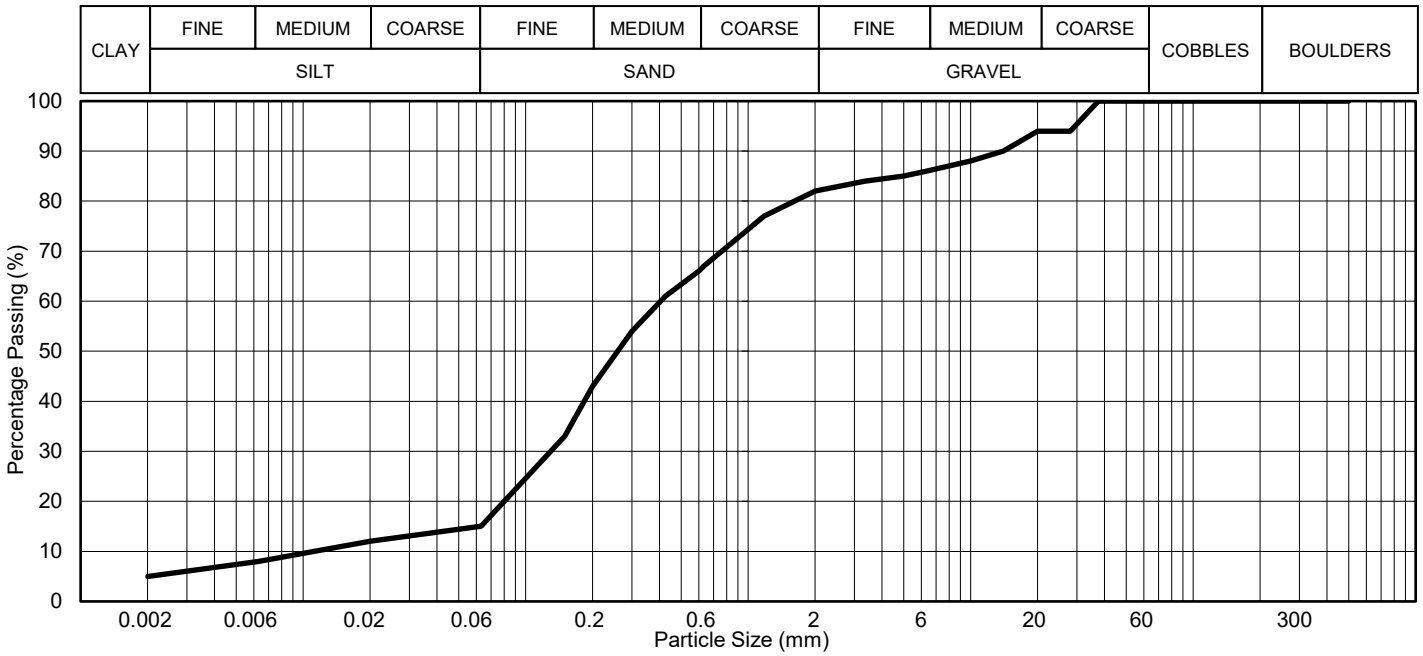
D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

Remarks

Ŧ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP21
Sample	B
Depth (m)	0.30



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	12
300.0	100	-	-	0.0063	8
125.0	100	-	-	0.0020	5
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	100	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	94	-	-		
20.0	94	-	-		
14.0	90	-	-		
10.0	88	-	-	**PERCENTAGE SOIL TYPES**	
6.3	86	-	-		
5.0	85	-	-		
3.350	84	-	-		
2.000	82	-	-		
1.180	77	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	67	-	-		
0.600	66	-	-		
0.425	61	-	-		
0.300	54	-	-		
0.200	43	-	-		
0.150	33	-	-		
0.063	15	-	-		

CLAY	SILT ₸	SAND	GRAVEL	COBBLES
5	10	67	18	0

D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

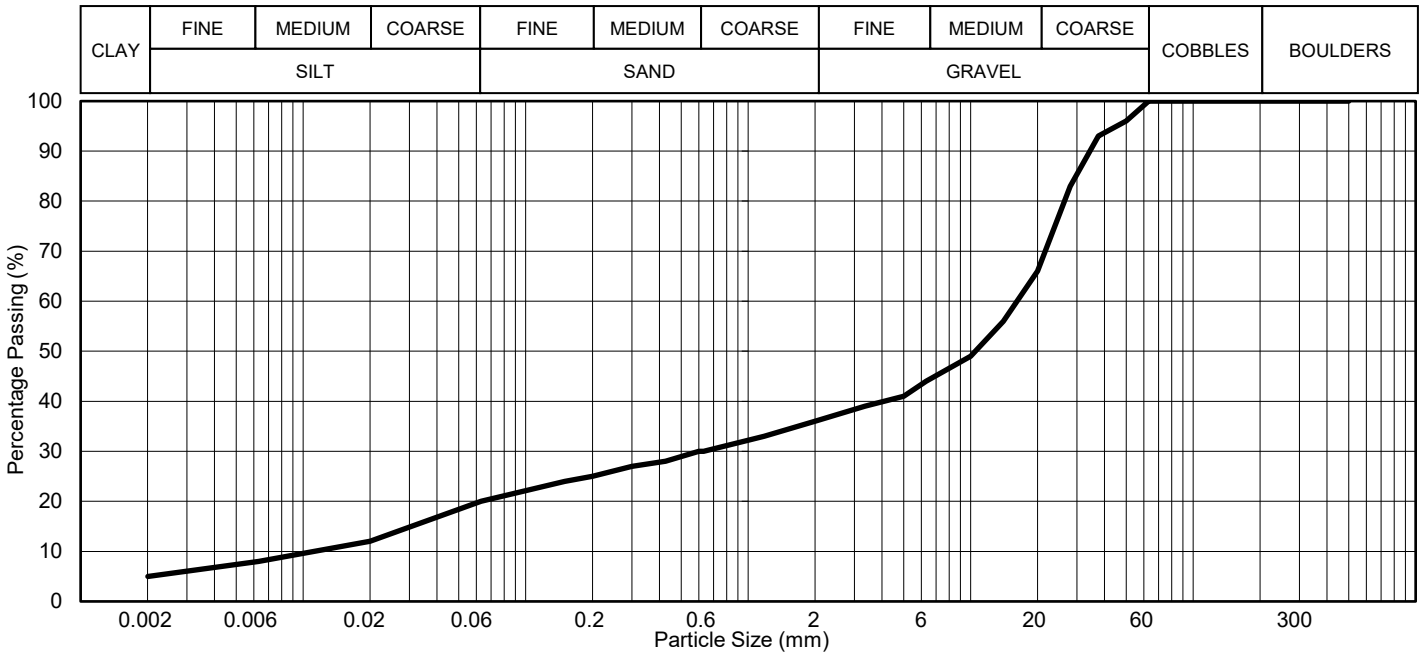
Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

Sample does not meet minimum mass requirement for material type

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP23
Sample	B
Depth (m)	1.20



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	12
300.0	100	-	-	0.0063	8
125.0	100	-	-	0.0020	5
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	96	-	-		
37.5	93	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	83	-	-		
20.0	66	-	-		
14.0	56	-	-		
10.0	49	-	-	**PERCENTAGE SOIL TYPES**	
6.3	44	-	-		
5.0	41	-	-		
3.350	39	-	-		
2.000	36	-	-		
1.180	33	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	30	-	-		
0.600	30	-	-		
0.425	28	-	-		
0.300	27	-	-		
0.200	25	-	-		
0.150	24	-	-		
0.063	20	-	-		

CLAY	SILT ₸	SAND	GRAVEL	COBBLES
5	15	16	64	0

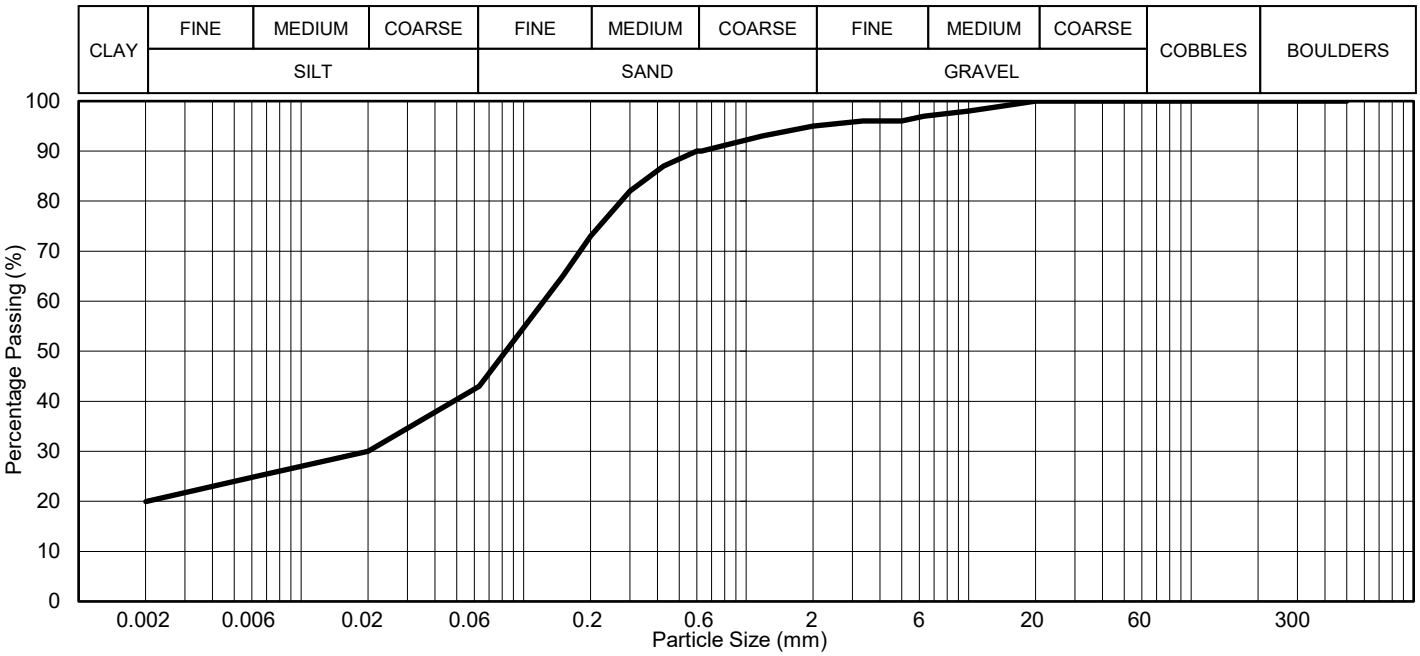
D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP25
Sample	B
Depth (m)	0.90



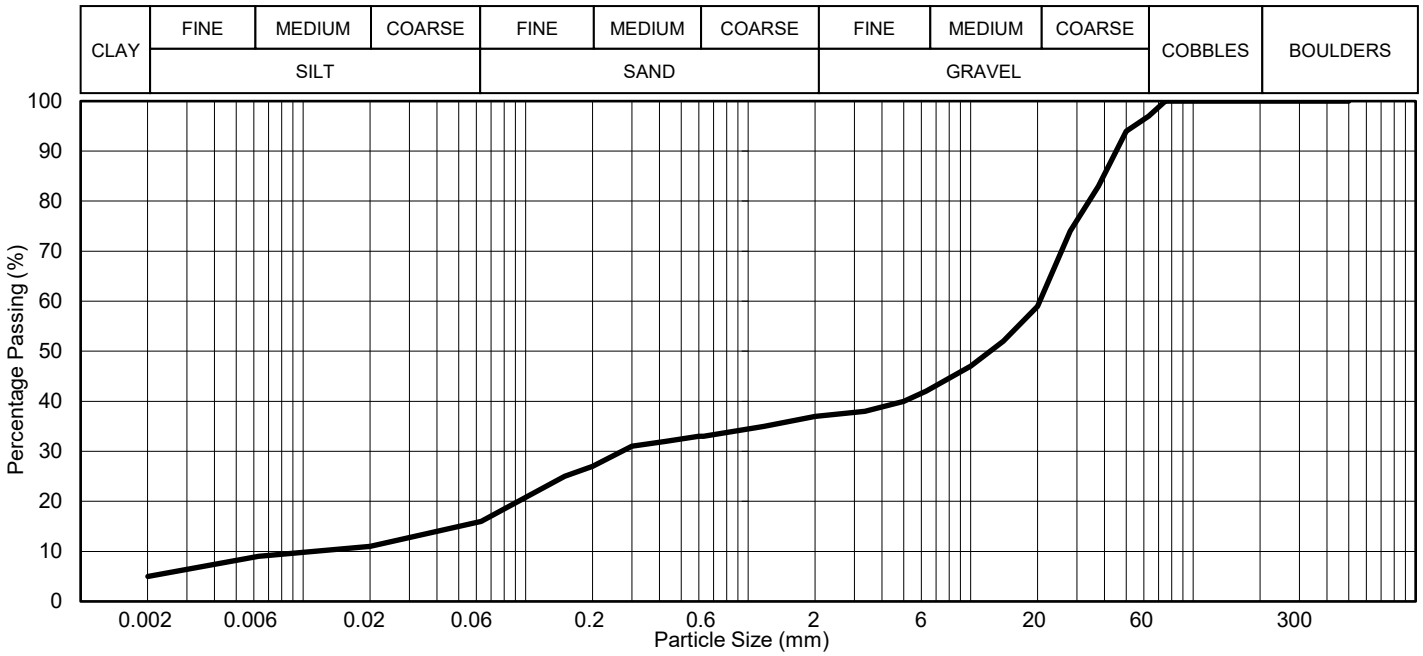
SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	30
300.0	100	-	-	0.0063	25
125.0	100	-	-	0.0020	20
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	100	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	100	-	-		
20.0	100	-	-		
14.0	99	-	-		
10.0	98	-	-	**PERCENTAGE SOIL TYPES**	
6.3	97	-	-	**CLAY** / **SILT Ŧ** / **SAND** / **GRAVEL** / **COBBLES**	
5.0	96	-	-		
3.350	96	-	-	20 / 23 / 52 / 5 / 0	
2.000	95	-	-		
1.180	93	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	90	-	-	**D10** / **D60** / **Specification**	
0.600	90	-	-		
0.425	87	-	-	- / -	
0.300	82	-	-	**UNIFORMITY COEFFICIENT** - / -	
0.200	73	-	-		
0.150	65	-	-		
0.063	43	-	-		

Remarks

Ŧ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	TP27
Sample	B
Depth (m)	1.00



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	11
300.0	100	-	-	0.0063	9
125.0	100	-	-	0.0020	5
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	97	-	-	-	
50.0	94	-	-		
37.5	83	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	74	-	-		
20.0	59	-	-		
14.0	52	-	-		
10.0	47	-	-	**PERCENTAGE SOIL TYPES**	
6.3	42	-	-		
5.0	40	-	-		
3.350	38	-	-		
2.000	37	-	-		
1.180	35	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	33	-	-		
0.600	33	-	-		
0.425	32	-	-		
0.300	31	-	-		
0.200	27	-	-		
0.150	25	-	-		
0.063	16	-	-		

CLAY	SILT Ŧ	SAND	GRAVEL	COBBLES
5	11	21	60	3

D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

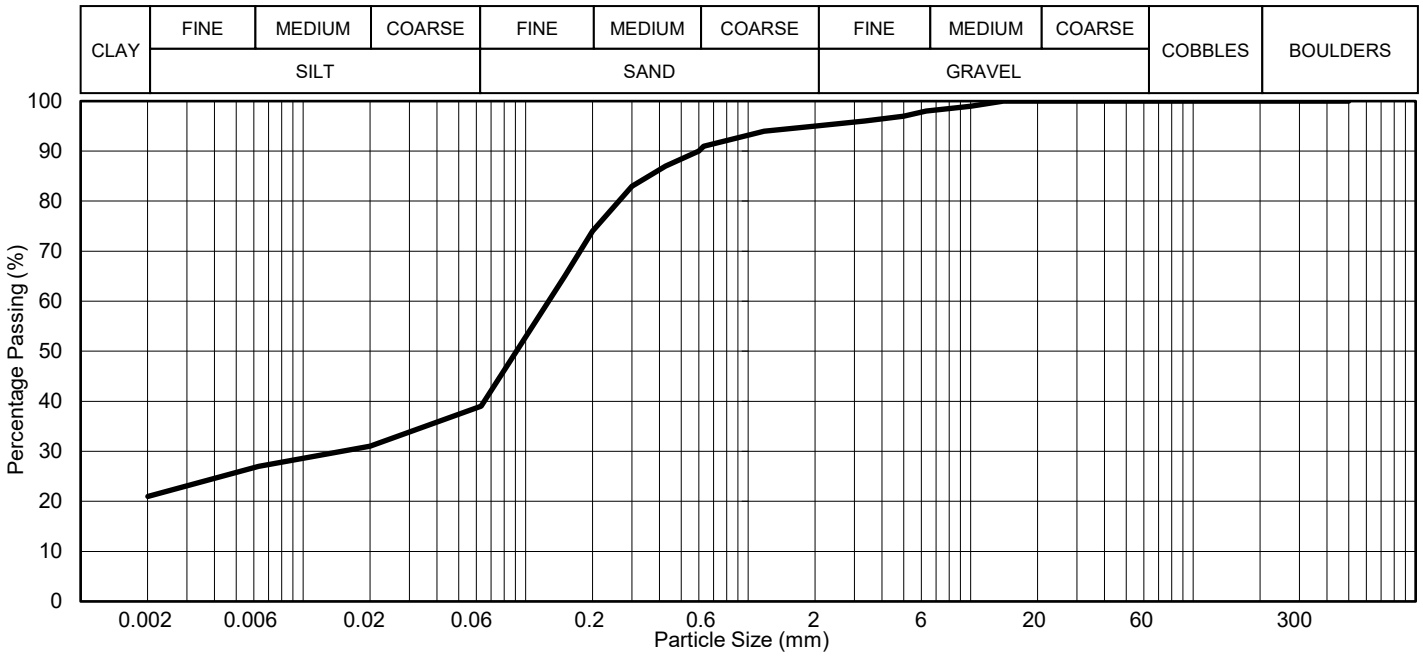
Remarks

Ŧ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

Sample does not meet minimum mass requirement for material type

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	BH01
Sample	B
Depth (m)	0.80



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	31
300.0	100	-	-	0.0063	27
125.0	100	-	-	0.0020	21
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	100	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	100	-	-		
20.0	100	-	-		
14.0	100	-	-		
10.0	99	-	-	**PERCENTAGE SOIL TYPES**	
6.3	98	-	-		
5.0	97	-	-		
3.350	96	-	-		
2.000	95	-	-		
1.180	94	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	91	-	-		
0.600	90	-	-		
0.425	87	-	-		
0.300	83	-	-		
0.200	74	-	-		
0.150	65	-	-		
0.063	39	-	-		

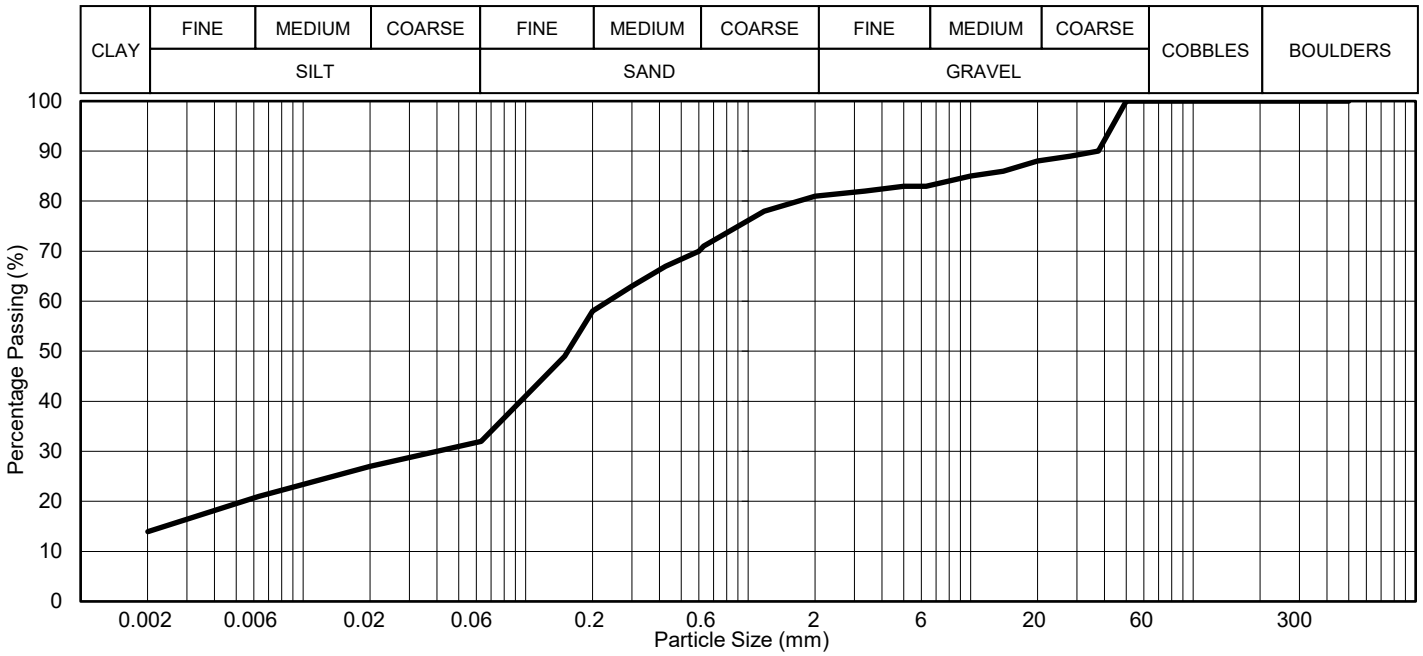
CLAY	SILT ₸	SAND	GRAVEL	COBBLES
21	18	56	5	0

D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

Borehole	BH05
Sample	B
Depth (m)	1.80



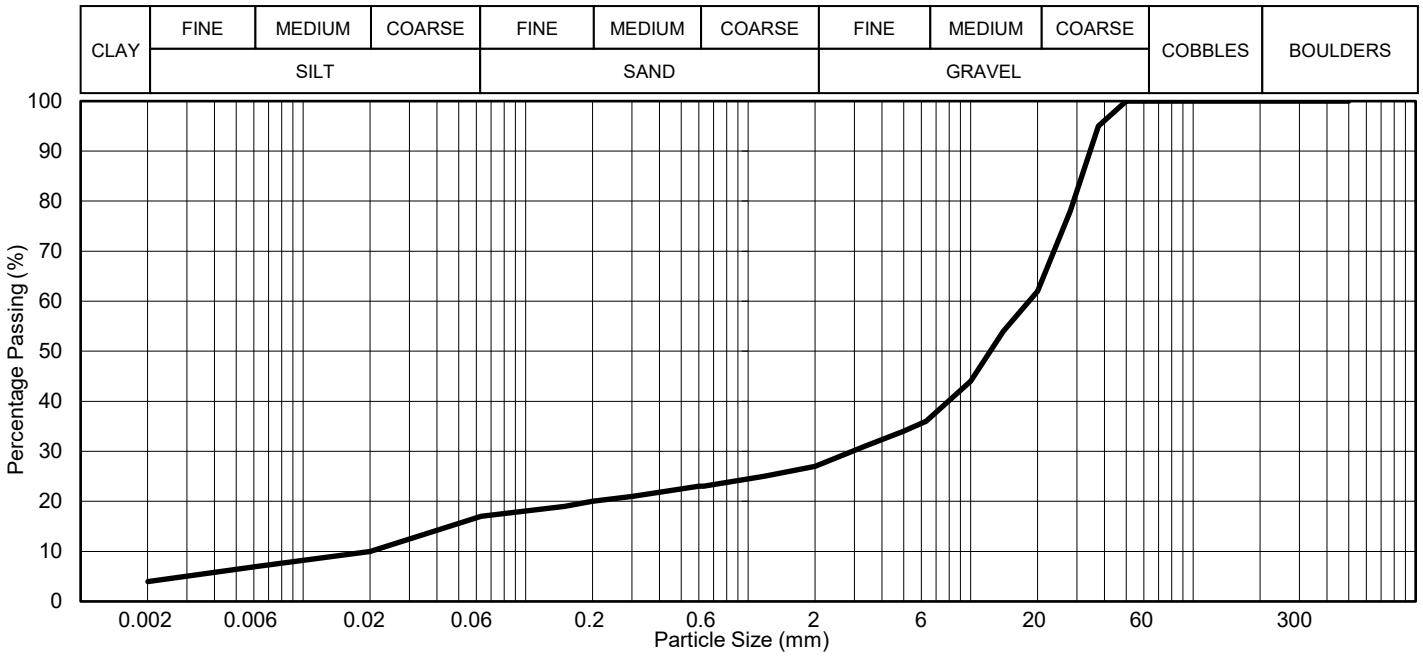
SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	27
300.0	100	-	-	0.0063	21
125.0	100	-	-	0.0020	14
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	90	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	89	-	-		
20.0	88	-	-		
14.0	86	-	-		
10.0	85	-	-	**PERCENTAGE SOIL TYPES**	
6.3	83	-	-	**CLAY** / **SILT ₸** / **SAND** / **GRAVEL** / **COBBLES**	
5.0	83	-	-		
3.350	82	-	-	14 / 18 / 49 / 19 / 0	
2.000	81	-	-		
1.180	78	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	71	-	-	**D10** / **D60** / **Specification**	
0.600	70	-	-		
0.425	67	-	-	- / -	
0.300	63	-	-	**UNIFORMITY COEFFICIENT** - / -	
0.200	58	-	-		
0.150	49	-	-		
0.063	32	-	-		

Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	BH06
Sample	B
Depth (m)	1.80



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	10
300.0	100	-	-	0.0063	7
125.0	100	-	-	0.0020	4
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	95	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	78	-	-		
20.0	62	-	-		
14.0	54	-	-		
10.0	44	-	-	**PERCENTAGE SOIL TYPES**	
6.3	36	-	-		
5.0	34	-	-		
3.350	31	-	-		
2.000	27	-	-		
1.180	25	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	23	-	-		
0.600	23	-	-		
0.425	22	-	-		
0.300	21	-	-		
0.200	20	-	-		
0.150	19	-	-		
0.063	17	-	-		

CLAY	SILT ₸	SAND	GRAVEL	COBBLES
4	13	10	73	0

D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

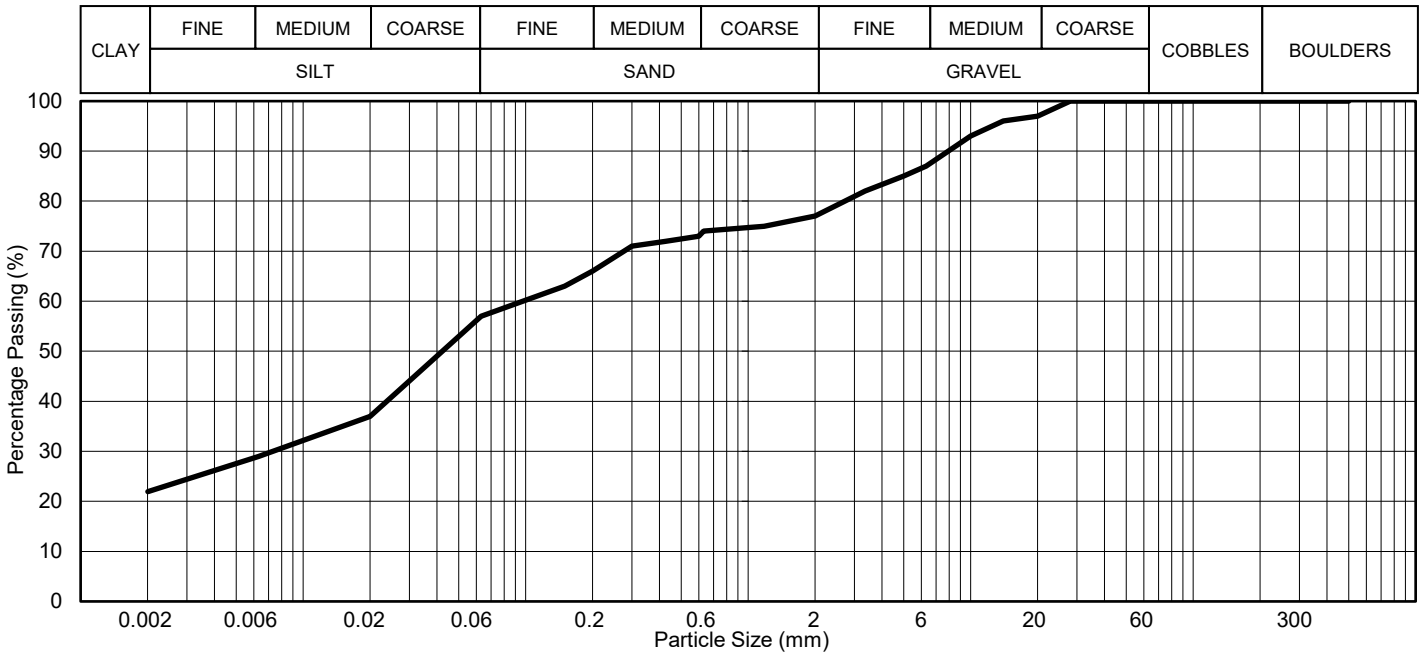
Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

Sample does not meet minimum mass requirement for material type

PARTICLE SIZE DISTRIBUTION - BS 1377 - 2 : 2022 : CLAUSE 10

Borehole	BH07
Sample	B
Depth (m)	1.20-1.60



SIEVING				SEDIMENTATION (Assumed ρs of 2.65Mg/m³)	
Sieve Size (mm)	Percentage Passing (%)	Specification Not Applicable		Particle Size (mm)	Percentage Passing (%)
		Lower %	Upper %		
500.0	100	-	-	0.0200	37
300.0	100	-	-	0.0063	29
125.0	100	-	-	0.0020	22
90.0	100	-	-		
75.0	100	-	-	**GRADING CLASSIFICATION (SHW TABLE 6/2)**	
63.0	100	-	-	-	
50.0	100	-	-		
37.5	100	-	-	Grading classification proves the material has met the relevant grading requirements only. Further testing may be required to assess compliance with SHW.	
28.0	100	-	-		
20.0	97	-	-		
14.0	96	-	-		
10.0	93	-	-	**PERCENTAGE SOIL TYPES**	
6.3	87	-	-		
5.0	85	-	-		
3.350	82	-	-		
2.000	77	-	-		
1.180	75	-	-	**UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5)**	
0.630	74	-	-		
0.600	73	-	-		
0.425	72	-	-		
0.300	71	-	-		
0.200	66	-	-		
0.150	63	-	-		
0.063	57	-	-		

CLAY	SILT ₸	SAND	GRAVEL	COBBLES
22	35	20	23	0

D10	D60	Specification
-	-	
UNIFORMITY COEFFICIENT	-	-

Remarks

₸ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns

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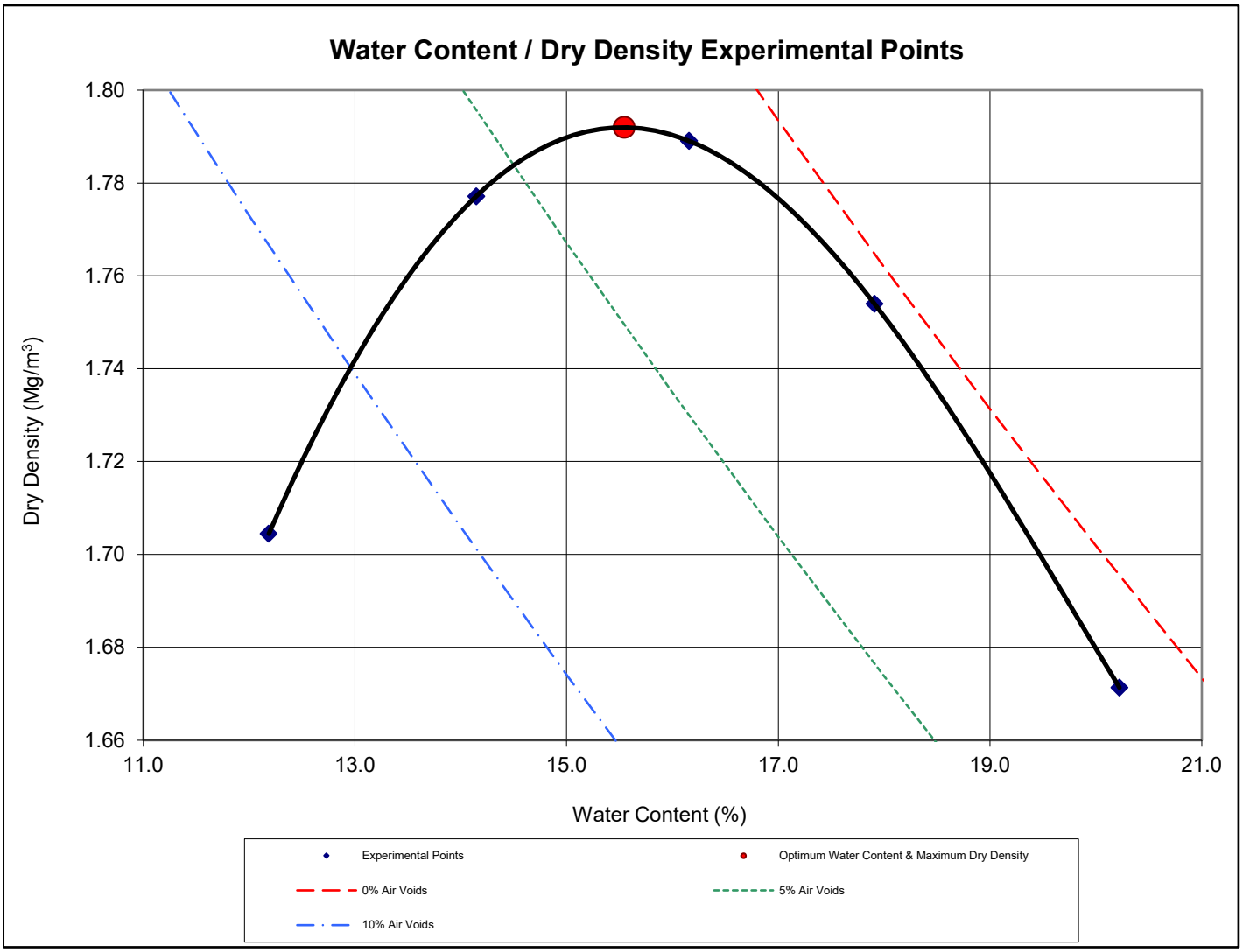

Test Method	:	Clause 11.6: 4.5kg rammer, 5 layers, 62 blows/layer	
Preparation Method	:	Separate samples	
% Passing 37.5mm	:	85	
% Passing 20mm	:	76	
Grading Zone	:	x	
Particle Density	:	2.58	Mg/m^3 (Measured in accordance with BS 1377 - 2 : 2022 : Clause 9)

Experimental Points	
Water Content (%)	Dry Density (Mg/m^3)
12.2	1.70
14.1	1.78
16.2	1.79
17.9	1.75
20.2	1.67

Optimum Water Content (%)	**Maximum Dry Density (Mg/m^3)**
15.5	**1.79**

Remarks

Materials which contain more than 10% retained on a 37.5mm test sieve and 30% retained on a 20mm test sieve are not suitable for this test (Zone X - BS 1377 - 2 : 2022 : 11, Figure 4). In this instance only material passing the 37.5mm sieve was tested.

Borehole :	TP02
Sample :	B
Depth (m) :	0.60

Tested in accordance with BS 1377 - 2 : 2022

DETERMINATION OF WATER CONTENT / DRY DENSITY RELATIONSHIP

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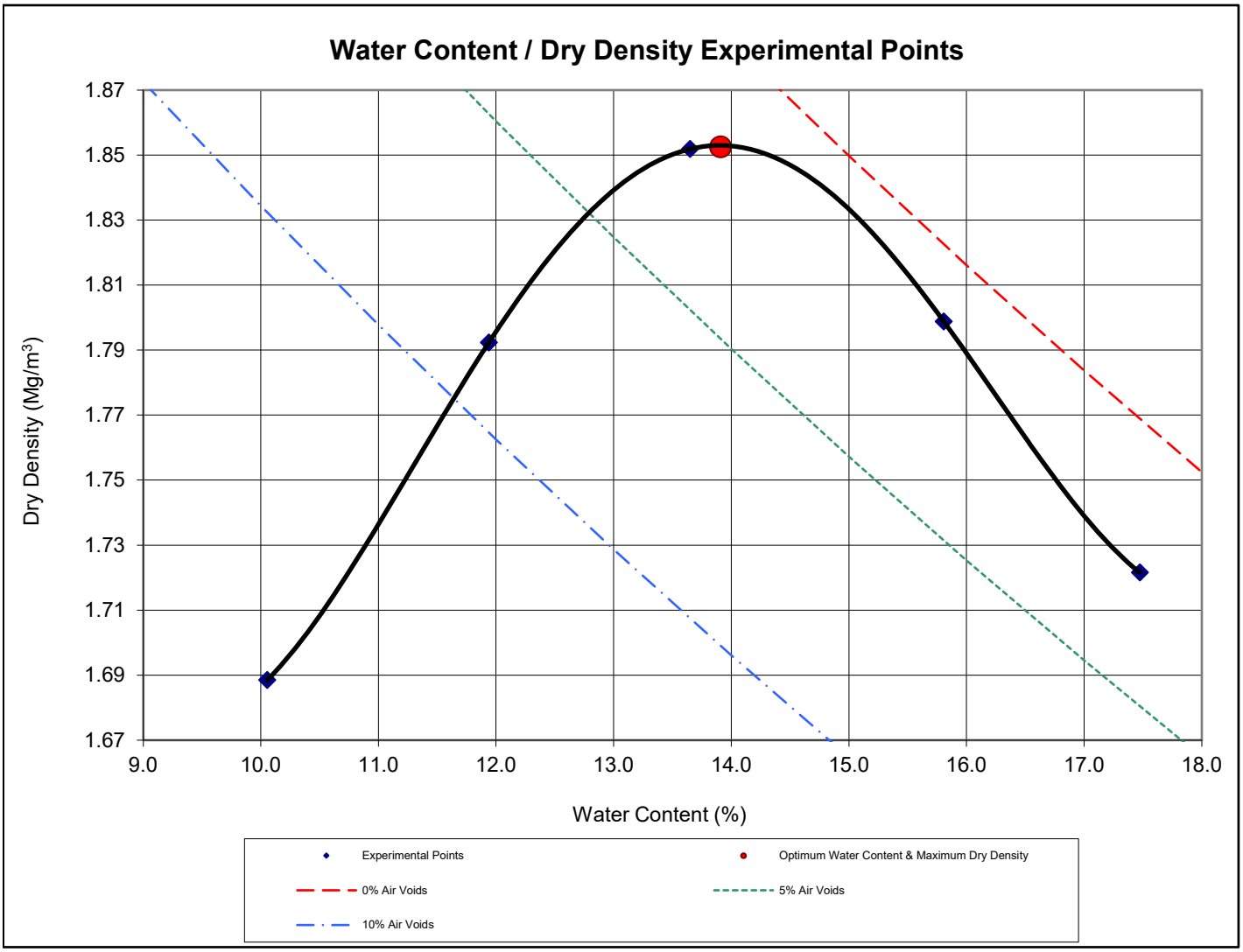


Test Method	:	Clause 11.6: 4.5kg rammer, 5 layers, 62 blows/layer
Preparation Method	:	Separate samples
% Passing 37.5mm	:	78
% Passing 20mm	:	49
Grading Zone	:	x
Particle Density	:	2.56 Mg/m^3 (Measured in accordance with BS 1377 - 2 : 2022 : Clause 9)

Experimental Points	
Water Content (%)	Dry Density (Mg/m^3)
10.1	1.69
11.9	1.79
13.6	1.85
15.8	1.80
17.5	1.72

Optimum Water Content (%)	**Maximum Dry Density (Mg/m^3)**
13.9	**1.85**

Remarks

Materials which contain more than 10% retained on a 37.5mm test sieve and 30% retained on a 20mm test sieve are not suitable for this test (Zone X - BS 1377 - 2 : 2022 : 11, Figure 4). In this instance only material passing the 37.5mm sieve was tested.

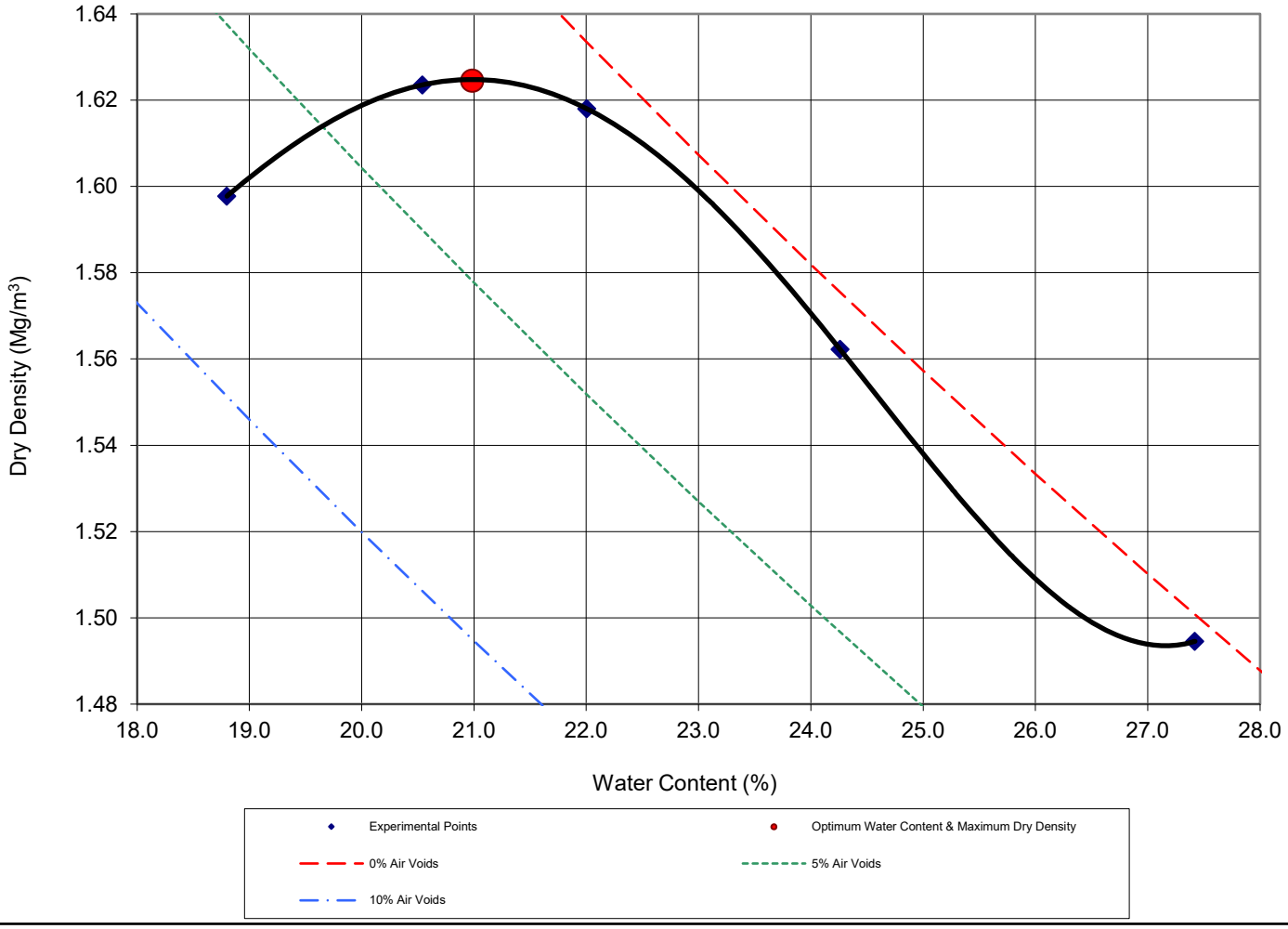
Borehole :	TP04
Sample :	B
Depth (m) :	1.00

Tested in accordance with BS 1377 - 2 : 2022

DETERMINATION OF WATER CONTENT / DRY DENSITY RELATIONSHIP

MATtest Limited
materials testing & consultancy

Water Content / Dry Density Experimental Points



Test Method	:	Clause 11.6: 4.5kg rammer, 5 layers, 62 blows/layer	
Preparation Method	:	Separate samples	
% Passing 37.5mm	:	96	
% Passing 20mm	:	90	
Grading Zone	:	4	
Particle Density	:	2.55	Mg/m^3 (Measured in accordance with BS 1377 - 2 : 2022 : Clause 9)

Experimental Points	
Water Content (%)	Dry Density (Mg/m^3)
18.8	1.60
20.5	1.62
22.0	1.62
24.3	1.56
27.4	1.49

Optimum Water Content (%)	**Maximum Dry Density (Mg/m^3)**
21.0	**1.62**

Remarks

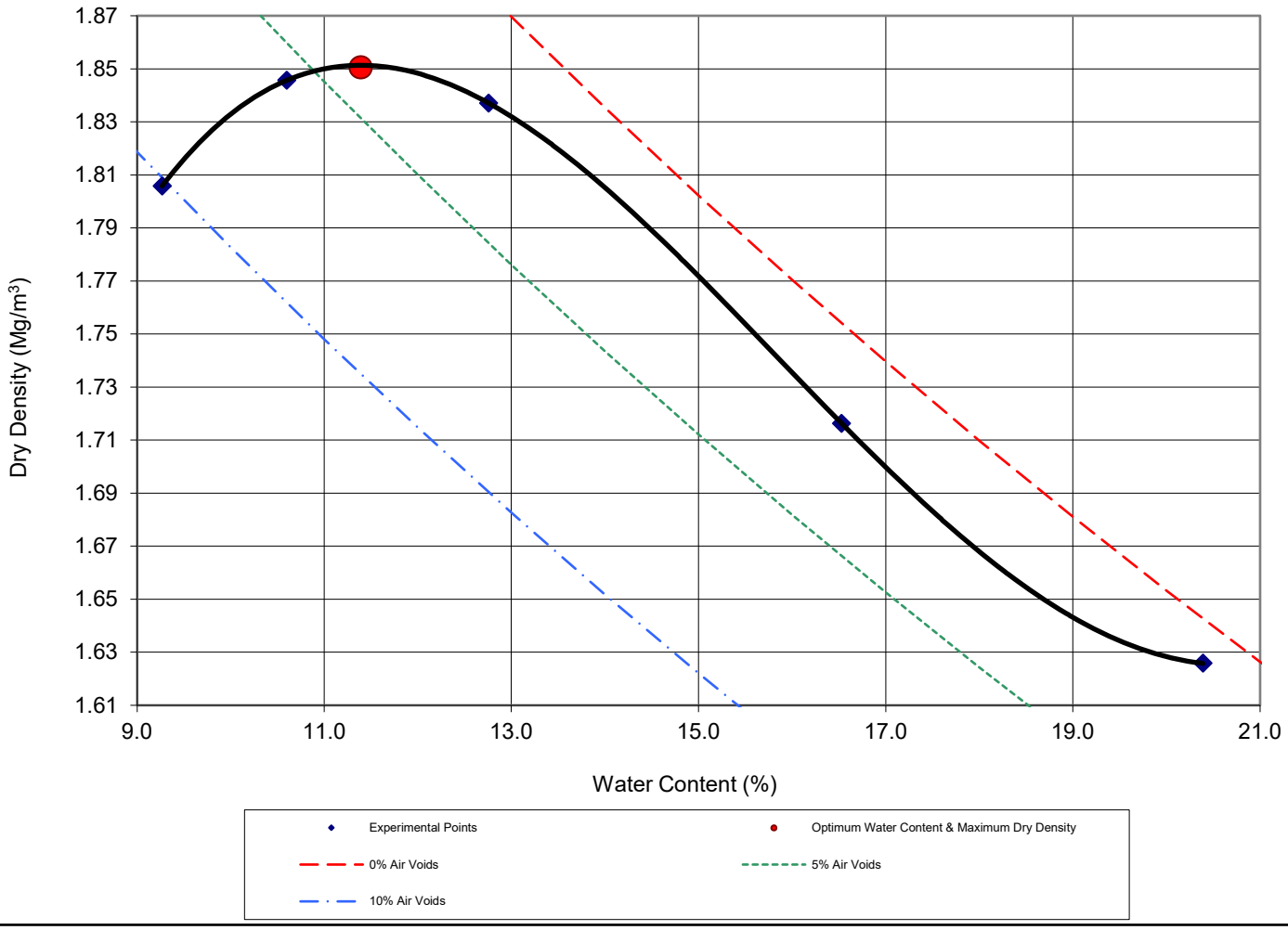
Borehole :	TP09
Sample :	B
Depth (m) :	0.60

Tested in accordance with BS 1377 - 2 : 2022

DETERMINATION OF WATER CONTENT / DRY DENSITY RELATIONSHIP

MATtest Limited
materials testing & consultancy

Water Content / Dry Density Experimental Points



Test Method	:	Clause 11.5: 4.5kg rammer, 5 layers, 27 blows/layer	
Preparation Method	:	Separate samples	
% Passing 37.5mm	:	100	
% Passing 20mm	:	100	
Grading Zone	:	1	
Particle Density	:	2.47	Mg/m^3 (Measured in accordance with BS 1377 - 2 : 2022 : Clause 9)

Experimental Points	
Water Content (%)	Dry Density (Mg/m^3)
9.3	1.81
10.6	1.85
12.8	1.84
16.5	1.72
20.4	1.63

Optimum Water Content (%)	**Maximum Dry Density (Mg/m^3)**
11.4	**1.85**

Remarks

Borehole :	TP12
Sample :	B
Depth (m) :	0.60

Tested in accordance with BS 1377 - 2 : 2022

DETERMINATION OF WATER CONTENT / DRY DENSITY RELATIONSHIP

MATtest Limited
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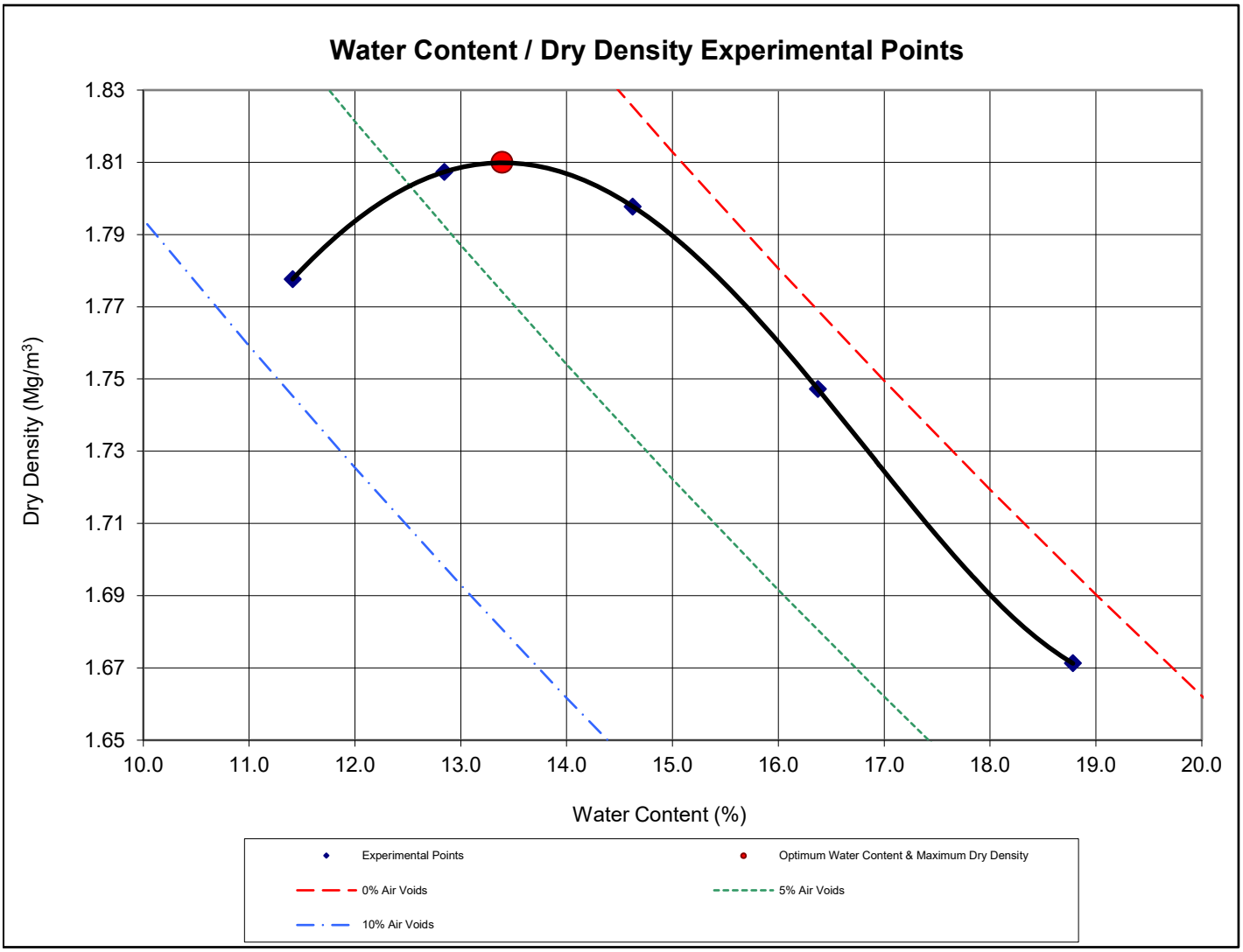


Test Method	:	Clause 11.6: 4.5kg rammer, 5 layers, 62 blows/layer	
Preparation Method	:	Separate samples	
% Passing 37.5mm	:	98	
% Passing 20mm	:	97	
Grading Zone	:	4	
Particle Density	:	2.49	Mg/m^3 (Measured in accordance with BS 1377 - 2 : 2022 : Clause 9)

Experimental Points	
Water Content (%)	Dry Density (Mg/m^3)
11.4	1.78
12.8	1.81
14.6	1.80
16.4	1.75
18.8	1.67

Optimum Water Content (%)	**Maximum Dry Density (Mg/m^3)**
13.4	**1.81**

Remarks

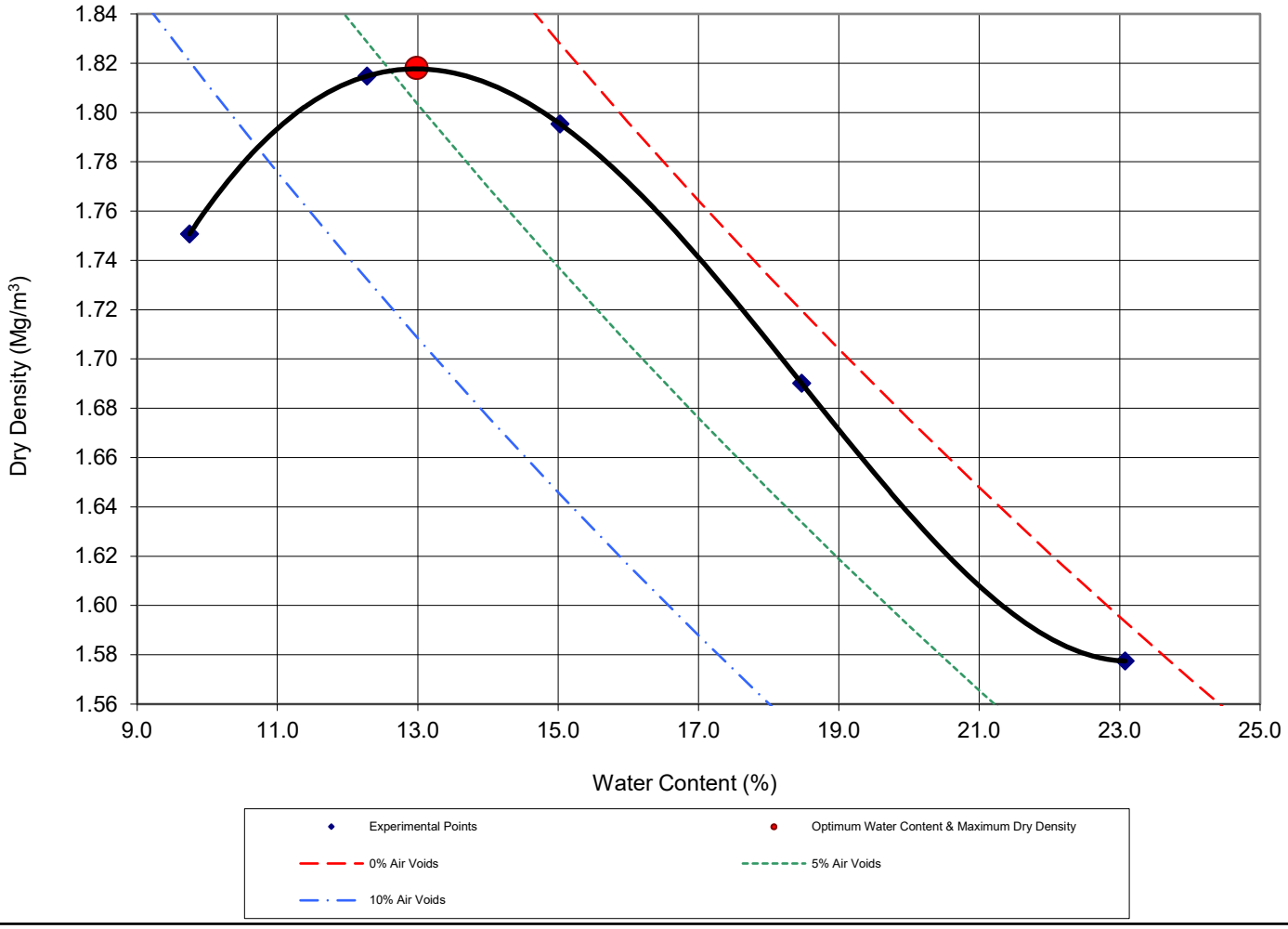
Borehole :	TP14
Sample :	B
Depth (m) :	0.60

Tested in accordance with BS 1377 - 2 : 2022

DETERMINATION OF WATER CONTENT / DRY DENSITY RELATIONSHIP

MATtest Limited
materials testing & consultancy

Water Content / Dry Density Experimental Points



Test Method	:	Clause 11.5: 4.5kg rammer, 5 layers, 27 blows/layer	
Preparation Method	:	Separate samples	
% Passing 37.5mm	:	100	
% Passing 20mm	:	99	
Grading Zone	:	2	
Particle Density	:	2.52	Mg/m^3 (Measured in accordance with BS 1377 - 2 : 2022 : Clause 9)

Experimental Points	
Water Content (%)	Dry Density (Mg/m^3)
9.7	1.75
12.3	1.81
15.0	1.80
18.5	1.69
23.1	1.58

Optimum Water Content (%)	**Maximum Dry Density (Mg/m^3)**
13.0	**1.82**

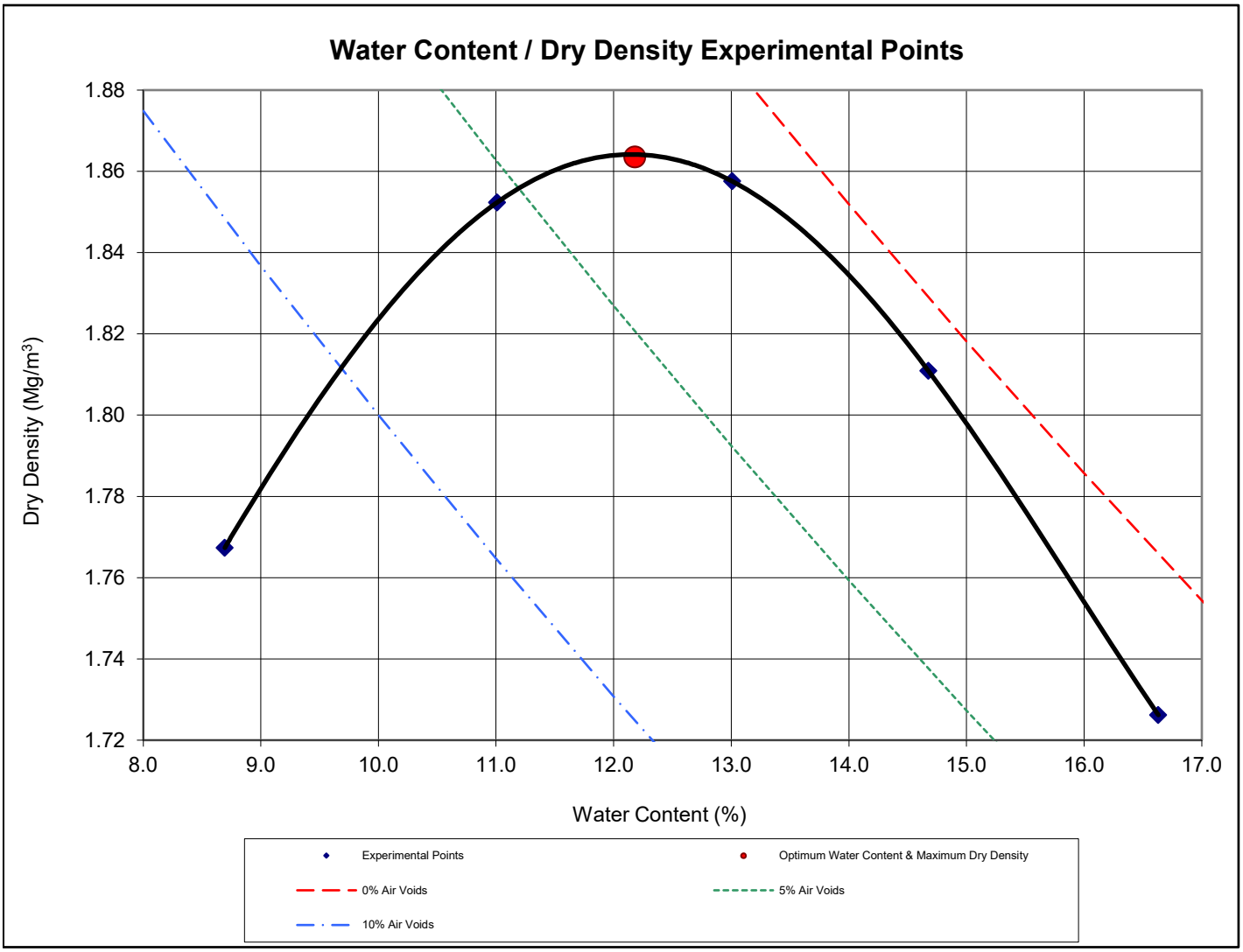
Remarks

Borehole :	TP19
Sample :	B
Depth (m) :	0.60

Tested in accordance with BS 1377 - 2 : 2022

DETERMINATION OF WATER CONTENT / DRY DENSITY RELATIONSHIP

MATtest Limited
materials testing & consultancy



Test Method	:	Clause 11.6: 4.5kg rammer, 5 layers, 62 blows/layer	
Preparation Method	:	Separate samples	
% Passing 37.5mm	:	83	
% Passing 20mm	:	59	
Grading Zone	:	x	
Particle Density	:	2.50	Mg/m^3 (Measured in accordance with BS 1377 - 2 : 2022 : Clause 9)

Experimental Points	
Water Content (%)	Dry Density (Mg/m^3)
8.7	1.77
11.0	1.85
13.0	1.86
14.7	1.81
16.6	1.73

Optimum Water Content (%)	**Maximum Dry Density (Mg/m^3)**
12.2	**1.86**

Remarks

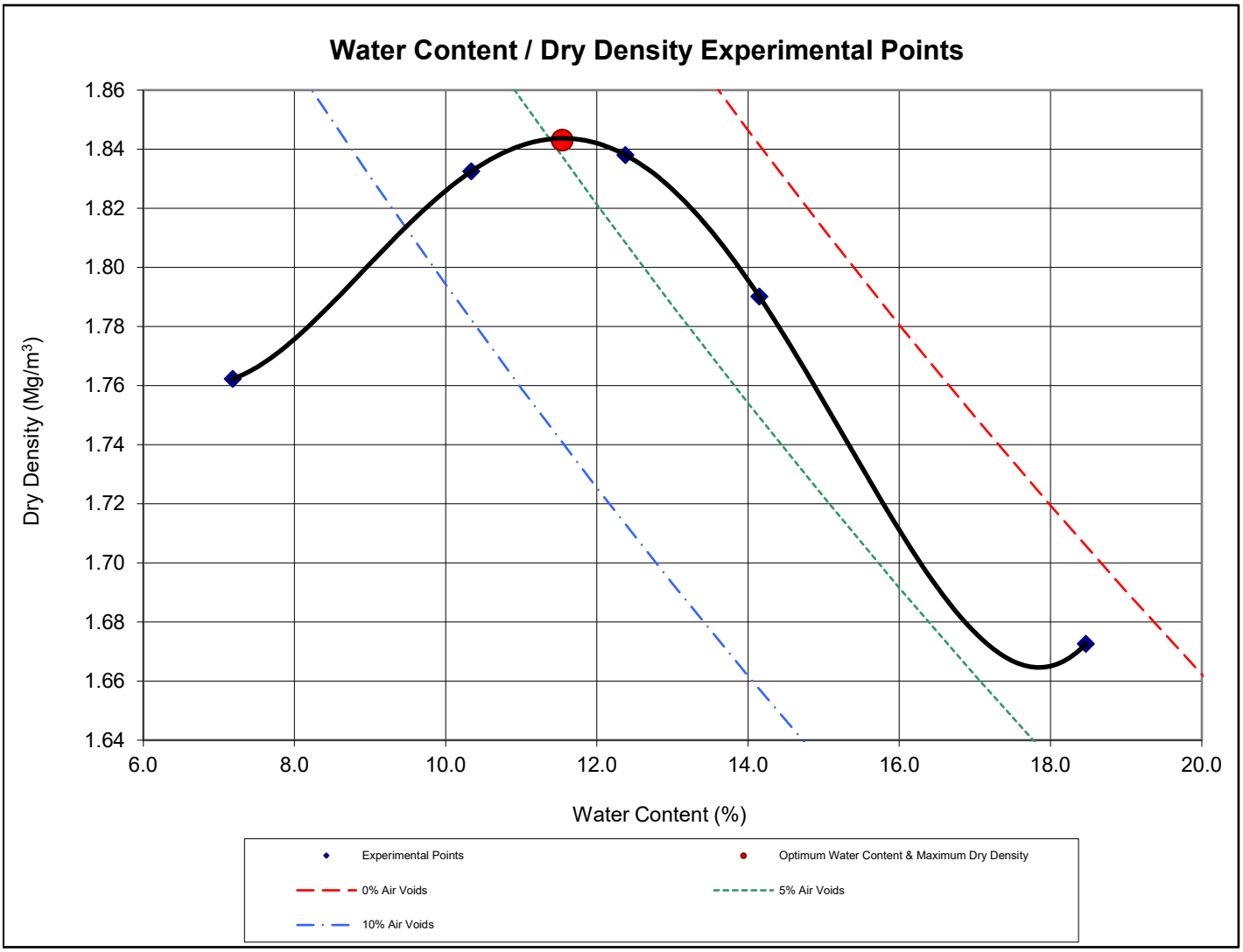
Materials which contain more than 10% retained on a 37.5mm test sieve and 30% retained on a 20mm test sieve are not suitable for this test (Zone X - BS 1377 - 2 : 2022 : 11, Figure 4). In this instance only material passing the 37.5mm sieve was tested.

Borehole :	TP27
Sample :	B
Depth (m) :	1.00

Tested in accordance with BS 1377 - 2 : 2022

DETERMINATION OF WATER CONTENT / DRY DENSITY RELATIONSHIP

MATtest Limited
materials testing & consultancy



Test Method	:	Clause 11.6: 4.5kg rammer, 5 layers, 62 blows/layer	
Preparation Method	:	Separate samples	
% Passing 37.5mm	:	92	
% Passing 20mm	:	82	
Grading Zone	:	5	
Particle Density	:	2.49	Mg/m^3 (Measured in accordance with BS 1377 - 2 : 2022 : Clause 9)

Experimental Points	
Water Content (%)	Dry Density (Mg/m^3)
7.2	1.76
10.3	1.83
12.4	1.84
14.1	1.79
18.5	1.67

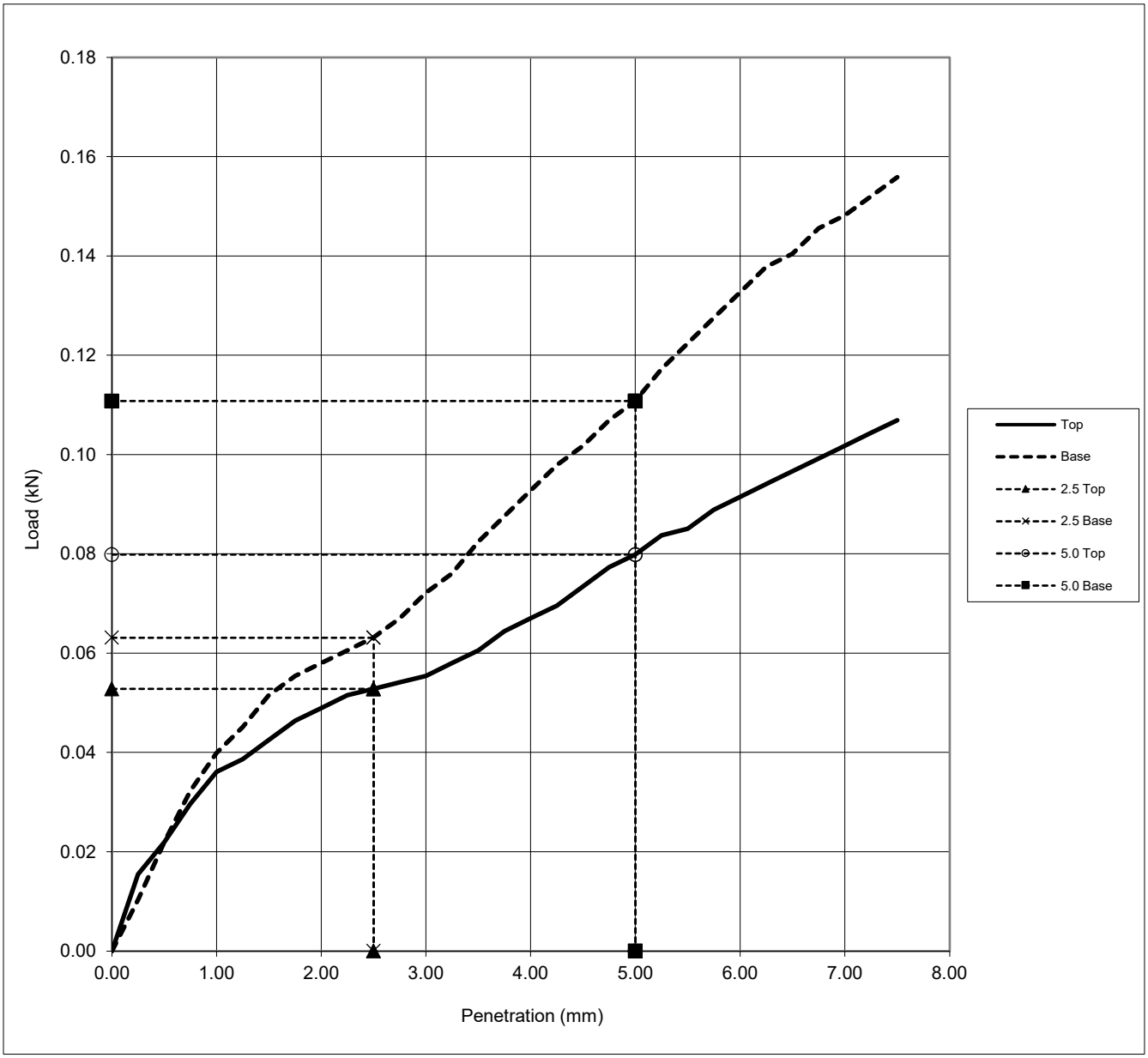
Optimum Water Content (%)	**Maximum Dry Density (Mg/m^3)**
11.5	**1.84**

Remarks

Borehole :	BH04
Sample :	B
Depth (m) :	1.00

Tested in accordance with BS 1377 - 2 : 2022

DETERMINATION OF WATER CONTENT / DRY DENSITY RELATIONSHIP

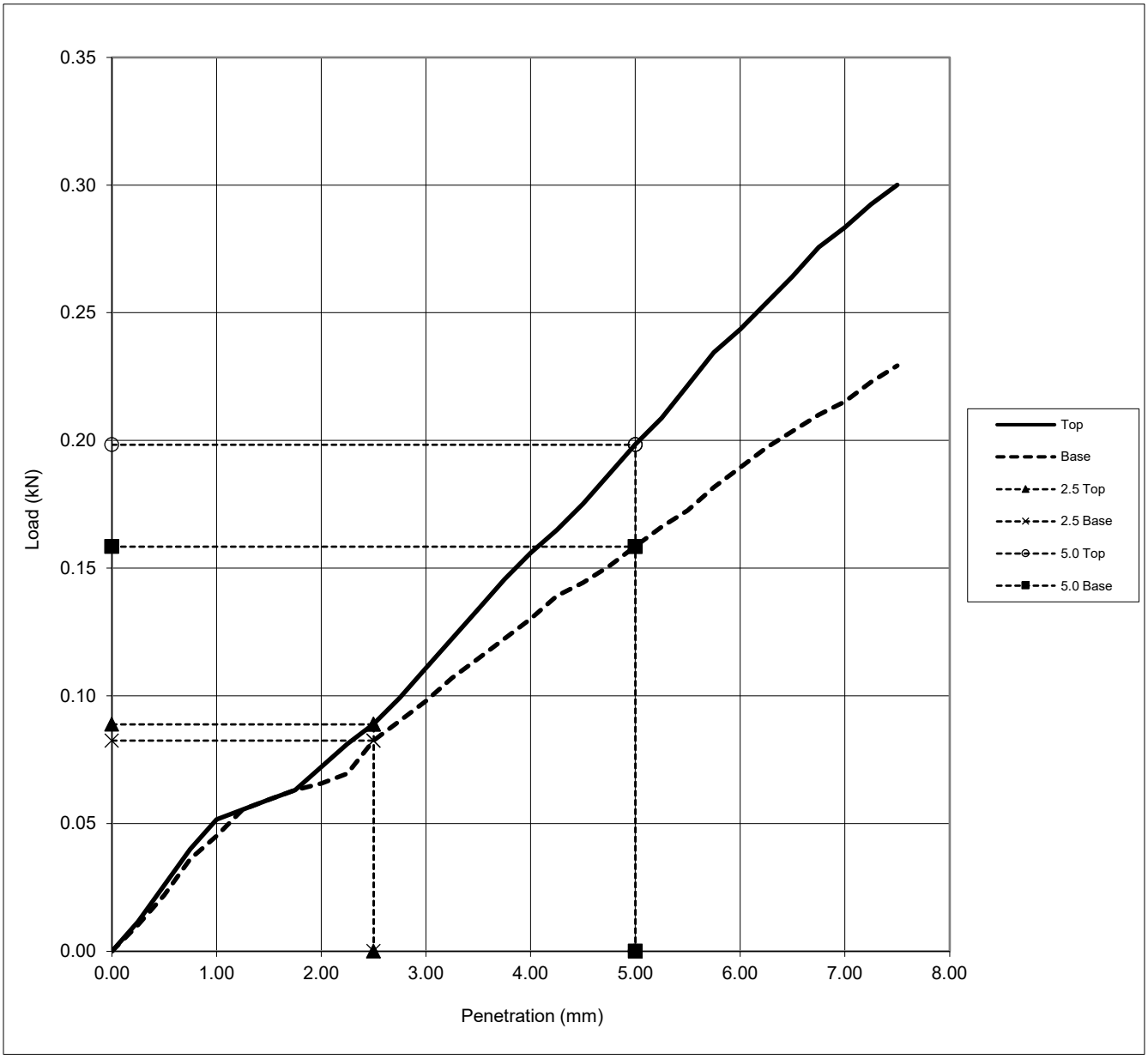


Water Content	23.3	%		Top	Base				
Bulk Density	1.98	Mg/m^3	Water Content	23.6	23.0	%	**Borehole**	**TP01**	
Dry Density	1.60	Mg/m^3	CBR (%) at 2.5mm	0.4	0.5	%	**Sample**	**B**	
Compactive Effort	2.5kg Rammer		CBR (%) at 5.0mm	0.4	0.6	%	**Depth (m)**	**0.60**	
Surcharge Used	-	kg	Curve Corrected	No			**Lime Added (%)**	**-**	
Soaking Period	-	days	Test Condition	Unsoaked			**Cement Added (%)**	**-**	
Amount of swell	-	mm	Material Removed	3		%	**Accepted CBR (%)**	**0.6**	

Remarks;

DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

Tested in accordance with BS 1377 - 2 : 2022 : Clause 15

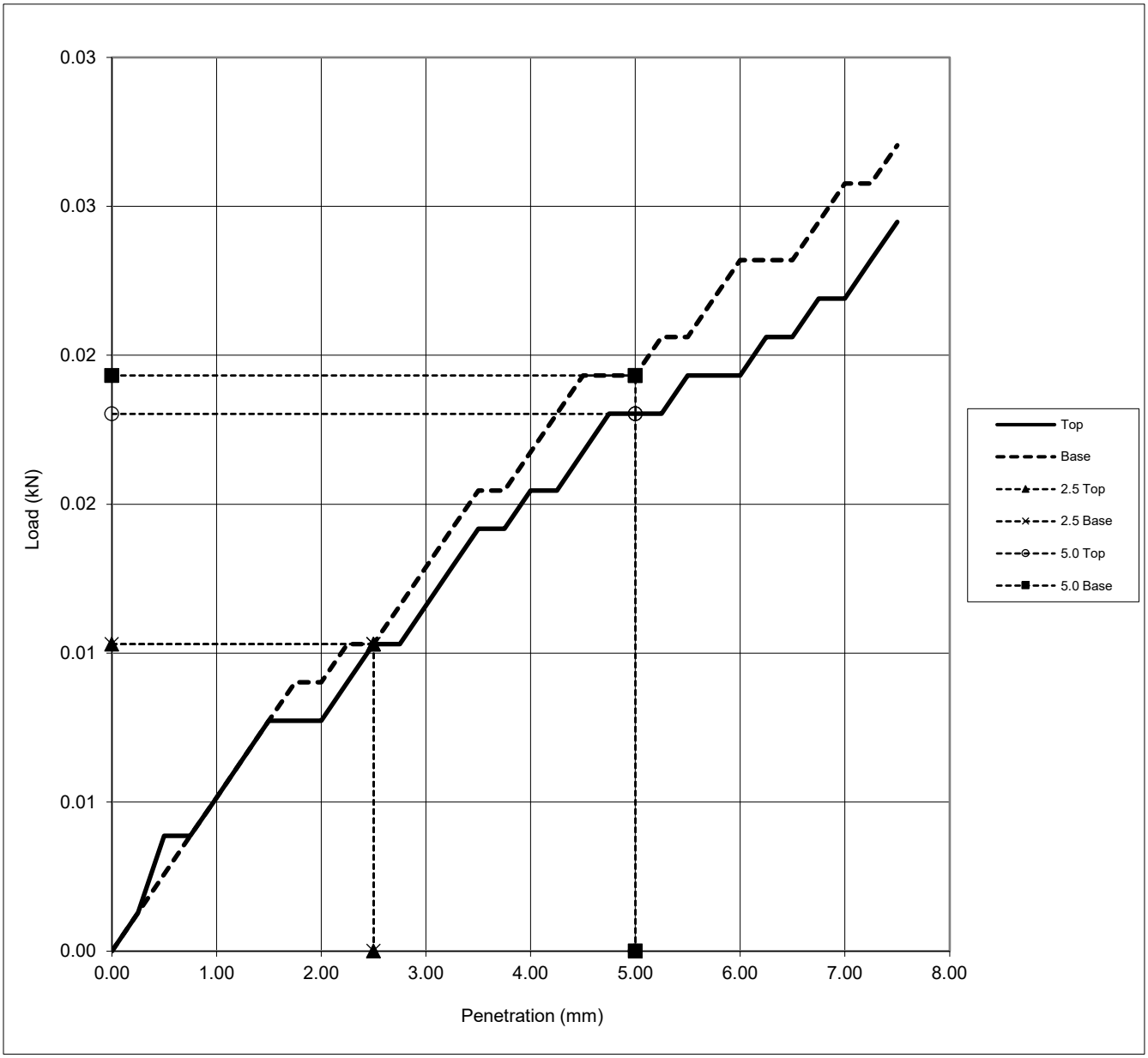


Water Content	22.3	%		Top	Base				
Bulk Density	2.00	Mg/m^3	Water Content	22.1	22.5	%	**Borehole**	**TP07**	
Dry Density	1.63	Mg/m^3	CBR (%) at 2.5mm	0.7	0.6	%	**Sample**	**B**	
Compactive Effort	2.5kg Rammer		CBR (%) at 5.0mm	1.0	0.8	%	**Depth (m)**	**1.00**	
Surcharge Used	-	kg	Curve Corrected	No			**Lime Added (%)**	**-**	
Soaking Period	-	days	Test Condition	Unsoaked			**Cement Added (%)**	**-**	
Amount of swell	-	mm	Material Removed	1		%	**Accepted CBR (%)**	**1.0**	

Remarks;

DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

Tested in accordance with BS 1377 - 2 : 2022 : Clause 15

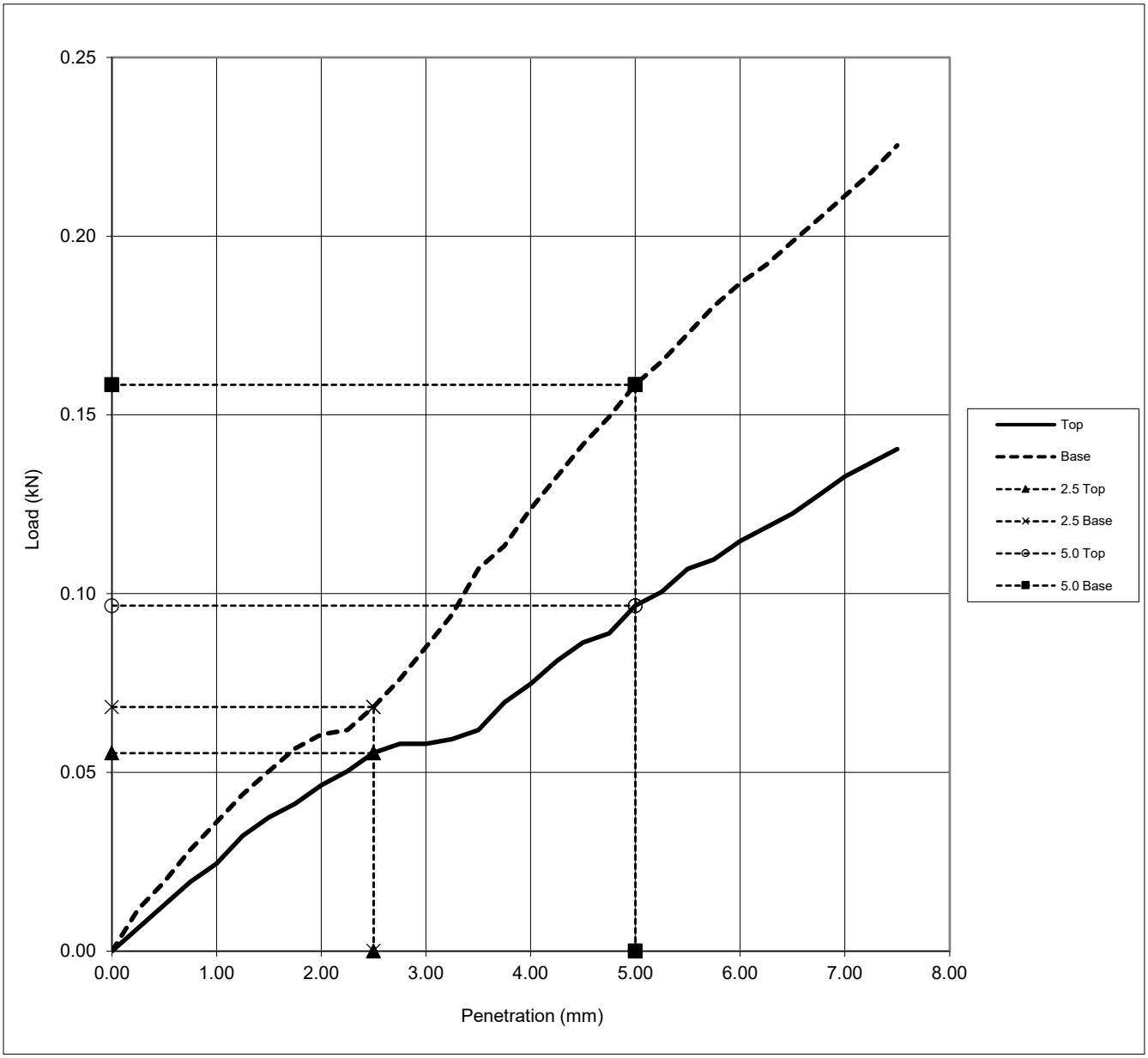


				Top	Base			
Water Content	63.9	%						
Bulk Density	1.48	Mg/m^3	Water Content	62.6	65.2	%	**Borehole**	**TP17**
Dry Density	0.90	Mg/m^3	CBR (%) at 2.5mm	0.1	0.1	%	**Sample**	**B**
Compactive Effort	2.5kg Rammer		CBR (%) at 5.0mm	0.1	0.1	%	**Depth (m)**	**0.25**
Surcharge Used	-	kg	Curve Corrected	No			**Lime Added (%)**	**-**
Soaking Period	-	days	Test Condition	Unsoaked			**Cement Added (%)**	**-**
Amount of swell	-	mm	Material Removed	2		%	**Accepted CBR (%)**	**0.1**

Remarks;

DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

Tested in accordance with BS 1377 - 2 : 2022 : Clause 15

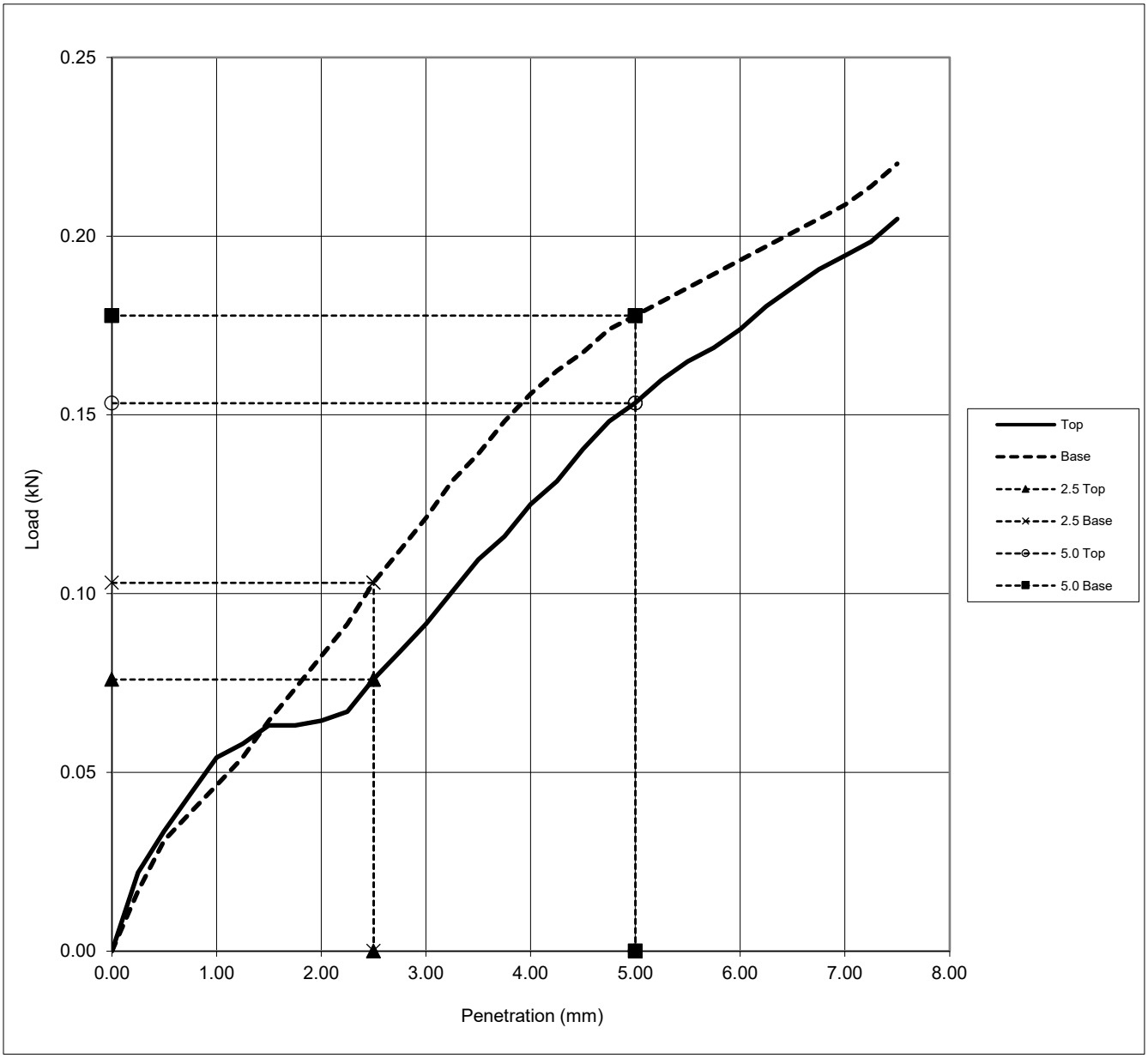


				Top	Base			
Water Content	22.4	%						
Bulk Density	1.96	Mg/m^3	Water Content	22.1	22.8	%	**Borehole**	**TP19**
Dry Density	1.60	Mg/m^3	CBR (%) at 2.5mm	0.4	0.5	%	**Sample**	**B**
Compactive Effort	2.5kg Rammer		CBR (%) at 5.0mm	0.5	0.8	%	**Depth (m)**	**0.60**
Surcharge Used	-	kg	Curve Corrected	No			**Lime Added (%)**	**-**
Soaking Period	-	days	Test Condition	Unsoaked			**Cement Added (%)**	**-**
Amount of swell	-	mm	Material Removed	1		%	**Accepted CBR (%)**	**0.8**

Remarks;

DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

Tested in accordance with BS 1377 - 2 : 2022 : Clause 15



				Top	Base			
Water Content	25.4	%						
Bulk Density	1.94	Mg/m^3	Water Content	25.3	25.4	%	**Borehole**	**TP25**
Dry Density	1.55	Mg/m^3	CBR (%) at 2.5mm	0.6	0.8	%	**Sample**	**B**
Compactive Effort	2.5kg	Rammer	CBR (%) at 5.0mm	0.8	0.9	%	**Depth (m)**	**0.90**
Surcharge Used	-	kg	Curve Corrected	No			**Lime Added (%)**	**-**
Soaking Period	-	days	Test Condition	Unsoaked			**Cement Added (%)**	**-**
Amount of swell	-	mm	Material Removed	0		%	**Accepted CBR (%)**	**0.9**

Remarks;

DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

Tested in accordance with BS 1377 - 2 : 2022 : Clause 15

Curtins Ltd
1a Belford Mews, Edinburgh
Tel: 0121 643 4694

CALCULATION SHEET - SOIL INFILTRATION RATE

Project:	Rigifa Thurso
Job Number:	085449
Author:	MTL

Hole Ref.:	SA01
Test Date:	29/02/2024
Test No.:	1 of 1

1.10	m	Length of trial pit
0.40	m	Width of trial pit
1.10	m	Depth (total) of trial pit
0.44	m^2	Area of trial pit base
0.04	m bgl	Water level at start of test (approximate invert level)
0.20	m bgl	Water level at end of test
0.16	m	Effective storage depth
0.08	m bgl	Effective storage depth (75% full)
0.16	m bgl	Effective storage depth (25% full)
0.035	**m^3**	**Effective storage volume (V_{75-25})**
0.680	**m^2**	**Internal surface area (50% effective depth) (a_{50})**
3420	**s**	**Time for head to fall from 75% to 25% effective depth (t_{75-25})**

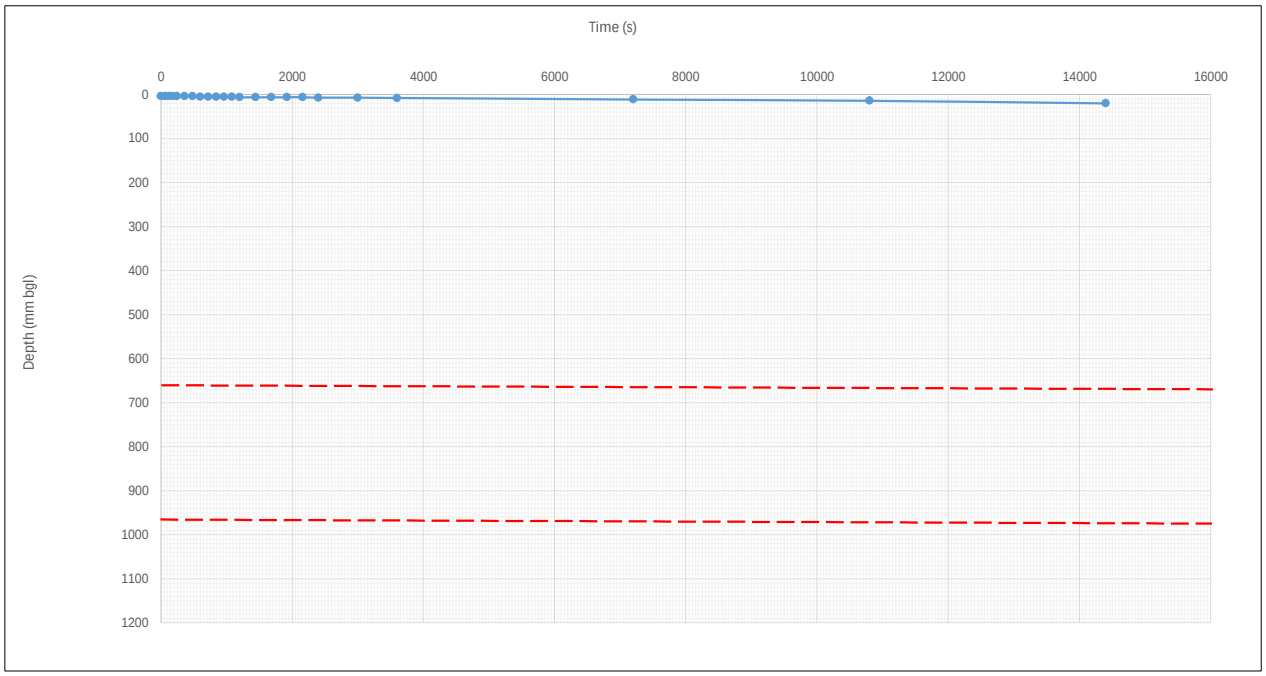
1.51E-05 m/s	**Soil infiltration rate (f)**

RAW DATA

Project:	Rigifa Thurso
Job Number:	085449
Author:	MTL

Hole Ref.:	SA01
Test Date:	29/02/2024
Test No.:	1 of 1

Time (min)	Time (s)	Depth (mm bgl)	Stratum
0	0	4	**Firm Brown very gravelly sandy silty CLAY**/FLAGSTONE
1	60	4	
2	120	4	
3	180	4	
4	240	4	
6	360	4	
8	480	4	
10	600	5	
12	720	5	
14	840	5	
16	960	5	
18	1080	5	
20	1200	6	
24	1440	6	
28	1680	6	
32	1920	6	
36	2160	6	
40	2400	7	
50	3000	7	
60	3600	8	
120	7200	11	
180	10800	14	
240	14400	20	



Note 1: Pit backfilled with arisings.

Curtins Ltd
1a Belford Mews, Edinburgh
Tel: 0121 643 4694

CALCULATION SHEET - SOIL INFILTRATION RATE

Project:	Rigifa Thurso
Job Number:	085449
Author:	MTL

Hole Ref.:	SA02
Test Date:	29/02/2024
Test No.:	1 of 1

1.30	m	Length of trial pit
0.40	m	Width of trial pit
1.25	m	Depth (total) of trial pit
0.52	m^2	Area of trial pit base
0.07	m bgl	Water level at start of test (approximate invert level)
0.00	m bgl	Water level at end of test
-0.07	m	Effective storage depth
0.05	m bgl	Effective storage depth (75% full)
0.02	m bgl	Effective storage depth (25% full)
-0.018	**m^3**	**Effective storage volume (V_{75-25})**
0.401	**m^2**	**Internal surface area (50% effective depth) (a_{50})**
3420	**s**	**Time for head to fall from 75% to 25% effective depth (t_{75-25})**

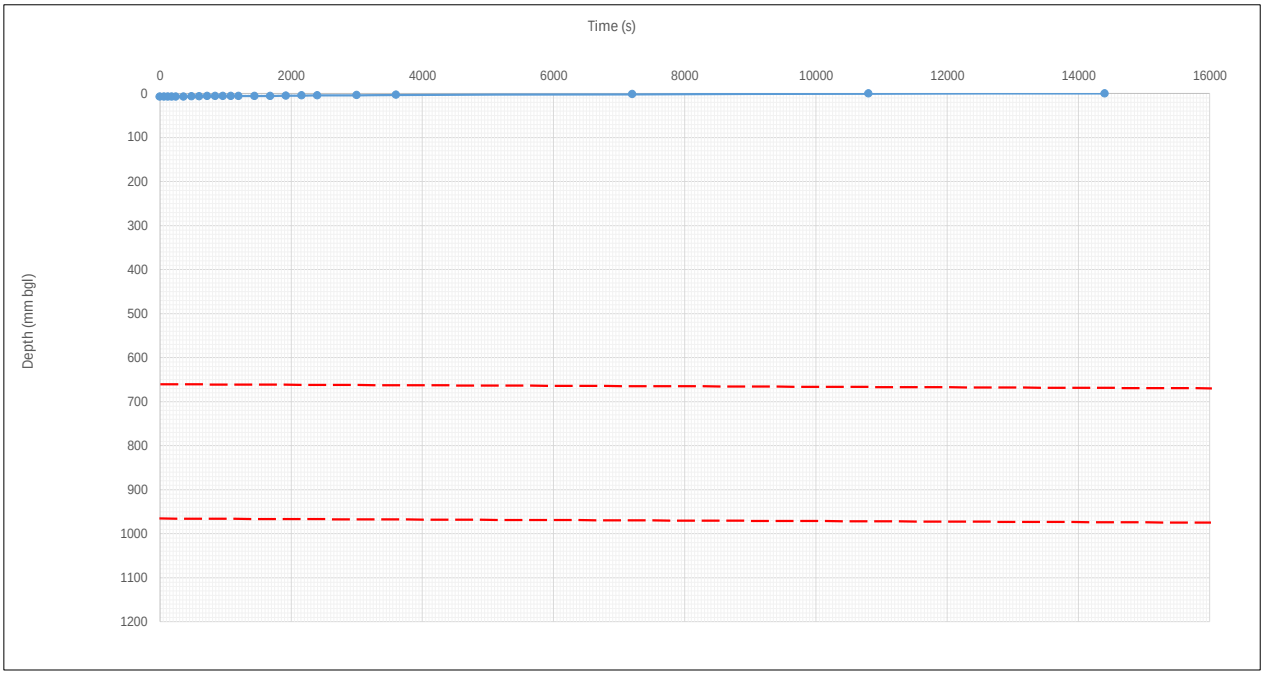
-1.33E-05 m/s	**Soil infiltration rate (f)**

RAW DATA

Project:	Rigifa Thurso
Job Number:	085449
Author:	MTL

Hole Ref.:	SA02
Test Date:	29/02/2024
Test No.:	1 of 1

Time (min)	Time (s)	Depth (mm bgl)	Stratum
0	0	7	**Firm Brown very gravelly sandy silty CLAY**/FLAGSTONE
1	60	7.4	
2	120	7.3	
3	180	7.3	
4	240	7.2	
6	360	7.1	
8	480	6.8	
10	600	6.6	
12	720	6.2	
14	840	6.1	
16	960	6.1	
18	1080	5.9	
20	1200	5.6	
24	1440	5.5	
28	1680	5.5	
32	1920	4.9	
36	2160	4.7	
40	2400	4.1	
50	3000	3.8	
60	3600	3.3	
120	7200	1.6	
180	10800	0.1	
240	14400	0	



Note 1: Pit backfilled with arisings.

CBR Data Interpretation

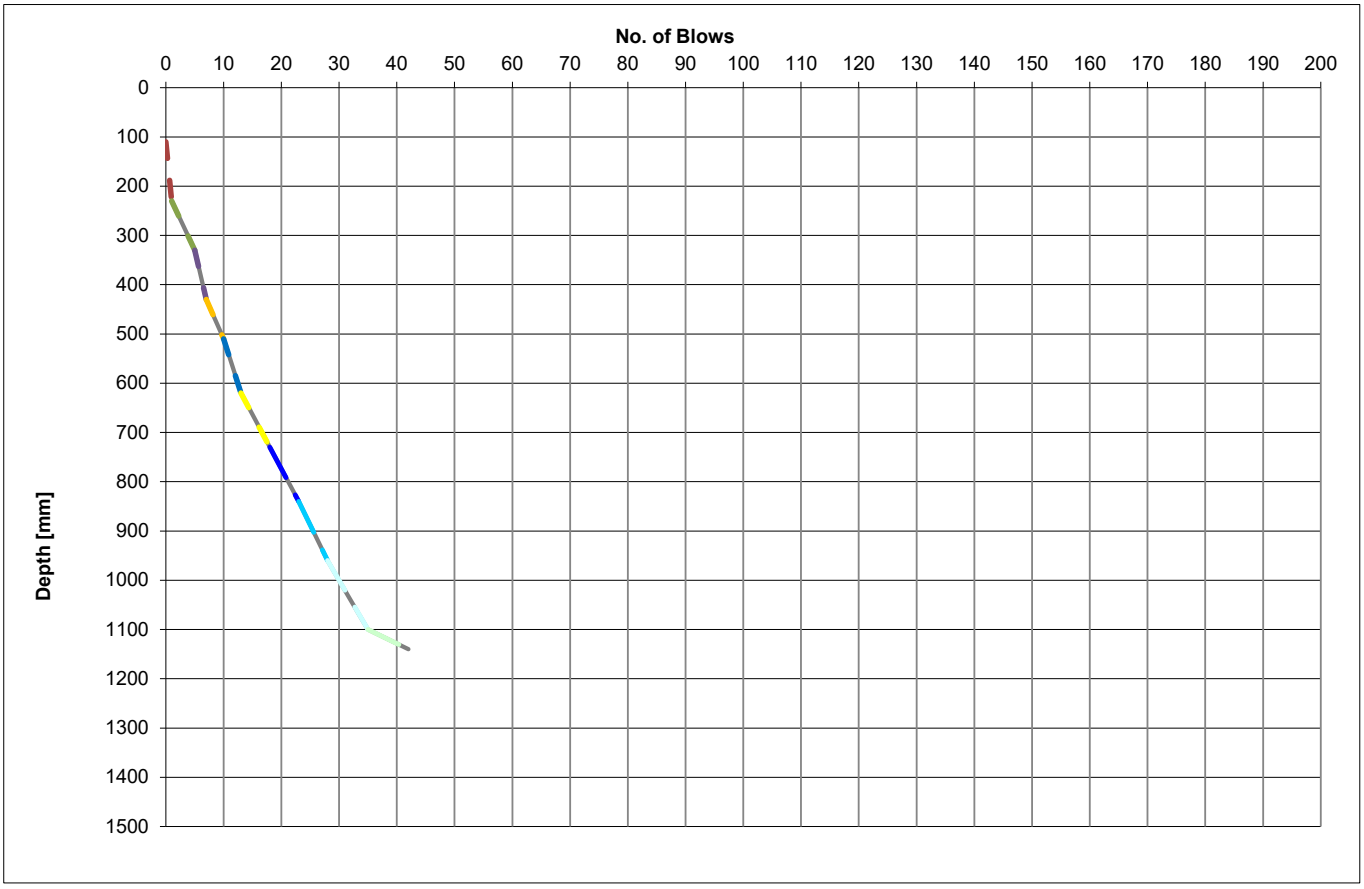
Method: CS 229- Data for pavement assessment Section 6 (Mar 2020)

Formula: Log10(CBR)=2.48 - 1.057 Log10(mm/blow)

Location CBR 01 - Rigifa

Coordinates E: 329309.283 N: 971254.353 Level (m AOD): 59.781

Date 21/02/2024



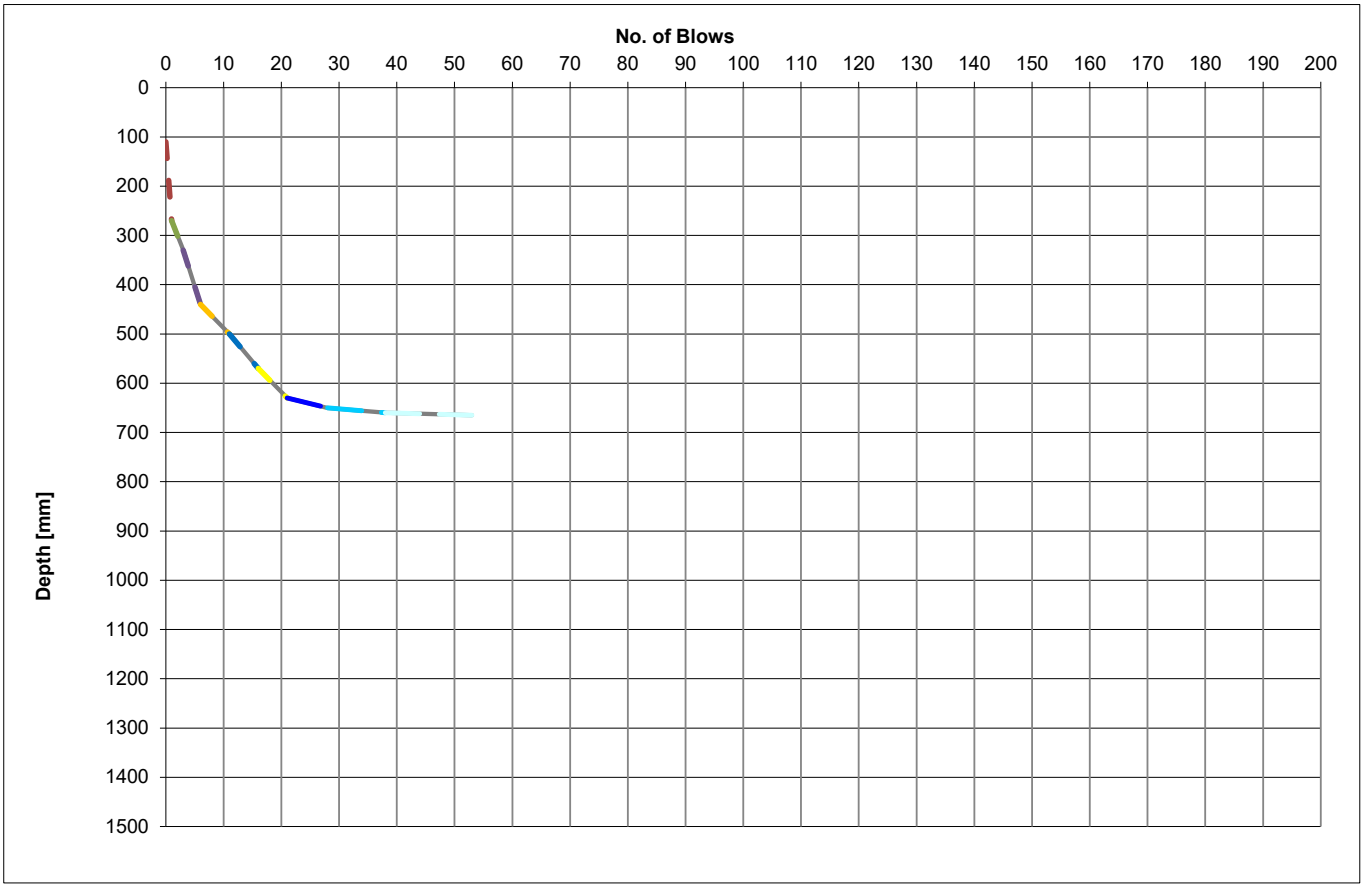
CBR RESULTS

TEST	Depth m		CBR Value
No	From	To	%
CBR 01	0.11	0.23	1.9
CBR 01	0.23	0.33	10.1
CBR 01	0.33	0.43	4.8
CBR 01	0.43	0.51	9.4
CBR 01	0.51	0.62	6.7
CBR 01	0.62	0.73	11.5
CBR 01	0.73	0.84	11.5
CBR 01	0.84	0.96	10.5
CBR 01	0.96	1.10	12.7
CBR 01	1.10	1.14	47.9

CBR Data Interpretation

Drilling Ltd

Method:	CS 229- Data for pavement assessment Section 6 (Mar 2020)			
Formula:	Log10(CBR)=2.48 - 1.057 Log10(mm/blow)			
Location	CBR 02 - Rigifa			
Coordinates	E: 329467.548	N: 971091.716	Level (m AOD):	72.178
Date	21/02/2024			



CBR RESULTS

TEST	Depth m		CBR Value
No	From	To	%
CBR 02	0.11	0.27	1.4
CBR 02	0.27	0.33	8.3
CBR 02	0.33	0.44	6.7
CBR 02	0.44	0.50	21.8
CBR 02	0.50	0.57	18.6
CBR 02	0.57	0.63	21.8
CBR 02	0.63	0.65	99.6
CBR 02	0.65	0.66	302.0
CBR 02	0.66	0.67	964.5

Curtins
Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
Tel: 0161 236 2394
Fax: 0161 228 7902

GAS MONITORING LOG SHEET

Project:	Rigifa	**Date:**	13/03/2024
Job Number:	####	**Visit:**	1
Client:	Field.Energy	**Weather:**	Weather
Barometric State:	Stable	**Ground Conditions:**	Dry

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
BH01	1002	0.0	0.0	0.0	0.0	0.1	0.1	20.5	0	0	DRY	1.00	
BH02	1002	0.0	0.0	0.0	0.0	0.1	0.1	20.2	0	0	DRY	1.85	
BH03	1002	0.0	0.0	0.0	0.0	0.1	0.1	20.4	0	0	DRY	1.90	
BH04	1002	0.0	0.0	0.0	0.0	0.1	0.1	20.6	0	0	DRY	1.18	
BH05	1002	0.0	0.0	0.0	0.0	0.1	0.1	20.8	0	0	DRY	1.99	
BH06	1002	0.0	0.0	0.0	0.0	0.1	0.1	21.1	0	0	DRY	1.80	
BH07	1002	0.0	0.0	0.0	0.0	0.1	0.1	20.6	0	0	DRY	1.55	

Notes

Logged by

1% gas volume = 10,000 ppm
Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.
All other gases recorded at 'steady state' unless otherwise stated

Curtins
Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
Tel: 0161 236 2394
Fax: 0161 228 7902

GAS MONITORING LOG SHEET

Project:	Rigifa	**Date:**	27/03/2024
Job Number:	####	**Visit:**	2
Client:	Field.Energy	**Weather:**	Wet
Barometric State:	Stable	**Ground Conditions:**	Wet

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
BH01	988	0.0	0.0	0.0	0.0	0.1	0.1	20.30	0	0	DRY	1.00	
BH02	988	0.0	0.0	0.0	0.0	0.1	0.1	20.50	0	0	DRY	1.85	
BH03	988	0.0	0.0	0.0	0.0	0.1	0.1	20.20	0	0	DRY	1.90	
BH04	988	0.0	0.0	0.0	0.0	0.1	0.1	20.40	0	0	DRY	1.18	
BH05	988	0.0	0.0	0.0	0.0	0.1	0.1	20.90	0	0	DRY	1.99	
BH06	988	0.0	0.0	0.0	0.0	0.1	0.1	21.1	0	0	DRY	1.80	
BH07	988	0.0	0.0	0.0	0.0	0.1	0.1	20.4	0	0	DRY	1.55	
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Notes

Logged by

1% gas volume = 10,000 ppm
Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.
All other gases recorded at 'steady state' unless otherwise stated

Curtins
Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
Tel: 0161 236 2394
Fax: 0161 228 7902

GAS MONITORING LOG SHEET

Project:	Rigifa	**Date:**	09/04/2024
Job Number:	####	**Visit:**	3
Client:	Field.Energy	**Weather:**	Wet
Barometric State:	Steady	**Ground Conditions:**	Wet

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
BH01	1010	0.0	0.0	0.0	0.0	0.1	0.1	20.8	0	0	DRY	1.00	
BH02	1010	0.0	0.0	0.0	0.0	0.1	0.1	20.9	0	0	DRY	1.85	
BH03	1010	0.0	0.0	0.0	0.0	0.1	0.1	20.5	0	0	DRY	1.90	
BH04	1010	0.0	0.0	0.0	0.0	0.1	0.1	20.8	0	0	DRY	1.18	
BH05	1010	0.0	0.0	0.0	0.0	0.1	0.1	21.0	0	0	DRY	1.99	
BH06	1010	0.0	0.0	0.0	0.0	0.1	0.1	21.1	0	0	DRY	1.80	
BH07	1010	0.0	0.0	0.0	0.0	0.1	0.1	20.6	0	0	DRY	1.55	
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Notes

Logged by

1% gas volume = 10,000 ppm
Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.
All other gases recorded at 'steady state' unless otherwise stated

Adopted Soil Generic Assessment Criteria
Sandy loam with 1% SOM

curtins

Contaminants	Residential with home grown produce	Residential without home grown produce	Allotments	Commercial	Public open space near residential housing POS_{resi}	Public park POS_{park}
Metals						
Beryllium	*1.7*	*1.7*	*35*	*12*	*2.2*	*63*
Boron	*290*	*11,000*	*45*	*240,000*	*21,000*	*46,000*
Cadmium	**10**[13] 22	**85**[13] 150	**1.8** 3.9	**230** 410	*120* 220	*560* 880
Chromium III	*910*	*910*	*18,000*	*8,600*	*1,500*	*33,000*
Chromium VI	*6* 21	*6* 21	*1.8* 170	*33* 49	*7.7* 21	*220* 250
Lead	200	310	80	2,300	630	1,300
Mercury *(elemental)*	**1**	**1**	**26**	**26**	*16*	**26**[8] *[30]*
Mercury (inorganic)	**170**	**240**	**80**	**3600**	*120*	*240*
Nickel	*130*[10]	*180*[10]	*53*[11]	*980*[10]	*230*	*800*
Vanadium	*410*	*1200*	*91*	*9000*	*2000*	*5000*
Copper	*2400*	*7100*	*520*	*68000*	*12000*	*44000*
Zinc	*3700*	*40000*	*620*	*730000*	*81000*	*170000*
Semi-Metals and non-metals						
Arsenic	**32**[12] 37	**35**[12] 40	**43**[12] 49	**640**[12] 640	*79* 79	*170* 170
Antimony		***550***		***7500***	***1500***	***3300***
Selenium	**350**	**600**	**120**	**13000**	*1100*	*1800*
Inorganic chemicals						
Cyanide	34	34	34	34	34	34
Organic contaminants						
Aliphatic risk banded hydrocarbons - TPHCWG method						
$EC_{>5}$ - EC_6	*42*	*42*	*730*	*3200*	*570000*	*95000*
$EC_{>6}$ - EC_8	*100*	*100*	*2300*	*7800*	*600000*	*150000*
$EC_{>8}$ - EC_{10}	*27*	*27*	*320*	*2000*	*13000*	*14000*
EC_{10}-EC_{12}	*130*	*130*	*2200*	*9700*	*13000*	*21000*
EC_{12}-EC_{16}	*1100*	*1100*	*11000*	*59000*	*13000*	*25000*
$EC_{>16}$ - EC_{35}	*65000*	*65000*	*260000*	*1600000*	*250000*	*450000*
$EC_{>35}$ - EC_{44}	*65000*	*65000*	*260000*	*1600000*	*250000*	*450000*
Aromatic risk banded hydrocarbons - TPHCWG method						
$EC_{>5}$ - EC_7	*70*	*370*	*13*	*26000*	*56000*	*76000*
$EC_{>7}$ - EC_8	*130*	*860*	*22*	*56000*	*56000*	*87000*
$EC_{>8}$ - EC_{10}	*34*	*47*	*8.6*	*3500*	*5000*	*7200*
EC_{10} - EC_{12}	*74*	*250*	*13*	*16000*	*5000*	*9200*
EC_{12} - EC_{16}	*140*	*1800*	*23*	*36000*	*5100*	*10000*
$EC_{>16}$ - EC_{21}	*260*	*1900*	*46*	*28000*	*3800*	*7600*
$EC_{>21}$ - EC_{35}	*1100*	*1900*	*370*	*28000*	*3800*	*7800*
$EC_{>35}$ - EC_{44}	*1100*	*1900*	*370*	*28000*	*3800*	*7800*
Aliph + Arom EC >44-70	*1600*	*1900*	*1200*	*28000*	3800	7800
Aromatic						
Benzene	**0.08**	**0.3**	**0.017**	**28**	*72*	*90*
Ethyl benzene	**65**	**170**	**16**	**520**[8] [17000]	**520**[8] *[24000]*	**520**[8] *[17000]*
Toluene	**120**	**610**	**22**	**860**[8] [59000]	**860**[8] *[56000]*	**860**[8] *[87000]*
Xylene[9]	**41**	**53**	**28**	**480**[8] [69000]	**480**[8] *[41000]*	**480**[8] *[17000]*
Phenol	**180**	**310**	**66**	**760**[14] (31000)	**760**[14] *(10000)*	**760**[14] *(7600)*
Polycyclic Aromatic Hydrocarbons (PAH)						
Naphthalene	*2.3*	*2.3*	*4.1*	*190*	*4900*	*1200*
Acenaphthylene	*170*	*2900*	*28*	*83000*	*15000*	*29000*
Acenaphthene	*210*	*3000*	*34*	*84000*	*15000*	*29000*
Fluorene	*170*	*2800*	*27*	*63000*	*9900*	*20000*
Phenanthrene	*95*	*1300*	*15*	*22000*	*3100*	*6200*
Anthracene	*2400*	*31000*	*380*	*520000*	*74000*	*150000*
Fluoranthene	*280*	*1500*	*52*	*23000*	*3100*	*6300*
Pyrene	*620*	*3700*	*110*	*54000*	*7400*	*15000*
Benz(a)anthracene	*7.2*	*11*	*2.9*	*170*	*29*	*49*
Chrysene	*15*	*30*	*4.1*	*350*	*57*	*93*
Benzo(b)fluoranthene	*2.6*	*3.9*	*0.99*	*44*	*7.1*	*13*
Benzo(k)fluoranthene	*77*	*110*	*37*	*1200*	*190*	*370*
Benzo(a)pyrene	*2.2*	*3.2*	*0.97*	*35*	*5.7*	*11*
Indeno(123cd)pyrene	*27*	*45*	*9.5*	*500*	*82*	*150*
Dibenzo(ah)anthracene	*0.24*	*0.31*	*0.14*	*3.5*	*0.57*	*1.1*
Benzo(ghi)perylene	*320*	*360*	*290*	*3900*	*640*	*1400*
Chlorinated Aliphatic Hydrocarbons						
Vinyl chloride	*0.00064*	*0.00077*	*0.00055*	*0.059*	*3.5*	*4.8*
Trichloroethene (TCE)	*0.016*	*0.017*	*0.041*	*1.2*	*120*	*70*
1,1,1,2 Tetrachlorethane	*1.2*	*1.5*	*0.79*	*110*	*1400*	*1500*
Tetrachlorethene (PCE)	*0.18*	*0.18*	*0.65*	*19*	*1400*	*810*
1,1,1 Trichlorethane	*8.8*	*9*	*48*	*660*	*140000*	*57000*

Notes

1. All values above are in mg/kg
2. **Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters**, *numbers in italics are S4ULs*, ***numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters*** and underlined numbers are C4SLs
3. Soil organic matter (SOM) is assumed to be 1% - DEFAULT VALUE
4. Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
5. For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
6. For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
7. For classrooms consider increasing the dust loading fator in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m^{-3}
8. Based on vapour saturation limt as suggested by EA / [ ] model value
9. Lowest of o-, m- and p-xylene
10. Based on comparison of inhalation exposure with inhalation TDI
11. Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
12. Based on a comparison of oral and dermal soil exposure with oral Index Dose only
13. Averaged over and based on lifetime exposure
14. Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
15. NA: Not applicable

Appendix D – Qualitative Risk Assessment Rationale

The site-specific risk assessment, presented in this report, follows the principle of establishing whether there is a viable linkage between a contaminant source to a potential receptor, via an exposure pathway.

The risk assessment corresponds with the total site area and incorporates both descriptive (qualitative) and, where available, numerical (quantitative) lines of evidence.

Risk assessment is the process of collating known information on a hazard or set of hazards to estimate actual or potential risk to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem, or future construction materials. Receptors can be connected to the source by one or several exposure pathways such as direct contact for example. Risks are managed by isolating the receptor or intercepting the exposure pathway or by isolating or removing the hazard.

Without the three essential components of a source, pathway, and receptor there can be no risk. Therefore, the presence of contaminant source on a site does not necessarily mean there is a risk.

The risk assessment considers the likelihood of a particular event taking place (accounting for the presence of the source and receptor and the viability of the exposure pathway) in conjunction with the severity of the potential consequence (accounting for the potential severity of the hazard and the sensitivity of the receptor).

In the risk assessment the consequence of the hazard has been classified as severe, medium, mild, or minor and the probability (likelihood) of the circumstances occurring classified as high likelihood or low likelihood or unlikely.

The consequences and probabilities are subsequently cross correlated to give a qualitative estimation of the risk using Department of the Environment risk classifications as detailed in the table below and as referenced in CIRIA C552.

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability (Likelihood)	**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

In accordance with DoE guidance, the following categorisation of **consequence** has been developed.

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to an ecosystem or organisation forming part of such ecosystem.	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health. Pollution of sensitive water resources. A significant change in an ecosystem or organism forming part of such ecosystem.	Concentration of a contaminant from site exceeds the generic or site-specific assessment criteria. Leaching of contaminants from a site to a Principal or Secondary A aquifer. Death of a species within a designated nature reserve. Lesser toxic and asphyxiate effects
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures, and services. Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater (Inc. Secondary B aquifers). Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). Easily repairable effects of damage to buildings, structures, and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discoloration of concrete.

In accordance with DoE guidance, the following categorisation of **probability** has been developed.

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

In accordance with DoE guidance, the following categorisation of **risk** has been developed.

Classification	Definition
Very High Risk	There is a *high probability* that *severe harm* could arise to a designated receptor from an identified hazard at the site without appropriate further action.
High Risk	*Harm* is *likely to arise* to a designated receptor from an identified hazard at the site without appropriate further action.
Moderate Risk	*It is possible* that without appropriate further action *harm could arise* to a designated receptor. It is relatively *unlikely* that any such harm would be *severe,* and if any harm were to occur it is *more likely* that such harm would be *relatively mild.*
Low Risk	*It is possible* that *harm could arise* to a designated receptor from an identified hazard. It is *likely* that, at worst, if any harm was realised any effects would be *mild.*
Negligible Risk	The presence of an identified hazard does not give rise to the potential to cause harm to a designated receptor.

The term ‘risk’ in this instance refers to the risk that the source, pathway, receptor linkage for a given source of contamination is complete. It does not refer to immediate risk to individuals or features present on the site from potential contaminants and is intended to be used as a tool to assess the necessity of further investigation.