ARCADIS Design & Consultancy for natural and built assets

METALS PROCESSING AREA, FORMER STEELWORKS, REDCAR

Phase II Environmental Site Assessment (Shallow Soils)

South Tees Development Corporation

REPORT NO. 10035117-AUK-XX-XX-RP-ZZ-0125-02-MRA_Shallow_Soils

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1 Introduction

1.1 Project Background

The Metals Processing Area (MPA) (the site) is a land parcel situated at the Former Redcar Steelworks located within the Redcar, Lackenby, Grangetown and South Bank conurbations of the Borough of Redcar & Cleveland, within the industrial area generally known as 'South Tees'. Figure 1 in Appendix A provides details of the site location.

The "South Tees Regeneration Master Plan" dated November 2019 has been developed detailing the industrial-led regeneration of the Former Redcar Steelworks into a world class employment-generating zone and economic growth enabler for the Tees Valley.

The Masterplan has identified the MPA as being located within the South Bank Zone. The site is a priority development area and Arcadis understands this report is to be used within a detailed planning application for "*Demolition of existing buildings/ structures and engineering operations associated with ground remediation and preparation of land for development*".

1.2 Contract Details

Arcadis (UK) Limited (Arcadis) was appointed by South Tees Development Corporation (STDC) to oversee and manage a ground investigation undertaken by Allied Exploration and Geotechnics Limited (AEG) and to provide consultancy advice on the redevelopment of the site.

The work was carried out in accordance with the "*Prairie Site, Warrenby Site and the SLEMS Ground Investigations Provision of Consultancy Services* Agreement between Tees Valley Combined Authority and Arcadis.

The scope of works was defined by Arcadis, on behalf of STDC, as presented in "Metals Recovery Area – PM and Technical Support (updated)" dated 1st July 2020. At the request of STDC the investigation was split into two phases, an initial investigation of shallow soils (this phase) and a subsequent investigation of deeper soils and groundwater to be conducted when further certainty on redevelopment scenarios has been confirmed.

1.3 Projects Aims and Objectives

As technical consultant, our specific objectives of this phase of works were to:

- Manage and technically supervise the site works, undertaken by AEG, on behalf of STDC;
- Direct the site works to ensure compliance by the ground investigation contractors with existing site management protocols and procedures;
- Specify the requirements for laboratory analysis;
- Analyse the results of ground investigations; and,
- Prepare interpretative technical reports, namely;
    - Prepare an interpretative technical report including an assessment of identified environmental risks associated with the site considering the findings of the initial shallow soils investigation (*this document*).
    - Prepare an interpretative technical report including an assessment of identified environmental risks associated with the site considering the findings of the subsequent deep soils and groundwater investigation (*to be reported under a separate cover*),

1.4 Report Aims

The aim of this environmental site assessment report is to use the available information to develop a conceptual site model (CSM) for the site and identify the potential significance of any source-pathway-receptor (SPR) linkages identified by the CSM in relation to shallow soils at the site. Where significant, and potentially complete pollutant linkages are identified, suitable risk management/remediation recommendations are to be made.

1.5 Reliability / Limitations of Information

A complete list of Arcadis Study Limitations is presented in Appendix B.

It should be noted that ground conditions between exploratory holes may vary from those identified during this ground investigation; any design should take this into consideration.

2 Site Conceptualisation

No specific Phase I Environmental Site Assessment (ESA) exists for the site. However, the northern portion of the site is covered by the following document supplied by STDC:

- TS4 South Bank – Phase 1 Geo-Environmental Desk Study, prepared by CH2M Hill for the Homes and Communities Agency, report ref. 678079_TS4_002 dated August 2017 and marked Final.

The site is also considered in:

- South Industrial Zone ES - Vol 2 - Chapter H (Ground Conditions and Remediation), prepared by Arcadis for STDC and dated July 2020.

In addition, STDC also supplied the following documents:

- Former Steelworks Land, South Tees Outline Remedial Strategy, Prepared for South Tees Development Corporation by Wood, Ref 41825-wood-XX-XX-RP-OC-0001_S0_P01 dated 25th June 2019 [Wood 2019]

This section incorporates a review of the above reports, publicly available records, and data collected as part of the site investigation works by AEG4291 Metal Processing Area Shallow Soils Investigation (Final Report) presented as Appendix C.

The scope completed by AEG included:

- 31no. trial pits excavated by a 30 tonne tracked excavator, to a target depth of 4.5m, refusal, or until natural material is encountered; and,
- Soil sampling for in-field assessment and submission to Derwentside Environmental Testing Services (DETS), AEG in-house Geotechnical Laboratory and Thomas Research Services (TRS) laboratories for chemical and geotechnical testing;

2.1 Site Location

The MPA is located in the south west of the Former Redcar Steelworks and is bound by land occupied by MGT Teesside to the north, PD Ports to the east, the SLEMs and Cleveland Channel to the South and the wider south bank site to the west. The site elevation generally ranges from approximately 7m to 12m above Ordnance Datum (AOD).

The centre of site is located at National Grid Reference: 454600, 522600; and an indicative post code for the site is TS10 5QW.

A Site Location Plan is presented on Figure 1 within Appendix A.

2.2 Site Description

The site is approximately 21.5 hectares in size and approximately rectangular in shape tapering to the south. The southern boundary is marked by a rapid change in level to the Cleveland Channel (approx. 2 to 3m AOD) with the SLEMs facility beyond. The Cleveland Channel discharges into the Lackenby Channel which runs parallel to the eastern boundary of the site. Both the Cleveland and Lackenby channels are tidal and discharge into the River Tees a short distance north of the site.

PD Ports facilities are located to the east (beyond the Cleveland Channel) and include a utility corridor, port buildings and wharf facilities. The area north of the site is currently under development as a biomass power station operated by MGT Teesside. A third party landfill (land rise) Highfield Environmental is located to the east of the site, the landfill is understood to accept wastes types including domestic and special.

At the time of the siteworks the site is covered by stockpiles of aggregates from the steelmaking process, which are being processed by a contractor. There are infrequent concrete structures including a large viewing platform in the centre of the site, south of which are four buildings. With the exception of the viewing platform and the stockpiles the area is generally level and covered with aggregates of steel biproducts.

2.3 Site History

Based on a review of the documents in 2.1, the site was originally sand and mud associated with the Tees Estuary. The site was reclaimed from the Tees between 1896 and 1938 by the assumed deposition of waste products from the steelmaking process. A number of small structures and a gun emplacement are shown on mapping from 1952 along with railway lines from 1959. The site is shown in its approximate current layout from 1991.

The site is understood to have been leased from Tata Steel to Harsco who undertook “recycling materials from iron and steelmaking for recovery of metals” under permit PP3338MT.

2.4 Geology

Review of the British Geological Survey (BGS) data suggests that the majority of the site is underlain by Tidal Flat Deposits predominantly comprising sand and clay This is anticipated to be underlain by Glaciolacustrine Deposits and Glacial Till based on data from historic boreholes in the vicinity of the MPA.

Bedrock beneath the site is anticipated to comprise Mercia Mudstone. Excerpts from the BGS mapping data are presented as Figure 2 below and in Appendix A.

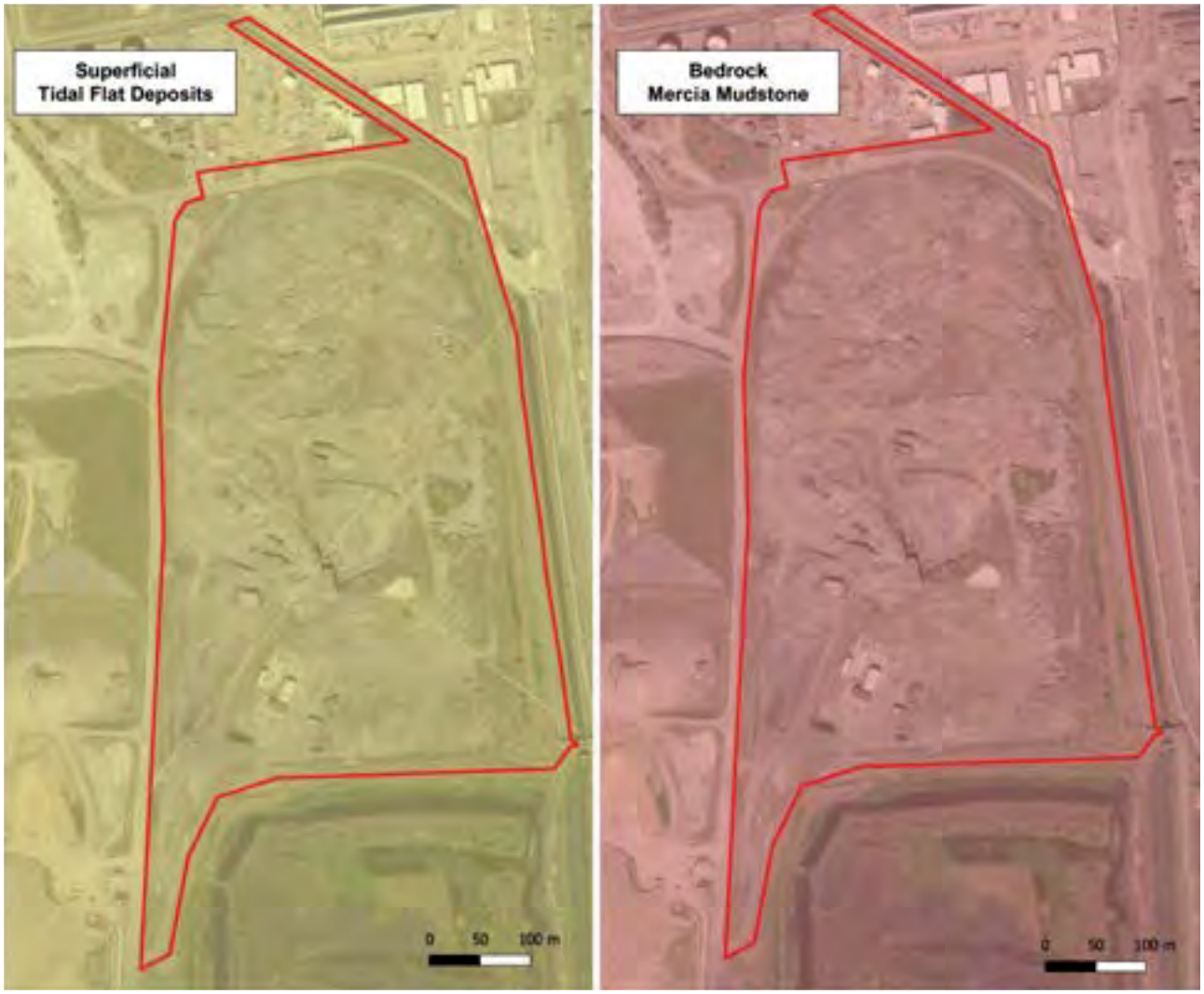


Figure 2: Excerpts from BGS Mapping

The following table provides an overview of the site-specific geology encountered during the investigation across the site. The full geology encountered is provided on the trial pit logs within Appendix C.

Interpreted Unit	Minimum Basal Depth (m bgl)	Maximum Basal Depth (m bgl)	Comment
Made Ground	>4.5	>4.5 (base not proved at majority of locations)	Site surfacing comprised a grey aggregate of slightly sandy gravel of slag. The Made Ground in all locations with the exception of MPA_AUK_TP102 comprised slag rich deposits which contained 75 – 100% recovered as gravel and cobbles and varying quantities of ash, and clinker. Slag was vesicular and noted to be predominantly grey but with green, brown, purple and white colouration and or precipitates on the surface. Occasional iron rich deposits were also noted on the slag. Fragments of concrete and metal were noted within the deposits. The slag deposits were well bound and potentially partially fused across the Made Ground which required significant effort to excavate. More humic material was noted at the surface in MPA_AUK_TP102, underlain by slag rich deposits and a concrete slab obstruction.
Tidal Flat Deposits (Secondary A Aquifer)	N/A	N/A	Not encountered
Glaciolacustrine Deposits	N/A	N/A	Not encountered
Glacial Till	N/A	N/A	Not encountered
Mercia Mudstone (Secondary (B) Aquifer)	N/A	N/A	Not encountered

Made Ground was encountered in all intrusive locations and proven to a thickness of up to 4.5m. The base of the Made Ground was not proven in any of the 31 trial pits, therefore, greater thickness of made ground material exists across the site.

Two types of Made Ground were noted:

- **Slag-dominant material:** Generally ranging from gravel to boulder size fragments of slag. The slag material generally ranged from light grey to dark grey/black in colour, but a wide range of other colours were also noted including blue, brown, green, and purple. Discolouration of the slag surface was also noted with white crystallisation/discolouration often noted on the outer surface along with occasional iron rich areas. Slag is estimated to comprise 75 - 100% of the soil matrix, weighted towards the latter.
- **Granular Made Ground:** Identified in 5 locations only (MPA_AUK_TP101, MPA_AUK_TP110, MPA_AUK_TP119, MPA_AUK_TP127, and MPA_AUK_TP128) and was described as a sandy fine to coarse gravel with many cobbles. Gravel and cobbles include brick, concrete, wood and other demolition materials, slag was not the dominant constituent although often still present within the soil matrix. Although present in the locations listed above the pits were dominated by slag rich materials.

2.5 Hydrogeology

Groundwater was not encountered during the investigation. The hydrogeological map for the area (Sheet 1: Hydrogeological Map of England and Wales, 1:625,000 scale) indicates that groundwater beneath the site within the Mercia Mudstone Formation is at an elevation of approximately 0m AOD with groundwater elevation contours indicating a flow to the north. The site is not located within a Groundwater Source Protection Zone

and given the proximity to the Tees Estuary groundwater is likely to be tidally influenced and potentially subject to saline intrusion.

2.6 Hydrology

The closest surface water features to the site are the Cleveland Channel which forms the southern boundary of the site and the Lackenby Channel which is located approximately 40m to the east of the site. The Cleveland Channel flows into the Tees via the Lackenby Channel. Both the Cleveland and Lackenby channels are tidally influenced.

2.7 Potential Areas of Concern

Based on a review of the documents listed in Section 2.1 above and the DEFRA Magic Website https://magic.defra.gov.uk/MagicMap.aspx accessed 3rd August 2020 the following potential areas of concern (Environmental PAOC) have been identified for the site and are summarised on Figure 3 below and in Appendix A.

Figure 3: Potential Areas of Concern

Note: PAOC01 - Made Ground not shown on plan)

The significance of these potential sources is considered further in Section 3.2.

3 Environmental Site Condition Assessment

3.1 Introduction

This section summarises the findings of Section 2 in the form of an environmental (land contamination) CSM.

The CSM allows a qualitative evaluation of potentially active “pollutant linkages” at the site; these being plausible scenarios whereby a contamination source is connected to a possible receptor by one or more pathways:

- Potential sources of contamination: these include any actual or potentially contaminating materials and activities, located either on or in the vicinity of the site;
- Potential pathways for contamination migration: these comprise the routes or mechanisms by which contaminants may migrate from the source to the receptor including environmental migration pathways and human health exposure pathways; and
- Potential receptors of contamination: these include present and/or future land users, ecological systems, water resources and property.

The potential significance of these source-pathway-receptor linkages will be assessed in the Section 4.

3.2 Contamination Sources

Based on the information reviewed in this report the following potential contamination sources have been identified:

3.2.1 On-Site

On-site sources have been identified associated with Made Ground and potential contaminants of concern (CoC) associated with former site uses. The table below summarises the most significant potential on-site sources and the primary contaminants associated with these sources. The identified CoC are considered to represent those likely to be present from other less significant sources.

Potential On-Site sources	Primary Contaminants
Made Ground including slag deposits	Metals (including heavy metals), polycyclic aromatic hydrocarbons (PAHs), cyanide, thiocyanate, sulphate, pH, ammonia, and asbestos. Potential source of ground gas if found to be have a high organic content.
Substation	Hydrocarbons, asbestos, and polychlorinated biphenyls (PCBs)
Buildings of unknown use	Metals, and asbestos
Gun emplacement	Unexploded ordnance
Garage and maintenance workshop	Metals, asbestos, TPH, PAH, acids and bases, VOCs, SVOCs, pH
Slag crushing and metal cleaning plant	Metals (including heavy metals), cyanide, thiocyanate, sulphate, pH, and ammonia.
Railway lines and sidings	Metals, asbestos, TPH, PAH, VOC, SVOC, PCB, and pH.

3.2.2 Off-Site

Potentially contaminative land uses have been identified in the vicinity of the site, the most pertinent of which are presented in the table with potentially associated contaminants:

Potential On-Site sources	Primary Contaminants
Highfield Environmental	Metals (including heavy metals), PAH, cyanide, thiocyanate, sulphate, pH, ammonia, asbestos, total petroleum hydrocarbons (TPH), volatile organic compounds (VOC), semi volatile organic compounds (SVOC), and ground gas.
SLEMS / CLE9 – The SLEMS facility processes BOS Oxide. BOS material and other steelmaking biproducts are stockpiled on site. The SLEMS is understood to be located on top of the former CLE9 landfill.	Metals (including heavy metals), PAH, cyanide, thiocyanate, sulphate, pH, ammonia, asbestos, total petroleum hydrocarbons (TPH), volatile organic compounds (VOC), semi volatile organic compounds (SVOC), and ground gas if found to have a high organic content.
Former Oil Terminal and tanks	Metals, asbestos, TPH, PAH, acids and bases, VOCs, SVOCs, pH and PCBs
PD Ports and Tarmac leasehold	Metals, asbestos, TPH, PAH, acids and bases, VOCs, SVOCs, pH and PCBs

Contaminants of concern in green are of generally low environmental mobility and have therefore been discounted for the sources in question based on the distance from the site.

3.3 Contamination Sources Assessment

The contamination assessment will be undertaken in two ways – contaminants that are dependent upon the material composition (e.g. metals, inorganics, asbestos and PAHs) will be assessed separately for each material type and contaminants that are associated with a particular point source (e.g. hydrocarbons) will be assessed based on the likely source. This report is focused on shallow soils and does not fully assess the risks to Controlled Waters however, soil leachate testing was conducted to give an indication of risk.

The laboratory certificates are presented in Appendix C.

3.3.1 Made Ground

Asbestos

Asbestos (identified as chrysotile) was identified in three samples of granular Made Ground, quantification was requested on these samples and reported as follows:

- MPA_AUK_TP101_SO_0350 – 0.003%
- MPA_AUK_TP102A_SO_0100 – 0.002%
- MPA_AUK_TP103_SO_0060 – 0.002%

A potential ACM (cement pipe) was noted in situ in MPA_AUK_TP117.

Metals and Inorganics

With the exception of hexavalent chromium and mercury the metals analysed for were detected in each of the soil samples tested. Mercury was identified in 4 of the 32 samples tested. Concentrations of metals were notably higher in the samples of slag dominant made ground compared to granular made ground.

Levels of cyanide and thiocyanate were low across the site, though more variation was noted in soluble sulphate concentrations. Soil samples were on average strongly alkaline ranging between pH 9.8 and 12.7.

Leachability testing showed the majority of metals were present in the leachate from made ground samples. Leached concentrations of metals were noted in all samples tested with arsenic, barium, copper, magnesium, manganese and vanadium leaching in all samples. The pH of leachate samples was noted to be slightly alkaline and lower than the corresponding soil samples.

Polyaromatic Hydrocarbons

Concentrations of PAH were measured in 29 of the 32 soil samples analysed, and in all eight samples of soil leachate; comprising a broad range of both light, mid and heavy end compounds.

Total Petroleum Hydrocarbons

Concentrations of TPH were measured in 14 of the 32 soil samples analysed at concentrations ranging between 1000mg/kg (MPA_AUK_TP113_SO_0090) and 33mg/kg (MPA_AUK_TP117_SO_0060), the former and a detection in MPA_AUK_TP101_SO_0350 (560mg/kg) are the only detections measured over 500mg/kg.

Total petroleum hydrocarbons were not measured above the method detection limit (MDL) in soil leachate.

Other Contaminants

No elevated concentrations of VOC, SVOC, or PCBs were measured in any of the soil samples with the exception of carbazole and dibenzofuran detected at the MDL in MPA_AUK_TP121_SO_0080.

3.4 Pathways

Potential migration pathways based on a proposed commercial industrial end use are discussed below.

3.4.1 Airborne Migration Pathways

- The majority of the site is currently not formally surfaced, as such, particulate inhalation due to dust generation is a potentially active pathway if hardstanding or buildings were not present across the site in a future development scenario.
- Vapour inhalation pathways in relation to contaminants in soil and groundwater are potentially active, both for an exposure scenario in outdoor or indoor air space.
- During potential re-development works, sub-surface soils could be exposed at the surface due to trenching and or re-profiling requirements and therefore dust has the potential to be generated. Notwithstanding this, typical dust suppression techniques should be employed so that exposures would be minimised.
- Migration and accumulation of permanent ground gases originating from the made ground on site in confined spaces leading to asphyxiation and/or explosion is considered potentially active.

3.4.2 Direct Contact Exposure Pathways

- The proposed site surfacing under any potential re-development scenario is unknown; should a significant portion of the site area be covered in some form soft landscaping, dermal contact and ingestion pathways in relation to soil would be considered potentially active. Given the depth to groundwater (greater than 4.5m bgl, unless the final ground elevation is reduced significantly), direct contact pathways in relation to groundwater are not considered active.
- Direct contact pathways with soils could be active throughout a potential redevelopment; typical mitigation measures such as personal protective equipment (PPE; overalls, gloves etc.) could be used to mitigate this risk. If unexpected contamination (such as non-aqueous phase liquids (NAPL)) were identified during redevelopment works, additional PPE may be required as mitigation.

3.4.3 Aqueous Migration Pathways

- Leaching of contaminants in the shallow soils to groundwater within the Tidal Flat Deposits is considered potentially active;
- The thickness of Glacial Till on-site between the Tidal Flat Deposits and the underlying Mercia Mudstone is not well delineated therefore the potential for vertical migration of contaminants to the underlying Secondary (B) Aquifer is considered potentially active.
- Given the granular nature of the identified and thickness of the Made Ground and the permeability of the Tidal Flat Deposits, lateral migration of off-site impacts onto the site from nearby PAOC is considered

potentially active. The most likely source would be the SLEMS and Highfield Environmental waste facilities located hydraulically down gradient of the site.

- Lateral migration of on-site impacts towards the Cleveland and Lackenby watercourses is considered potentially active given the identified thickness and nature of the Made Ground. The potential for infiltration of CoC into watercourses *via* surface runoff or migration of rainfall through the made ground is considered potentially active.
- Depending on pile design for future structures, vertical migration of impacts down foundation piles is considered potentially active unless appropriately designed.

3.5 Receptors

The potential receptors to be considered in any contaminated land scenario can be summarised as follows:

3.5.1 Human Health

For the purposes of this assessment it is assumed that the proposed development will comprise a commercial or industrial end use, and as such commercial and industrial workers are the primary receptor of concern for any contamination risk. The risk would be influenced by the duration and location of the staff work regimes.

Users of the adjacent buildings (industrial workers and neighbouring residents) could also be at risk. However, for exposure to occur, active cross-boundary migration pathways would be required. It is noted that the neighbouring residents are situated over 1km from the site, and as such are not considered to be at significant risk from the site.

3.5.2 Property (buildings, etc)

The proposed development will include new structures and associated infrastructure, which could be subject to potential sulphate attack in relation to buried concrete. Given the presence of slag deposits within the Made Ground the potential for expansive slag to impact structures is considered potentially active, the risks from ground gas are also considered potentially active. It is understood that mitigation of risks to property will be the responsibility of the developer.

3.5.3 Controlled Water

Groundwater is a Controlled Water; therefore, the groundwater beneath the site requires consideration. At this site, the underlying geology comprises Tidal Flat Deposits which are classified as a Secondary (A) Aquifer and the Mercia Mudstone Formation classified as a Secondary (B) Aquifer both of which are considered groundwater receptors at the site. It is noted that the site is not located within a Source Protection Zone (SPZ) and no SPZ's have been identified within 1km of the site. Additionally, the site is not located in a drinking water protected area or a drinking water safeguard zone, and neither zone is present within 1km of the site. The site adjoins a tidal section of the River Tees and therefore there is the potential for saline intrusion into the underlying aquifers limiting their resource value.

Surface water courses are also considered Controlled Water receptors; given its presence at the site boundary the Cleveland is considered the primary surface water receptor for the site.

3.5.4 Ecological

The Cleveland and Teesmouth Coast SSSI, SPA, and RAMSAR is located approximately 350m to the north of the site.

Based on the distance from the site the risk to ecological receptors is considered low. In addition, potential discharges from the site to the Teesmouth and Cleveland Coast SPA and RAMSAR via the River Tees are likely to be limited by tidal exchange and the large volume of the River Tees receiving water. This is in line with the findings of Wood 2019.

3.6 Obstructions

Frequent hard deposits of slag presented issues with progression of a number of the exploratory holes during the course of the investigation completed by AEG (trial pit logs presented in Appendix C), concrete structures

were also noted in MPA_AUK_TP102 and MPA_AUK_TP129. It should be noted that further obstructions may be encountered in areas not investigated.

3.7 Slag Testing Data

A total of 5 samples of slag recovered from trial pits were submitted for examination the results are presented in Appendix C and summarised below.

Sample	Depth	AEG Estimated % Slag
MPA_AUK_TP101	1.9	75 - 100%
MPA _AUK_TP107	1.5	75 - 100%
MPA _AUK_TP119	2.0	75 - 100%
MPA _AUK_TP120	3.8	75 - 100%
MPA _AUK_TP122	3.8	75 - 100%

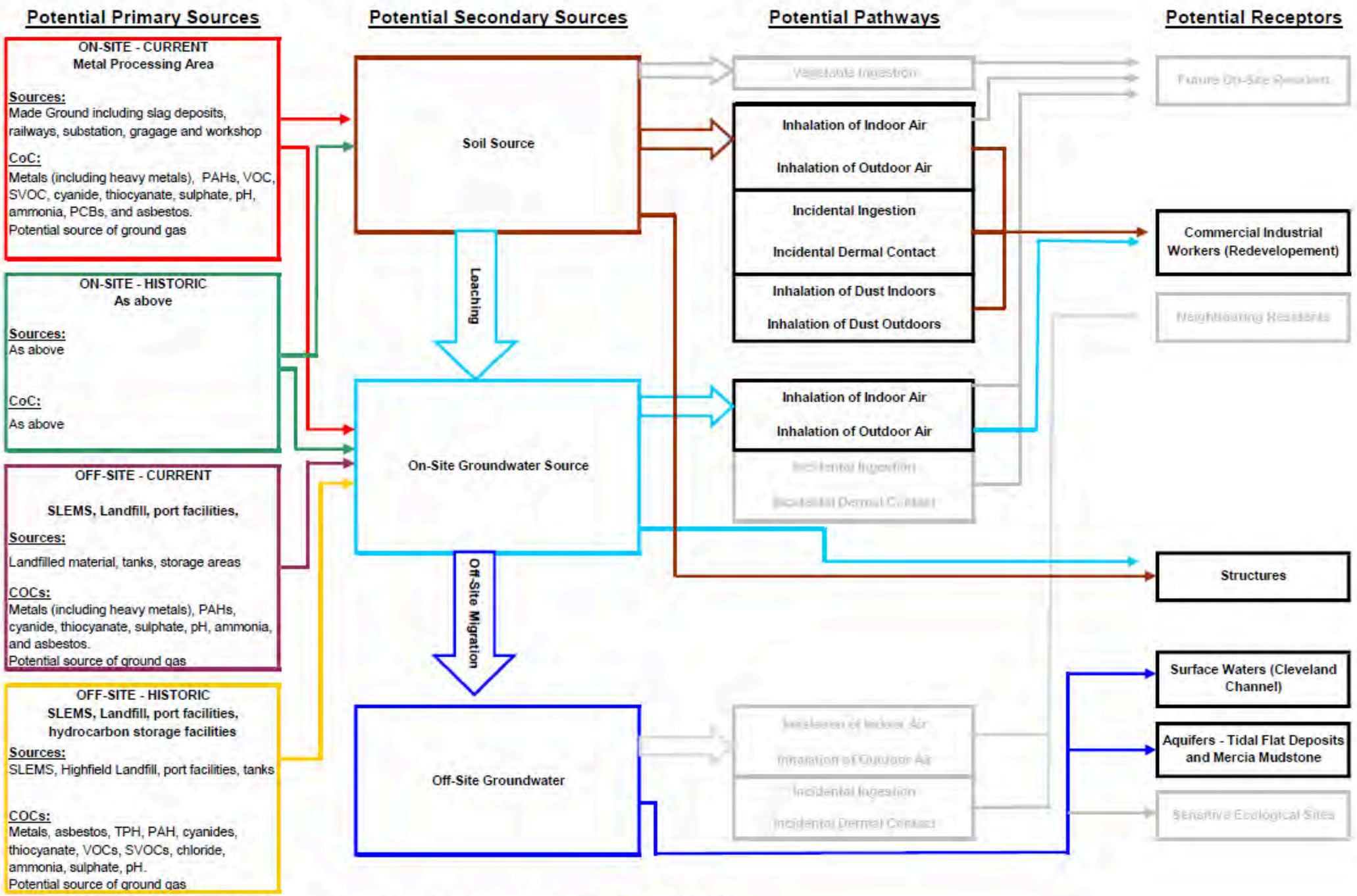
- Four samples contained mixed slag deposits with blast furnace slag predominating in 2 samples and basic steel slags dominating in the remainder. One sample comprised entirely blast furnace slag (MPA_AUK_TP107)
- Small amounts of basic refractory materials were noted in 1 slag sample (MPA_AUK_TP122), these materials are particularly susceptible to expansion.
- Samples containing medium or higher proportions of basic steel slag were tested for free calcium and magnesium oxides. Free calcium oxide compositions ranged from 0.8% to 1.4% and free magnesium oxides were measured at 0.9%. This indicates expansion potential within the slags.
- Samples containing medium or higher proportions of basic steel slag were subject to 28 day accelerated expansion tests. The results showed expansion ranging between 0.29% and 0.9%.
- The samples tested contained did not contain Ettringite indicating expansion has not occurred in the past, however this does not mean that expansion will not occur.

The analysis report is presented in Appendix D.

3.8 Conceptual Site Model

The above data has been used to produce an initial CSM for the site, this is presented below as Figure 4.

Figure 4
Outline Conceptual Site Model - Commercial Industrial End Use



4 Generic Quantitative Risk Assessment

4.1 Tiered Approach

The purpose of this assessment is to quantify potential risks to the human health, controlled waters, ecological and future built receptors identified in the CSM in relation to the redevelopment of the site for a generic commercial/industrial use.

The following scenarios are not considered in this section:

- Risks to Construction Workers – any redevelopment and construction work should be conducted in full recognition of HS(G)66.
- Nuisance health effects – the Statutory Nuisance Act considered olfactory impacts from odours and allows comparison of enclosed space air concentrations with odour threshold concentrations.
- An assessment of the geotechnical development constraints which is outside the scope of this document.

Quantitative assessment of risks arising from soil and groundwater contamination are assessed in accordance with the framework presented in Contaminated Land Report 11 (CLR 11) (EA, 2004) and Land Contamination: Risk Management (LC:RM) (EA, 2020). This sets out a tiered approach to quantitative risk assessment comprising:

- Generic Quantitative Risk Assessment (GQRA) - Comparison of site contaminant levels against generic standards and compliance criteria including an assessment of risk using a source-pathway-receptor model.
- Detailed Quantitative Risk Assessment (DQRA) - Derivation of site-specific risk assessment criteria and calculation of site specific clean-up goals.

In this report, a GQRA has been carried out. The potential pollutant linkages identified in the preliminary CSM for human health and controlled water receptors have been assessed by comparison against relevant generic assessment criteria (GAC). These have been derived using conservative assumptions to enable potential pollutant pathways that do not pose unacceptable risks to receptors to be identified and discounted. Exceedance of a GAC does not imply that an unacceptable risk is necessarily present, rather that further assessment may be required to verify the potential risk.

It is assumed that the site will be redeveloped as a typical commercial industrial development comprising office buildings, hardstanding and some areas of soft landscaping. The site has not been zoned at this stage and all data has been considered on an individual sample basis.

4.2 Human Health Risks

4.2.1 Selection of Soil GAC

Potentially active pollutant linkages and contaminants of concern (CoC) in relation to human health risks have been identified in the initial CSM as:

A. Vapour inhalation of indoor and outdoor air from volatile contaminants in soils, (potential CoC include volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs))

B. Vapour inhalation of indoor and outdoor air from volatile contaminants in shallow groundwater, (potential CoC include VOCs and SVOCs)

C. Dermal contact/ingestion of soil (potential CoC include heavy metals, organic/inorganic compounds)

D. Dust inhalation (potential CoC include asbestos, volatiles, and heavy metals)

For the purposes of this assessment it is assumed that future re-development will comprise a commercial or industrial end use and, as such, commercial and industrial workers are the primary receptor of concern for any contamination risk. The risk would be influenced by the duration and location of the staff work regimes. For the basis of this assessment, it is assumed that site workers will be on-site for a “standard” 8 hour working day.

Commercial end use assumes a pre-1970s commercial property is present at the site with some open areas uncovered by hardstanding and is therefore regarded as conservative for a redevelopment scenario as new structures are assumed to be constructed to current standards.

To assess potential linkages A, C and D above, GAC have been chosen, based on an assumed industrial/commercial end use. Criteria published by authoritative industry bodies and commonly accepted by regulators for use under the planning regime for development sites have been used first. For contaminants for which no published values are available, Arcadis derived criteria (developed following the CLEA framework (v1.07)) or foreign national criteria have been used.

The GAC comprise (in order of priority):

- LQM/CIEH Suitable for Use Levels (S4UL) (LQM / CIEH, 2015),
- Department of Environment Food and Rural Affairs (DEFRA) Category 4 Screening Levels (C4SL) (DEFRA, 2012),
- Arcadis derived generic assessment criteria based on CLEA v1.07,
- United States Environmental Protection Agency (U.S. EPA) Regional Screening Levels (RSLs) (USEPA, 2018)

Soil organic matter recorded in 32No. soil samples obtained from the site ranged from 0.2 to 4.2 % SOM. As such, the S4UL selected as GAC are those for a commercial end use assuming 1% SOM.

It is noted that the USEPA RSLs do not consider the risk to human health via the inhalation of vapour pathway. As such, should concentrations of volatile or semi-volatile CoC be measured above MDL for which only a USEPA RSL GAC is available, further consideration may need to be given to the risk to human health from inhalation of vapours.

The selected human health GAC for soil are presented in Appendix E:

4.2.2 Soil Quality Screening

Contaminant concentrations in soil samples have been compared with the soil GAC in Appendix E. Contaminants which were measured in excess of the GAC are summarised below. Contaminants that have not been identified in excess of their respective GAC are not considered to represent a significant risk to identified human health receptors and as such do not require further assessment in relation to the redevelopment of the site unless the above assumptions are not valid.

The following samples were analysed:

- 27 No. samples of slag-dominated Made Ground
- 5 No. samples of granular Made Ground

None of concentrations of CoC measured in the 32 soils samples were in excess of the soil GAC for the contaminants for which screening criteria are available, therefore there is not considered to be a significant risk to human health from these CoC in shallow soils. The maximum recorded concentrations in soil for all contaminants are listed in Appendix E.

Contaminants for which no screening criteria were available have been reviewed. Most contaminants, including polychlorinated biphenyls (PCBs) and VOCs were recorded below the method detection limit (MDL) in all soil samples.

Contaminants measured in soil at concentrations above MDL, for which no screening criteria were available were aluminium, iron, magnesium, manganese, silicon, total cyanide, sulphate, and carbazole. Potential human health risks from these are qualitatively assessed in Section 4.2.4.

4.2.3 Asbestos in Soil

A total of 32No. soils samples were screened by polarised light microscopy in accordance with HSG248 for the presence of asbestos (HSE, 2005). In 3No. sample asbestos was detected as bundles of fibres (chrysotile). The detections were recorded in MPA_AUK_TP101 (0.003%), MPA_AUK_TP102A (0.002%), and MPA_AUK_TP130 (0.0025) at depths of 3.5, 1.0 and 0.6 metres below ground level (m bgl) respectively. The samples from MPA_AUK_TP101 and MPA_AUK_TP130 are noted to be within deposits containing demolition material, whilst the sample from MPA_AUK_TP102A is very slag rich. In pit MPA_AUK_TP130 similar material is encountered to the surface and therefore dust generation is considered a valid pathway.

4.2.4 Qualitative Risk Assessment for Substances in Soil without GACs

As shown in Appendix E, several contaminants including some PCBs, VOCs and SVOCs do not have a GAC available, but were recorded at less than the MDL in all soil samples. Based on a review of the MDLs, these are not considered to pose a significant risk to human health and are likely to indicate an absence of that contaminant group on the site, especially given the relatively low MDLs obtained.

The following were recorded at concentrations in excess of their MDL and with no readily available GAC identified for comparison: aluminium, iron, magnesium, manganese, silicon, total cyanide, sulphate, dibenzofuran and carbazole. With the exception of total cyanide, and carbazole, these are all elements present naturally in soil and some are biologically required nutrients. They may be elevated above natural levels where slag and other steelmaking wastes are incorporated into soil due to the site's former use, particularly manganese and iron. However, regardless of these elevations, their typically low toxicity is likely to mean these occurrences present a low risk of adverse harm to the development.

Total cyanide is known to be less toxic than free cyanide. When compared to the Arcadis site specific assessment criteria for free cyanide derived for the Prairie site (10035117-AUK-XX-XX-RP-ZZ-0088-01-Prairie_Risk Assessment), the concentrations of total cyanide are not in excess. As such, concentrations of total cyanide are not considered to represent a significant risk to human health receptors.

The SVOCs, dibenzofuran, and carbazole were detected at the MDL. These are indicative of incomplete combustion products and therefore consistent with the presence of steelmaking wastes. Both compounds were at the MDL and when compared to the GAC, dibenzofuran concentrations were not in excess. Given that the single concentration of carbozole measured at the MDL, the risk to human health from concentrations of carbozole is also considered to be low.

Other effects, such as phytotoxicity, are not assessed as the Made Ground encountered at the site is likely to be unsuitable as a growing medium and some form of capping with "clean" soil is likely to be incorporated into any future development.

4.2.5 Discussion

None of the potential contaminants of concern analysed in the soil samples were in excess of available GAC protective of human health via potential pollutant linkages A and C in Section 4.2.2 above. On this basis, these linkages are not considered active for shallow soils and are unlikely to pose a significant risk to human health. As the full depth of unsaturated Made Ground was not proven at the site the potential that contamination that could potentially pose a significant risk via pollutant linkage A exists at greater depth cannot be excluded at this point.

Groundwater was not encountered within the trial pits therefore the significance of pollutant linkage B cannot be assessed at this time and will require investigation during subsequent assessment works.

Asbestos fibres were identified in two samples, however only one of these contained obvious demolition materials, the other being primarily composed of slag deposit. Asbestos is potentially hazardous when inhaled and therefore pollutant linkage D (inhalation of dust) is considered potentially active as surface soils may become airborne during construction or if incorporated into soft landscaping without any cover. The highest risk is considered to be associated with the granular Made Ground, accepting however that the data does not suggest asbestos is prevalent at the site.

Acute risks to construction workers arising from short-term contact with contaminated soils during demolition and redevelopment of the site are not assessed by the chronic risk assessment methods in this report. During

construction works, site workers should remain vigilant to the possible risk of encountering isolated areas of contaminated material. Should potentially contaminated material be encountered, further testing may be required to assess the risk to health and safety of the site workers and the environment. All persons engaged in site construction works should be made aware of the findings of the intrusive investigation and the hazards associated with handling potentially contaminated materials. It is recommended that all works are conducted in accordance with the Health and Safety Executive publication entitled "Protection of Workers and the General Public during the Development of Contaminated Land" (HSE, 1991).

4.3 Risks to Controlled Waters

4.3.1 Selection of GAC

Potentially active pollutant linkages in relation to Controlled Waters have been identified in the initial CSM as:

1) Leaching of CoC from Made Ground to groundwater in Tidal Flat Deposits
2) Vertical Migration of CoC to the Mercia Mudstone
3) Horizontal Migration of contaminated groundwater to the Cleveland Channel watercourse
4) Migration of CoC in groundwater onto site from off-site sources
5) Migration of CoC in groundwater off site.

An assessment of the potential for soluble contaminants in the Made Ground and slag on the site to impact the Controlled Waters receptors identified in the CSM (on-site surface water and underlying Secondary Aquifers (Tidal Flat Deposits and Mercia Mudstone)) has been undertaken.

At this point only a partial assessment of pollutant linkage 1 has been undertaken as the shallow soils investigation was not intended to assess groundwater or surface water quality at the site. The proposed deep soil and groundwater investigation will assess pollutant linkages 2 to 5.

Concentrations of leachable contaminants from soil leaching tests and groundwater samples have been compared to appropriate Water Quality Standards (WQS).

The WQS chosen are UK Drinking Water Standards (DWS) protective of aquifer water resources, and Environmental Quality Standards (EQS) considered protective of surface waterbody quality. The EQS are for saline waters protective of the Tees Estuary receptor. The WQS are listed in Appendix F.

4.3.2 Soil Leachate

The results of 10No. soil leachate tests were compared to the WQS as shown in Appendix F. Contaminant concentrations that exceeded the WQS are shown in the table below. One of the samples was granular Made Ground and 9No. samples were slag-dominated Made Ground. Samples tested were taken across the site from depths ranging from 0.6 m to 1.2m bgl.

Contaminant	Unit	No. Samples Exceeding	WQS Exceeded		Sample	Concentration
Arsenic	µg/l	1/10	DWS	10	MPA_AUK_TP124_SO_0080	23
Copper	µg/l	8/10	EQS	3.76	MPA_AUK_TP103_SO_0080	12
					MPA_AUK_TP108_SO_0100	9
					MPA_AUK_TP115_SO_0060	4.1
					MPA_AUK_TP111_SO_0120	13
					MPA_AUK_TP117_SO_0060	7.4

Contaminant	Unit	No. Samples Exceeding	WQS Exceeded		Sample	Concentration
					MPA_AUK_TP119_SO_0100	9.9
					MPA_AUK_TP121_SO_0080	9.7
					MPA_AUK_TP123_SO_0100	6.6
Lead	µg/l	5/10	EQS	1.3	MPA_AUK_TP103_SO_0080	2.2
					MPA_AUK_TP111_SO_0120	11
					MPA_AUK_TP121_SO_0080	61
					MPA_AUK_TP123_SO_0100	2.2
					MPA_AUK_TP124_SO_0080	2.6
	µg/l	2/10	DWS	10	MPA_AUK_TP111_SO_0120	11
					MPA_AUK_TP121_SO_0080	61
Mercury	µg/l	1/10	EQS	0.07	MPA_AUK_TP117_SO_0060	0.07
Molybdenum	µg/l	1/10	DWS	70	MPA_AUK_TP121_SO_0080	95
pH	pH units	8/10	EQS	6 – 8.5	MPA_AUK_TP103_SO_0080	11.3
					MPA_AUK_TP108_SO_0100	11.8
					MPA_AUK_TP106_SO_0100	9.6
					MPA_AUK_TP111_SO_0120	12.3
					MPA_AUK_TP115_SO_0060	11.9
					MPA_AUK_TP117_SO_0060	11.4
					MPA_AUK_TP121_SO_0080	12.2
					MPA_AUK_TP123_SO_0100	11.3
Naphthalene	µg/l	1/10	EQS DWS	2	MPA_AUK_TP123_SO_0100	85
Anthracene	µg/l	2/10	EQS	0.1	MPA_AUK_TP106_SO_0100	0.46
					MPA_AUK_TP123_SO_0100	0.46
Fluoranthene	µg/l	9/10	EQS	0.0063	MPA_AUK_TP103_SO_0080	0.01
					MPA_AUK_TP106_SO_0100	2.5
					MPA_AUK_TP111_SO_0120	0.01
					MPA_AUK_TP115_SO_0060	0.09
					MPA_AUK_TP117_SO_0060	0.02
					MPA_AUK_TP119_SO_0100	0.54
					MPA_AUK_TP121_SO_0080	0.01
					MPA_AUK_TP123_SO_0100	0.07
					MPA_AUK_TP124_SO_0080	0.04

Contaminant	Unit	No. Samples Exceeding	WQS Exceeded		Sample	Concentration
Benzo(b)fluoranthene	µg/l	5/10	EQS DWS	0.017 0.025	MPA_AUK_TP106_SO_0100 MPA_AUK_TP115_SO_0060 MPA_AUK_TP119_SO_0100 MPA_AUK_TP123_SO_0100 MPA_AUK_TP124_SO_0080	3.3 0.05 0.02 0.03 0.01
Benzo(a)pyrene	µg/l	5/10	EQS DWS	0.017 0.01	MPA_AUK_TP106_SO_0100 MPA_AUK_TP115_SO_0060 MPA_AUK_TP119_SO_0100 MPA_AUK_TP123_SO_0100 MPA_AUK_TP124_SO_0080	1.0 0.74 0.24 0.03 0.01
Indeno(1,2,3-c,d)pyrene	µg/l	3/10	DWS	0.025	MPA_AUK_TP106_SO_0100 MPA_AUK_TP115_SO_0060 MPA_AUK_TP119_SO_0100	2.1 0.03 0.4
Benzo(g,h,i)perylene	µg/l	6/10	EQS DWS	0.00082 0.025	MPA_AUK_TP106_SO_0100 MPA_AUK_TP115_SO_0060 MPA_AUK_TP117_SO_0060 MPA_AUK_TP119_SO_0100 MPA_AUK_TP123_SO_0100 MPA_AUK_TP124_SO_0080	2.2 0.04 0.02 0.5 0.01 0.02

An exceedance of the EQS for five metals were recorded. Five PAH were measured in excess of DWS with seven measured in excess of EQS.

As the WQS are protective of water quality within the receptor (the water body for EQS or the customer's tap for DWS); direct comparison with soil leachate results is a conservative assessment as it does not take into account dilution and attenuation along the pathway.

The EQS for copper is based on the bioavailable fraction which is likely to be less than the total dissolved concentrations recorded in the results. As not all the copper is likely to be bioavailable the EQS can therefore be regarded as conservative.

Concentrations of CoC measured above MDL for which no GAC was readily available are qualitatively assessed in Section 4.3.3. Discussion of the concentrations of CoC measured in leachate which are in excess of WQS is included in Section 4.3.4.

4.3.3 Qualitative Risk Assessment for Substances in Leachate without WQS

As shown in Appendix F, for several contaminants including some metals (beryllium and magnesium) and inorganics (chloride, and sulphate) WQS are not readily available for comparison. Concentrations of beryllium, were not measured above the laboratory MDL in any of the leachate samples tested. As such, these compounds are not considered to pose a significant risk to identified water resource receptors.

The following compounds did not have readily available GAC and were recorded at concentrations in excess of their MDL: magnesium, sulphate and chloride, these elements and compounds are present naturally in

groundwater. Considering the site setting (close to saline coastal environment) these compounds are not considered to pose a significant risk to water resources.

Given a number of PAHs do not have readily available WQS, assessment of the risk to water resources will be made using PAHs in groundwater that have available WQS. This is considered to be sufficiently protective of water resources.

None of the contaminants without WQS are expected to pose a significant risk to Controlled Waters under a commercial redevelopment scenario and therefore further assessment of the contaminants in shallow soils is not warranted.

4.3.4 Discussion

PAH

Concentrations of PAH have been measured in excess of WQS in the majority of leachate samples. Of the measured concentrations of PAH in excess in leachate, the majority are considered to be marginally in excess of the WQS. Given this, and that PAH are generally of low mobility in the natural environment, the risk to water resources receptors from these contaminants is considered to be low however investigation of the underlying groundwater will need to be completed to confirm this.

Heavy Metals

Of the heavy metals, arsenic, copper, lead, mercury, and molybdenum were measured in excess of the WQS in leachate. Of the measured concentrations of metals in excess in leachate, the majority are considered to be marginally in excess of the WQS within the same order of magnitude. Therefore, the risk to water resources receptors from these contaminants is likely to be low however investigation of the underlying groundwater will need to be completed to confirm this.

4.4 Built Receptors

Significant contamination can pose a risk to subsurface structures and services, where these are in direct contact with soil and/or groundwater. Substances such as dissolved metals, sulphate, cations, phenols and hydrocarbons in high concentrations can adversely affect in-ground materials such as concrete, metal and plastics.

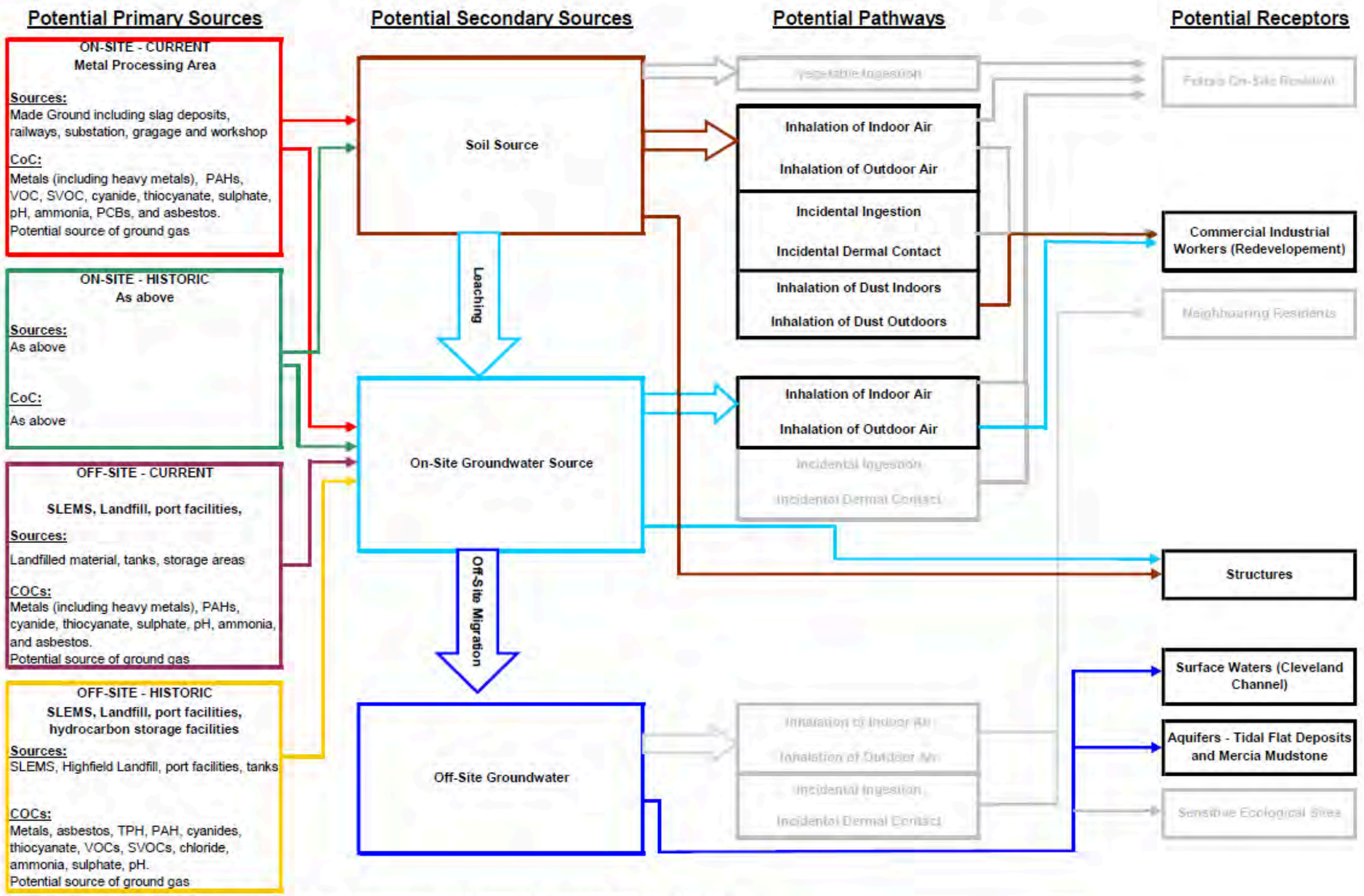
The most sensitive built receptor is generally plastic water supply pipes, which can be affected by permeation of hydrocarbons and organic solvents into the pipe. The available chemical data for soil samples has been reviewed against the UK Water Industry Research (UKWIR) criteria to provide an indication of the potential acceptability of polyethylene (PE) pipes in brownfield land (Water UK, 2014), although an exact comparison is not possible due to differences in the determinand suites tested. Concentrations of the chemicals measured in the soil samples collected from the site have not been identified in excess of the UKWIR criteria however it is noted the Made Ground at the site can be alkaline (up to a pH of 12). Additional analysis of soil along any proposed route of water supply pipes is likely to be required to validate the acceptability of PE water supply pipes, alternatively barrier pipe or similar could be used.

Potential pollutant linkage E (attack on subsurface structures) cannot be discounted at this stage and appropriate mitigation measures may be required, these will be dependent on the redevelopment scenario and may require further assessment to define.

5 Updated Conceptual Site Model

An updated CSM has been developed, using the findings of the above assessments, and is presented below as Figure 5. Pollutant linkages that have been shown to be inactive or not a significant risk have been removed.

Figure 5
Outline Conceptual Site Model - Commercial Industrial End Use



6 Conclusions

This report has used information obtained from the recent ground investigation to assess the potential contamination risks to human health, Controlled Waters, ecological receptors and built property. The assessment has been undertaken based on a future generic commercial end use. Based upon this assessment of data, the CSM has been updated to identify the potential pollutant linkages considered to be complete (previous page).

Heavy metals have been recorded in soil and dissolved in soil leachate samples across the site. These are likely associated with the slag within the Made Ground. The probable source is historical placement of material from the steelmaking process.

6.1 Human Health Risk

Potential risks to human health via intake of a range of contaminants from shallow soils (Made Ground including slag materials) were assessed using GAC. None of the contaminants for which GAC are available exceeded the criteria and therefore no unacceptable risks have been identified from contact with or ingestion of soils on the site. Soil pH was noted to be strongly basic / alkaline. Contaminants without GACs have been qualitatively reviewed and no potentially significant risks have been identified. However, risks to human health from vapour intrusion of contaminants in groundwater has not been assessed as groundwater quality has not been investigated at this point.

Quantifiable asbestos was recorded in 3 out of 32 samples of Made Ground across the site (0.002 - 0.003%). This was associated with obvious demolition material within Made Ground at the site in only one case. Asbestos fibres in shallow soils in areas without buildings or hardstanding has the potential to become airborne and available for inhalation, particularly during construction, posing chronic risks to human health.

Additional assessment may be required dependent on the redevelopment scenario to further delineate the presence of asbestos on the site and determine necessary mitigation measures. It is likely that a clean cover system in areas of soft landscaping can be utilised to mitigate the risk to site occupiers and neighbouring land users. During redevelopment, good construction practice such as minimising handling of asbestos-contaminated soils, damping down and appropriate Personal Protective Equipment (PPE) may be sufficient to mitigate the risk to construction workers, but the works should be carried out with due consideration to the Control of Asbestos Regulations (2012).

Soil containing more than 0.1% m/m asbestos, if disposed of off-site, may be classified as hazardous waste and attract significantly higher disposal costs. Additional testing would be required to confirm the quantity of asbestos and delineate any areas above the threshold.

6.2 Controlled Waters

Several exceedances of Water Quality Standards (WQS) were recorded in soil leachate samples from Made Ground. As assessment of groundwater and surface water quality has not been conducted at this stage the significance of the potential pollutant linkages identified for Controlled Waters cannot be assessed.

6.3 Flood Risk

The Wood “Flood Risk Assessment and Drainage Strategy Flood Risk Assessment and Drainage Strategy” (Ref. 41825-WOOD-XX-XX-RP-OW-0001_A_P01) concluded that the potential import of up to 500mm mudstone onto the site did not increase the surface water flood risk.

The proposed planning application “*Demolition of existing buildings/ structures and engineering operations associated with ground remediation and preparation of land for development*” is assumed to comprise the excavation and crushing of hardstanding and other impermeable obstructions within the Made Ground and their backfill within the excavation. As such, Arcadis considers that following removal of hardstanding this approach will not decrease surface water infiltration rates and therefore the risk or surface water flooding both on and off-site will likely be no higher than that identified by Wood.. The proposed works are also unlikely to significantly alter the surface run off and infiltration from the site into the adjoining surface water features.

6.4 Recommendations

1. The proposed planning permission is for ""*Demolition of existing buildings/ structures and engineering operations associated with ground remediation and preparation of land for development*". It is recommended that a watching brief is in place for environmental; contamination.
2. Assessment of deep soils, ground and surface water should be undertaken prior to redevelopment to further assess the risks to Controlled Waters at the site, and the risks to human health from the vapour intrusion pathway.
3. Following the collection of additional data, further assessment of the risk to identified surface receptors from concentrations of CoC identified in groundwater should be undertaken.
4. Prior to redevelopment a remediation options appraisal should be carried out for the loose asbestos fibres identified in the Made Ground on the site. Additional data collection may be needed to support the associated risk assessment/remediation design.
5. Depending on the redevelopment scenario further ground investigation including ground gas monitoring of shallow soils should carried out prior to redevelopment to quantify the ground gas risk on the site in the context of the proposed layout and design.

APPENDIX A

Figures

Legend

STDC Shapefile Data

- Rail Track
- Tanks

Redline

- Metals Recovery Area

Notes:

REPRODUCED FROM OS MASTERMAP BY PERMISSION OF ORDNANCE SURVEY® ON BEHALF OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE. © CROWN COPYRIGHT. ALL RIGHTS RESERVED. LICENCE NUMBER GD 100024393.

CONTACT ARCADIS IN CASE OF ANY QUERIES.

Not shown PAOC - Made Ground

N

Title: MPA - Potential Areas of Concern (PAOC)

Site:
Redcar Steelworks - MPA

Client:
South Tees Developement Corporation

Project:
37774100

Figure 3

Date: 3/08/2020
Drawn By: JALM
DRG No: 10035117-AUK-XX-XX-DR-ZZ-0125-01-MPA_PAOC

ARCADIS

Legend

Redline

Metals Recovery Area

Hatching Shows Artificial Ground

Notes:

CONTACT ARCADIS IN CASE OF ANY QUERIES.

Title: MPA - Anticipated Geology

Site:
Redcar Steelworks - MPA

Client:
South Tees Developement Corporation

Project: 10035117	**Figure 2**

Date: 01/04/2020
Drawn By: JALM
DRG No: 10035117-AUK-XX-XX-DR-ZZ-0126-01-MPA_Geology

ARCADIS

Legend

Site Boundary

Metals Processing Area

Notes:

CONTACT ARCADIS IN CASE OF ANY QUERIES.

N

Title: MPA - Site Location Plan

Site:
Redcar Steelworks - MPA

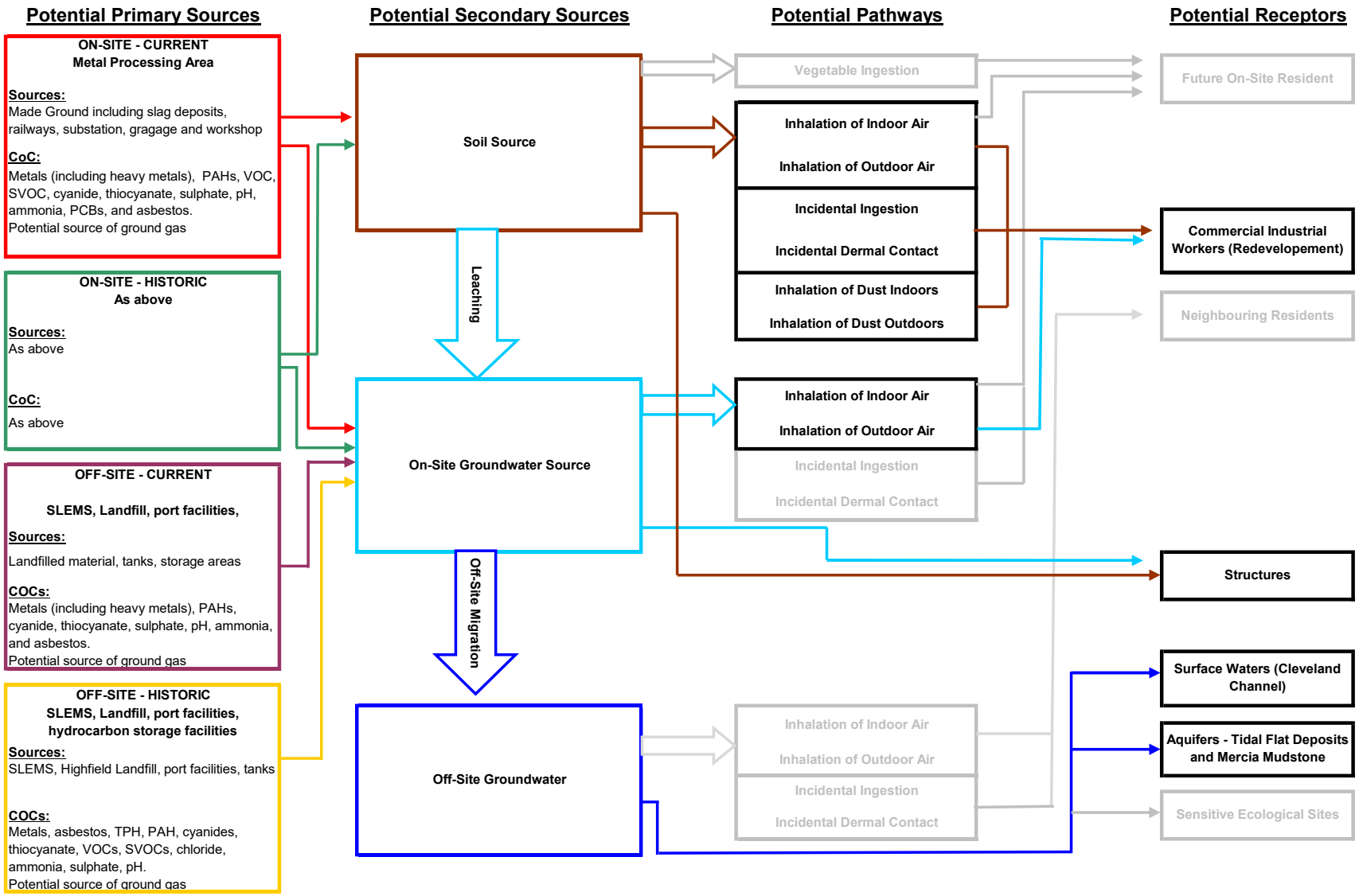
Client:
South Tees Developement Corporation

Project: 10035117	**Figure 1**

Date: 07/08/2020
Drawn By: JALM
DRG No: 10035117-AUK-XX-XX-DR-ZZ-0127-01-MPA_SLP

ARCADIS

Figure 4
Outline Conceptual Site Model - Commercial Industrial End Use



Key: Pollutant linkage not considered to present a significant level of risk

APPENDIX B

Study Limitations

IMPORTANT: This section should be read before reliance is placed on any of the information, opinions, advice, recommendations or conclusions contained in this report.

1. This report has been prepared by Arcadis UK Ltd (Arcadis), with all reasonable skill, care and diligence within the terms of the Appointment and with the resources and manpower agreed with **STDC** (the 'Client'). Arcadis does not accept responsibility for any matters outside the agreed scope.

2. This report has been prepared for the sole benefit of the Client unless agreed otherwise in writing.

3. Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. Arcadis are unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have unpublished, more stringent objectives. Further work may be required by these parties.

4. All work carried out in preparing this report has used, and is based on, Arcadis' professional knowledge and understanding of current relevant legislation. Changes in legislation or regulatory guidance may cause the opinion or advice contained in this report to become inappropriate or incorrect. In giving opinions and advice, pending changes in legislation, of which Arcadis is aware, have been considered. Following delivery of the report, Arcadis have no obligation to advise the Client or any other party of such changes or their repercussions.

5. This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report.

6. Whilst this report and the opinions made are correct to the best of Arcadis' belief, Arcadis cannot guarantee the accuracy or completeness of any information provided by third parties.

7. This report has been prepared based on the information reasonably available during the project programme. All information relevant to the scope may not have been received.

8. This report refers, within the limitations stated, to the condition of the Site at the time of the inspections. No warranty is given as to the possibility of changes in the condition of the Site since the time of the investigation.

9. The content of this report represents the professional opinion of experienced environmental consultants. Arcadis does not provide specialist legal or other professional advice. The advice of other professionals may be required.

10. Where intrusive investigation techniques have been employed they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. In some cases the investigation is further limited by site operations, underground obstructions and above ground structures. Unless otherwise stated, areas beyond the boundary of the site have not been investigated.

11. If below ground intrusive investigations have been conducted as part of the scope, service tracing for safe location of exploratory holes has been carried out. The location of underground services shown on any drawing in this report has been determined by visual observations and electromagnetic techniques. No guarantee can be given that all services have been identified. Additional services, structures or other below ground obstructions, not indicated on the drawing, may be present on Site.

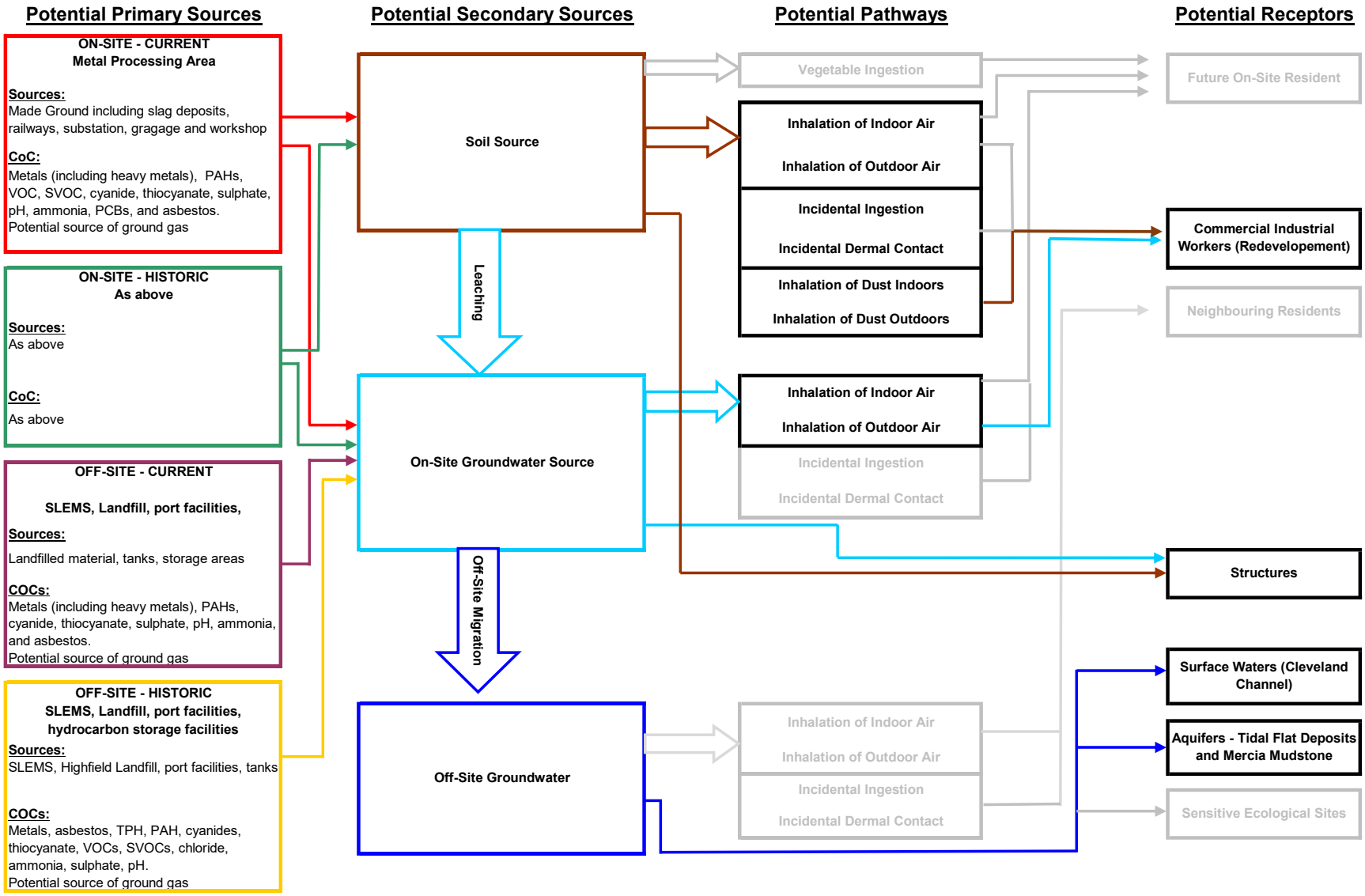
12. Unless otherwise stated the report provides no comment on the nature of building materials,

operational integrity of the facility or on any regulatory compliance issue

APPENDIX C

AEG Data - 4291 Metal Processing Area Shallow Soils Investigation (Final Report)

Figure 5
Outline Conceptual Site Model - Commercial Industrial End Use



Key: Pollutant linkage not considered to present a significant level of risk

ARCADIS

METAL PROCESSING AREA
SHALLOW SOILS INVESTIGATION

Final Factual Report
(Rev.00)

Allied Exploration & Geotechnics Ltd.

Contract Number: 4291
Client: South Tees Development Corporation
Consulting Engineer: Arcadis

Date: November 2020

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ALLIED EXPLORATION & GEOTECHNICS LIMITED

REPORT CONTROL SHEET

Contract Details

Contract Title	**Metal Processing Area Shallow Soils Investigation**
Contract Number	4291
Location	**Former Redcar Steelworks, Redcar**
National Grid Reference	NZ 546 227

Report Details

Report Status	Final (Rev.00)		
Report Type	**Factual**		
Volume Number	**1**	**Of**	**1**
Copy Number	**PDF**	**Of**	**PDF**
Report Recipient	Jonathan Miles	Arcadis	

Client/Consultant Engineer Details

Client	Consultant Engineer
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Signed & Approved
On Behalf of Allied Exploration & Geotechnics Limited

Reports Engineer	**Approved:**	**Date:**
Laura Clarke BSc (Hons).		13/11/2020
Technical Manager	**Approved:**	**Date:**
Kerry Wade BSc (Hons), MSc, FGS		13/11/2020
Managing Director	**Approved:**	**Date:**
Nick Vater BSc (Hons), MSc, CGeol, EurGeol, FGS	pp	13/11/2020

METAL PROCESSING AREA SHALLOW SOILS INVESTIGATION

Contents Page

FIELD DATA ENCLOSURES:

***IN-SITU* TESTING ENCLOSURES:**

LABORATORY ENCLOSURES:

APPENDICES:

1. INTRODUCTION

The site works were commissioned in order to determine the ground and groundwater conditions on site prior to the proposed works at the Metals Processing Area of Redcar Steelworks, Redcar.

Allied Exploration & Geotechnics Limited (AEG) were contracted by South Tees Development Corporation with Arcadis acting in the capacity of Consulting Engineer to perform a ground investigation at this site in order to provide information on the subsurface ground and groundwater conditions as well as to obtain samples for geotechnical and specialist chemical testing.

1.1 Scope of Works

The investigation works consisted of the following main elements:

- Thirty one machine excavated trial pits.
- Associated sampling.
- *In-situ* Plate Load Testing.

Site work was carried out between the 6th and 16th July 2020 with subsequent laboratory testing and reporting thereafter. A factual report only was requested.

The comments and opinions expressed in this report are based on the ground conditions encountered during the site work and on the results of tests carried out in the field and in the laboratory. There may, however, be special conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report.

2. THE SITE

2.1 Location

The National Grid Reference of the approximate centre of the site is NZ 546 227. This can be found on Ordnance Survey 1:50,000 Sheet Number 93 (Middlesbrough, Darlington & Hartlepool). Part of this sheet is reproduced as Figure 1, the Site Location Plan.

The site is located approximately 1.10km south of Teesport Container Terminal 1 and 1.90km north east of South Bank train station.

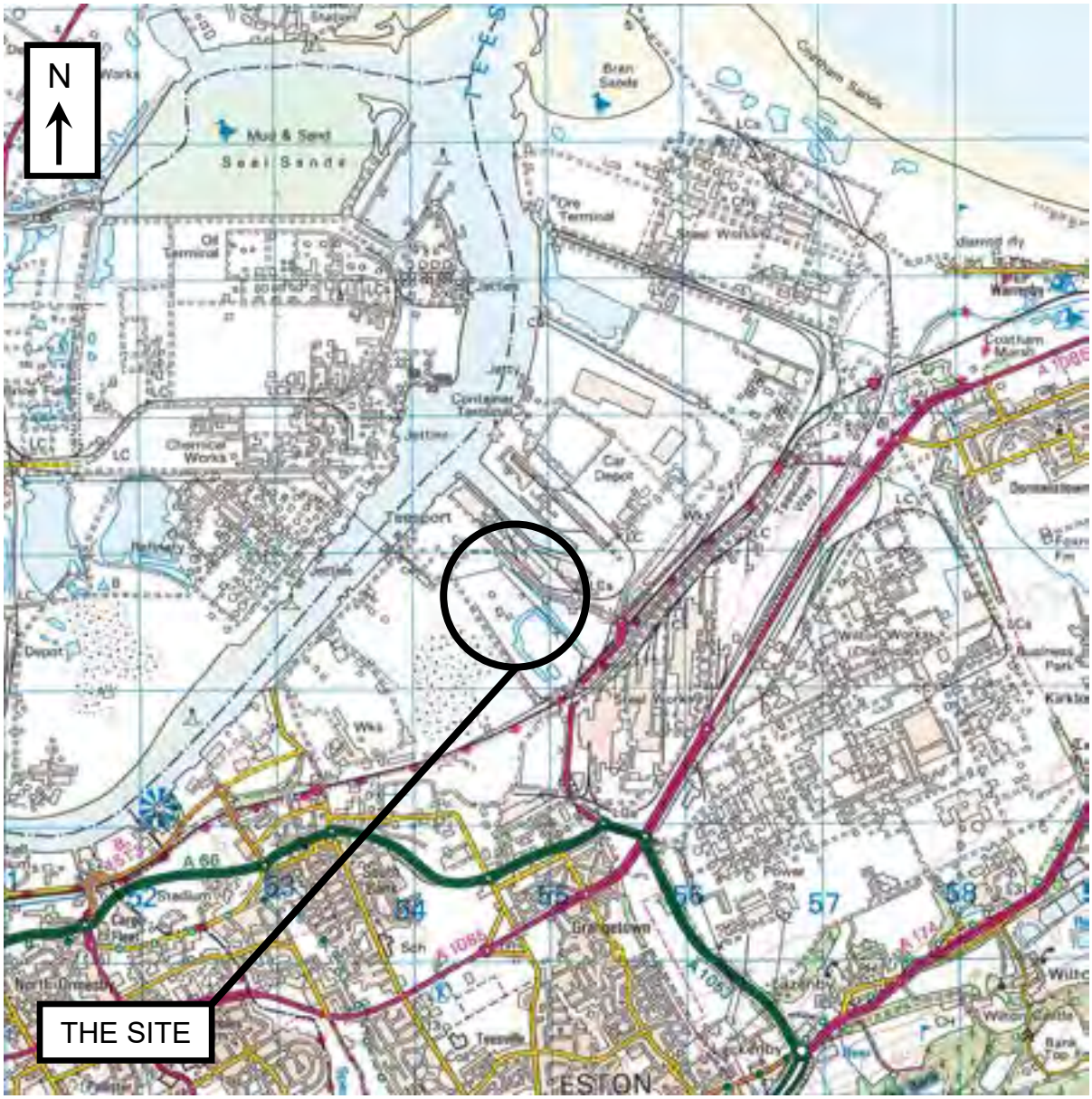

Figure 1: Site Location Plan

2.2 Site Description and Topography

The site is bound to the north and west by and access road that connects areas of the former Redcar Steelworks site. A dirt track runs along the southern site boundary, beyond which a water course runs parallel to this path, and is surrounded by some greenery. To the east, the site is bound by an infrastructure corridor comprising above ground pipework and Tees Dock Road, beyond which lies a Teesport Container Terminal. The surrounding land is principally industrial land related to port activities on the River Tees (which runs approximately 400m northwest of the site). A railway line runs northeast-southwest approximately 600m south of the site boundary.

3. SITE OPERATIONS

3.1 General

All exploratory hole work, associated sampling, *in-situ* testing and logging was carried out in accordance with techniques outlined in Table 1, as appropriate; at positions as near as practicable to those supplied by the Consulting Engineer. These are shown on the Exploratory Hole Location Plan, Field Data Enclosure 1.

Reference Code Number	Title
BS 1377:1990	Methods of Test for Soils for Civil Engineering Purposes (where not in contravention or superseded by Eurocode references)
BS 5930:2015	Code of Practice for Ground Investigation (where not in contravention or superseded by Eurocode references)
BS EN ISO 14688-1:2018 & 14688-2:2018	Identification and Classification of Soil
BS 10175:2011+A2:2017	Investigation of Potentially Contaminated Sites

Table 1: British Standard Reference Code Number

The depths of all trial pits, descriptions of the material encountered, details of any groundwater encountered, samples taken and *in-situ* testing carried out together with any other relevant information can be found on the Trial Pit Records, Field Data Enclosure 2. A key to all symbols and abbreviations used throughout the report is included in the Key Sheets.

In accordance with the Site Investigation Steering Group publication “Guidelines for the Safe Investigation by Drilling of Landfills and Contaminated Land” the site was classified YELLOW.

The primary purpose of ground investigation exploratory holes is to probe the stratified sequences of soil and/or rock. From the results of these probings no conclusion should be drawn concerning the presence of, size, lithological nature, and numbers per unit volume of ground cobbles and boulders in soil types such as glacial till (boulder clay). Refer to the Key Sheets for further information.

3.2 Health & Safety Considerations: Services

Before the commencement of any exploratory hole a search for underground services was conducted as prescribed in HSE publication '*Avoiding Underground Services (HSG47)*' and in accordance with in-house internal safety procedure AEG-14.

Service plans were provided by the Client and were consulted by Hall Construction representatives prior to using a service locating device (such as a Cable Avoidance Tool or C.A.T.) to scan a working area around the proposed exploratory hole location. Where no services were indicated they issued AEG with a '*Permit-to-Work*' form was issued by the investigation supervisor and, with the exception of trial pits, the position was commenced with a hand excavated inspection pit. The inspection pit was also scanned during the excavation procedure. It should be noted that the digging of an inspection pit only confirms or guards against the possible presence of underground public utility services within the excavated pit. Where no services were indicated by the scanning procedure or inspection pit the exploratory hole was commenced in accordance with the Contract Specification.

Where services were located or there was reasonable belief that they were present, the position was relocated in agreement with the Client. Details of any services uncovered/located during this investigation are given in Table 2.

Exploratory Hole Number	Type of Service	Orientation & Depth (size where indicated)	Status (Damaged/Undamaged)	Additional Remarks
MPA_AUK_TP103	Black cable	270° at 1.40m BGL (25mm diameter)	Redundant/damaged	None
MPA_AUK_TP105	Black cable	270° at 1.40m BGL (25mm diameter)	Redundant/damaged	None
MPA_AUK_TP113	Relic bedding for a cable	1.20m BGL	N/A	Engineer notes fine to medium sand.
MPA_AUK_TP117	2 No. pipe sections	270° at 1.00m BGL (Both 50mm diameter)	Redundant/damaged	Pipes have been previously backfilled/tipped.
MPA_AUK_TP127	Electric cable	270° at 1.60m BGL (75mm diameter)	Redundant/damaged	None
MPA_AUK_TP128	Electric cable	270° at 1.60m BGL (75mm diameter)	Redundant/damaged	None

Table 2: Services Encountered

3.3 Exploratory Holes: Mechanically Excavated Trial Pits

Thirty one trial pits were mechanically excavated using a JCB 360 Tracked excavator to a maximum depth of 4.50m BGL. The Trial Pit Records are presented along with a Summary Table detailing any relevant remarks as Field Data Enclosure 2.

3.4 Samples

Representative samples of soil were obtained from the trial pits and were taken to the laboratory for selected geotechnical and specialist chemical testing.

Environmental samples were taken in accordance with the contract specification during the investigation using an approved selection of container types in order to suit the encountered material properties and

designated laboratory analytical parameters. Full chain of custody procedures were in place post sampling and during the transportation stage to the nominated specialist chemical laboratory. Environmental samples were administered appropriately following the best practice guidance provided in the contract specification.

3.5 Groundwater

The comments on groundwater conditions are based on the observations made at the time of investigation. It should be noted that groundwater levels may vary due to seasonal and other effects.

Groundwater was encountered in one trial pit (MPA_AKU_TP111) during the site works operation. Where groundwater observations were made details are given on the relevant Trial Pit Record and in greater detail (collectively in tabulated format) as Field Data Enclosure 3: Groundwater Observations Made at the Time of Site Works.

3.6 Operative Observations: Potential Contamination

For the purposes of determining the condition of the site, with regard to human health and environmental issues, reference should specifically be made to any specialist chemical testing undertaken as part of the investigation scheme, as well as any supporting desk study and risk assessment documentation. The information given herein collates the observations made by the operatives involved in the investigation only and comments that have been indicated on the engineering records.

Where there was potential evidence of contamination, principally as a consequence of olfactory and visual identification, information is provided in Table 3.

Exploratory Hole Number	Occurrence (*in-situ*/surface/ laboratory sample)	Visual / Olfactory / Laboratory Testing	Depth (m BGL)	Occurrence Type	Additional Remarks
MPA_AUK_TP128	*In-situ*	Olfactory	0.00-1.00	Slight hydrocarbon odour noted	None

Table 3: Potential Contamination Encountered

It should be stressed that the information provided herein is subjective, as it is based on the perceptions of individuals and not specialists routinely involved in the chemical determination of contaminated residues, liquors, vapours or solid contaminants.

3.7 Surveying

The investigation positions were surveyed after completion of site by Hall Construction and AEG representatives. These positions have been subsequently plotted in AutoCAD® software and are shown on the Exploratory Hole Location Plan, Field Data Enclosure 1.

4. *IN-SITU* TESTING

4.1 General

In-situ testing as specified by the Consulting Engineer was carried out in selected trial pits in accordance with techniques outlined in the relevant British Standard and/or AEG Quality Procedure. The results are presented in the *In-situ* Testing Enclosures with a number of the test results summarised at the relevant depth on the Trial Pit Records.

4.2 Plate Load Testing

Three plate load testing was carried out at nominated locations within the investigated area. The tests were undertaken on three mounds of material present on site, comprising BOS Oxide (PLT-01 (BO)), mixed BOS Oxide and mudstone (PLT-02 (BO&M)) and mudstone (PLT-03 (M)). Results from this work are presented in *In-situ* Testing Enclosure 1.

5. LABORATORY TESTING

5.1 General

Laboratory testing as scheduled by the Consulting Engineer was carried out on selected samples in accordance with techniques outlined in BS 1377:1990, AEG Laboratory Quality Procedures or other appropriate standard as quoted.

5.2 Geotechnical Testing

The results are presented in the Laboratory Enclosures with an outline list of the procedures undertaken given in Table 4.

Test	Procedure
Moisture Content	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)
Plasticity Index and Moisture Content	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)
Determination of Particle Density	BS 1377 Part 2 1990
Particle Size Distribution Sieving	BS 1377 Part 2 1990
Particle Size Distribution Sedimentation	BS 1377 Part 2 1990
Determination of Calorific Value, Total Sulphur, Sulphate and pH (Tested externally)	See External Laboratory Certificates
Determination of Dry Density/Moisture Content Relationship	BS 1377 Part 4 1990
Determination of California Bearing Ratio	BS 1377 Part 4 1990
Determination of Permeability in a Triaxial Cell	BS 1377 Part 6 1990
Determination of In-Situ Density Core Cutter	BS1377 Part 9 1990
Slag Analysis (Tested externally)	-

Table 4: Geotechnical Testing

5.3 Specialist Chemical Testing

Selected samples have been submitted for chemical analysis as specified by the Consulting Engineer, conducted under a subcontract arrangement with Derwentside Environmental Testing Services (DETS). The results of this testing are presented as Appendix I.

5.4 Laboratory Identified Asbestos

Selected samples were analysed for asbestos content as specified by the Consulting Engineer. Any identified asbestos is presented in Table 5 which has been summarised from specialist chemical testing results (see Appendix I for further details).

Exploratory Hole Number	Occurrence	Depth (m BGL)	Occurrence Type	Additional Remarks
MPA_AUK_TP101	Laboratory Sample	3.50	White asbestos	Small bundles of Chrysotile present
MPA_AUK_TP102A	Laboratory Sample	1.00	White asbestos	Large bundle of Chrysotile present
MPA_AUK_TP130	Laboratory Sample	0.60	White asbestos	Small Bundles of Chrysotile present

Table 8: Laboratory Identified Asbestos

KEY SHEETS

Key Sheets

Allied Exploration and Geotechnics Limited
Key Sheets

INTRODUCTION

The following explanatory notes define the terminologies, abbreviations and symbols pertaining to each individual column or section of the Exploratory Hole records. 'Exploratory Hole' is used as a general term in this report to comprise borehole, drillhole, and trial pit. All exploratory hole records have been produced using ' gINT®', which is an integrated software environment for the storage and manipulation of subsurface data.

The primary purpose of ground investigation exploratory holes is to probe the stratified sequences of soil and/or rock. From the results of these probings no conclusion should be drawn concerning the presence of, size, lithological nature, and numbers per unit volume of ground cobbles and boulders in soil types such as glacial till (boulder clay). With respect to rotary coring, driller's records and observations of the recovered core are used to determine any zones of no recovery (core loss). These zones are based on the interpretation of the logging engineer and are therefore potentially subjective. In addition, where relevant, every effort is made to highlight material/zones that may relate to suspected old workings. However, it should be noted that this is not straightforward (especially without detailed information regarding anticipated subsurface conditions) and therefore no guarantee can be made with regards to the accuracy of the interpretation of the recovered core.

INFORMATION COMMON TO ALL EXPLORATORY HOLE RECORDS

Status Box

The status box in the top right hand corner of each exploratory hole record gives the status of each individual record i.e. PRELIM1, PRELIM2, PRELIM3 FINAL etc. The date shown relates to the last instance the data was revised. This information is for AEG Quality Assurance only.

Exploratory Hole No

The identity number used throughout the report.

Project

The ground investigation project name. Occasionally the project name may be shortened or abbreviated due to string length restraints imposed by the gINT® computer programme.

Client

Client's name responsible for funding the ground investigation project. The Client's name may be shortened or abbreviated due to string length restraints imposed by the gINT® computer programme.

Location

The exploratory hole position given as either national grid co-ordinates, local grid if specified, or a reference name normally pertaining to the area of investigation.

Method (Equipment)

Represents the drilling, excavation or boring method(s) or equipment used.

Ground Level (m(AOD))

The precise ground level in metres above Ordnance Datum at the exploratory hole location from which the reduced level for each stratigraphic boundary is calculated.

Date

The date relating to the start of the exploratory hole excavation.

Sheet

The sheet number and total number of sheets for the particular record.

Checked By

Printed signature of the person who has carried out the technical quality check on the log.

Logged By

The name of the engineer who has carried out the logging of the exploratory hole.

Contract No.

The Allied Exploration & Geotechnics Limited reference number for the project.

Allied Exploration and Geotechnics Limited
Key Sheets

INFORMATION RELEVANT TO BOREHOLE AND WINDOW/WINDOWLESS SAMPLE HOLE RECORDS

Sample & Tests Columns

Depth	The depth over which a sample or test is taken is shown in depth column of the exploratory hole record in a "from...to" format.
Type No	Indicates the type of sample/test and number given by the driller.
Test Result	Result of the test given in the applicable units.

Water Column

Water Strike	Level of groundwater strike within an exploratory hole. The symbol 1▼ denotes a water strike and is suffixed with a number, which indicates the strike order. The corresponding unfilled symbol ▽ is the depth the strike rose to.
Seepage	Groundwater seepage within an exploratory hole is denoted by the symbol.

Strata Columns

Reduced Level	The corresponding reduced level of each soil or rock boundary in metres Ordnance Datum.
Legend	A graphical representation of the materials encountered using BS 5930:1999 Amendment No.2 (Aug 2010) recommended symbols for soil and rock.
Depth (Thickness)	The depth below ground level of each soil or rock boundary in metres and the thickness of each individual stratigraphic unit (given in brackets).
Description	Engineering description of each individual soil or rock type follows recommendations outlined in Section 6 of BS 5930:1999 Amendment No.2 (Aug 2010) with the following implementation:

1 The amendment of section 6 incorporates the guidance indicated in BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004 and BS EN ISO 14689-1:2003 European Standard with particular emphasis on current UK practice.

2 Supplementary laboratory or in-situ assessed measurements of undrained strength are provided where applicable information is available in parenthesis in accordance with clause 41.3.2 BS 5930:1999 Amendment No.2 (Aug 2010) after the field strength determined consistency. The description based measurement table indicating the quantitative undrained strength classification divisions is provided in Key Sheets Table 1.

Term based on measurement	**Undrained strength classification definition cu, in kPa** (from BS EN ISO 14688-2:2004, 5.3, Table 5)
Extremely low	<10
Very low	10-20
Low	20-40
Medium	40-75
High	75-150
Very High	150-300
Extremely High	300-600

KEY SHEETS TABLE 1

3 Cobble and boulder content is expressed in accordance with the terms provided in EN ISO 14688-2: 2004 where visually identified in trial pit excavations, or inferred/recovered during the drilling operations. The assessment of frequency and spatial occurrence of coarse and very coarse rock material should not be considered as precise, but only an indicator or estimate of the potential conditions. It should be noted that the recovery of coarse or very coarse particles in boreholes is dependent on the limitations imposed by the casing diameter. The terminology used is outlined in Key Sheets Table 2.

Fraction	Percent by Mass	Term
Boulders	<5	Low boulder content
	5 to 20	Medium boulder content
	>20	High boulder content
Cobbles	<10	Low cobble content
	10 to 20	Medium cobble content
	>20	High cobble content

KEY SHEETS TABLE 2

4 Rock Strength based on assessed field or measured unconfined compressive strength follows the classification scheme given in clause 44.2.1 BS5930:1999 Amendment No.2 (Aug 2010) as outlined in Key Sheets Table 3.

Term for use in field or based on measurement	Definition for field use	Definition on basis of Unconfined Compressive Strength measurement (MPa)	*Old Classification of rock strength: Terminology (Strength Range MPa)*	*Old Classification of rock strength: Determination Method*
Extremely weak	Can be indented by thumbnail. Gravel sized lumps crush between finger and thumb.	0.6-1.0	*Very Weak (<1.25)*	*Lumps can be crushed between fingers*
Very weak	Crumbles under firm blows with point of geological hammer. Can be peeled by a pocket knife.	1-5	*Weak (1.25 – 5)*	*Lumps can be broken with heavy hand pressure*
Weak	Can be peeled by a pocket knife with difficulty. Shallow indentations made by firm blow with the point of geological hammer.	5-25	*Moderately Weak (5-12.50)*	*This slab can be broken with heavy pressure*
Medium Strong	Cannot be scraped with pocket knife. Can be fractured with a single firm blow of geological hammer.	25-50	*Moderately Strong (12.50-50)*	*Rock can be broken in the hand with a hammer*
Strong	Requires more than one blow of geological hammer to fracture.	50-100	*Strong (50-100)*	*Rock can be broken on a flat surface using a hammer*
Very Strong	Requires many blows of geological hammer to fracture.	100-250	*Very Strong (100-200)*	*Rock chipped by blows with a hammer*
Extremely strong	Can only be chipped with geological hammer.	>250	*Extremely Strong (>200)*	*Rock rings when hit with a hammer*
Based on BS EN ISO 14689-1:2003 4.2.7, Table 5			*BS5930: 1999 – Section 6 (Superseded Version)*	

KEY SHEETS TABLE 3

5 Where 'rock weathering classification' can be applied it is 'Approach 4' which will be used. If any other approach is used the factual text of the report will provide details of the applicable specific approach. (Ref.: Figure 19, p143, BS 5930:1999 Amendment No.2 (Aug 2010)). An outline of the 'Approach 4' rock weathering classification scheme is provided as Key Sheets Table 4.

APPROACH 4 CLASSIFICATION INCORPORATING MATERIAL AND MASS FEATURES		
Class	**Classifier**	**Typical characteristics**
A	Unweathered	Original strength, colour, fracture spacing
B	Partially weathered	Slightly reduced strength, slightly closer fracture spacing, weathering penetrating in from fractures, brown oxidation
C	Distinctly weathered	Further weathered, much closer fracture spacing grey reduction
D	Destructured	Greatly weakened, mottled, ordered lithorelics in matrix becoming weakened and disordered, bedding disturbed.
E	Residual or reworked	Matrix with occasional altered random or 'apparent' lithorelics, bedding destroyed. Classed as reworked when foreign inclusions are present as a result of transportation.

KEY SHEETS TABLE 4

Instrument/Backfill Column

A graphical representation of backfill material or instrumentation detail using graphic legends. Its placement in the column is relative to depth in metres and corresponds to the exploratory hole in scale.

Boring Progress and Water Observations Columns

This section provides information on each day's production as a daily log.

Date	Date of shift.
Depth	Depth of hole at the start of the shift.
Casing	Casing's depth at the start of the shift.
Casing Dia	Casing's diameter at the start of the shift.
Water Depth	Water level within the borehole at the start and end of shift.

Chiselling Columns

Indicates where hard strata occurred in the borehole and breaking out was carried out to advance the borehole.

From	The depth commenced.
To	The depth finished.
Hours	The time spent for breaking out.

Water Added Columns

Indicates the depth range where water was added to the borehole to facilitate boring or to prevent stress relief disturbance "blowing/boiling" in granular soils.

From	Depth in metres from where water was added.
To	Depth in metres to where water was added.

General Remarks

Any remarks believed to be relevant to the exploratory hole.

INFORMATION RELEVANT TO PIT/TRENCH RECORDS

The pit/trench records follow the same format as the borehole and window/windowless sample hole records for the Samples & Tests, Water and Strata columns. However, in addition to these there are the following:

Plan

A schematic plan view of the pit showing its excavated dimensions together with its orientation, given as a compass bearing to magnetic north.

Groundwater

Notes on water bearing horizons.

Stability

The engineer's comments outlining the stability of the sides during pit excavation.

General Remarks

The engineer's comments of any other information relevant to construction of the pit.

Additional Information

An indication if a sketch and/or photographs accompany the record.

Underground Services

Depth	Depth service was encountered.
Orientation	Orientation given as a compass bearing to magnetic north.
Type	Type of service encountered.
Diameter	Diameter of service encountered.
Condition	Condition the service encountered was noticed in.

INFORMATION RELEVANT TO DRILLHOLE RECORDS AND ROTARY CONTINUATION

Run Details Columns

Depth	Each drill run is highlighted by a horizontal line with the top and bottom depths shown in metres. Core diameter (C Dia) is presented also within each run.
TCR (SCR) RQD	Information provided on the total core recovery, solid core recovery and rock quality designation. Refer to Abbreviations for further details.
Fracture Index	Information given relating to the fracture index of the rock.

Strata Columns

As the strata columns for borehole and window/windowless sample hole records except for description which is as follows:

Discontinuities Detail	Information on core discontinuities, localised variations in weathering, lithology, strength and structure follows recommendations outlined in Section 6 BS 5930:1999 Amendment No.2 (Aug 2010):Clause 44.
Main	Engineering description of each individual soil or rock type follows recommendations outlined in Section 6 of BS 5930:1999 Amendment No.2 (Aug 2010).

Instrument/Backfill Column

A graphical representation of backfill material or instrumentation detail using graphic legends. Its placement in the column is relative to depth in metres and corresponds to the exploratory hole in scale.

Drilling Progress and Water Observations Columns

Date	Date of shift.
Depth	Depth of hole at the start of the shift.
Casing	Casing's depth at the start of the shift.
Water Strike	Depth at which water was encountered.
Water Standing	Depth at which water in the hole levelled off.
Water Remarks	Any remarks believed to be relevant to the water e.g. Artesian.

Standard Penetration Test

Depth	The depth commenced.
Type	Type of standard penetration test (SPT).
Result	Result of SPT.

Flush

From	The depth commenced.
To	The depth finished.
Type	Details of the type of flush used. A = Air, F = Foam, W = Water and Pol = Polymer.
Returns	An indication of the percentage of the returned flush material.

General Remarks

Any remarks believed to be relevant to the exploratory hole.

Allied Exploration and Geotechnics Limited
Key Sheets

SAMPLES

B	Bulk disturbed sample.
ES	Environmental soil sample.
EW	Environmental water sample.
G	Gas sample.
J	Small disturbed sample.
LB	Large bulk disturbed sample.
P	Piston sample.
P*	An attempted but failed undisturbed piston sample.
U	Undisturbed sample.
U*	An attempted but failed general purpose undisturbed sample.
$U_{(ss)}$	Sample has been subsampled.
$ES_{(U)}$	Brackets following a sample denotes a subsample. The sample information within the brackets is the origin of the subsample.
W	Water sample.

IN-SITU TESTS

CBR	California Bearing Ratio mould sample or test.
HSV	In-situ hand shear vane.
HSV*	An attempted but failed in-situ hand shear vane.
HSV result of e.g 80(20)kPa	Denotes average HSV peak result followed by average HSV residual result (in brackets).
HP	Hand penetrometer test.
K (F)	Falling head permeability test.
K (R)	Rising head permeability test.
K (C)	Constant head permeability test.
K (P)	Packer permeability test.
PT	Pressuremeter test.
PID	Photo ionisation detector test.
FID	Flame ionisation detector test.
S	Standard Penetration Test (SPT) using the split barrel sampler (shoe). The corresponding uncorrected 'N' value is given in the test result column with more detailed information provided in the In-Situ Testing Enclosures where applicable. Testing has been conducted in accordance with BS EN ISO 22476-3: 2005.
C	Denotes SPT test using a solid cone in preference to the split barrel sampler (usually in coarse granular soil) with all other reporting requirements as outlined above for the split barrel sampler.
S/C result of e.g. 1/2.94	Denotes where full penetration has not been achieved during the SPT test. In such cases the penetration (mm) per blow is recorded in the test result column e.g. 1/2.94 is 2.94mm of penetration per single blow.
SV	In-situ down-the-hole shear vane test. The remoulded shear strength is given in brackets.

ROCK QUALITY AND CORE RECOVERY

TCR	Total Core Recovery - the length of the recovered core expressed as a percentage of the length of core run.
SCR	Solid Core Recovery - the sum length of all core pieces that are recovered with at least one full diameter, expressed as a percentage of the length of core run.
RQD	Rock Quality Designation - The sum length of all core pieces that are 100mm or longer (measured along the centre of the core), expressed as a percentage of the length of core run.
FI	Fracture Index - The number of fractures per 1000mm length of solid core.
NI	Non-intact - The material recovered in a non-intact state.
NR	No recovery from the core run. These zones are based on the interpretation of the logging engineer and are therefore potentially subjective.

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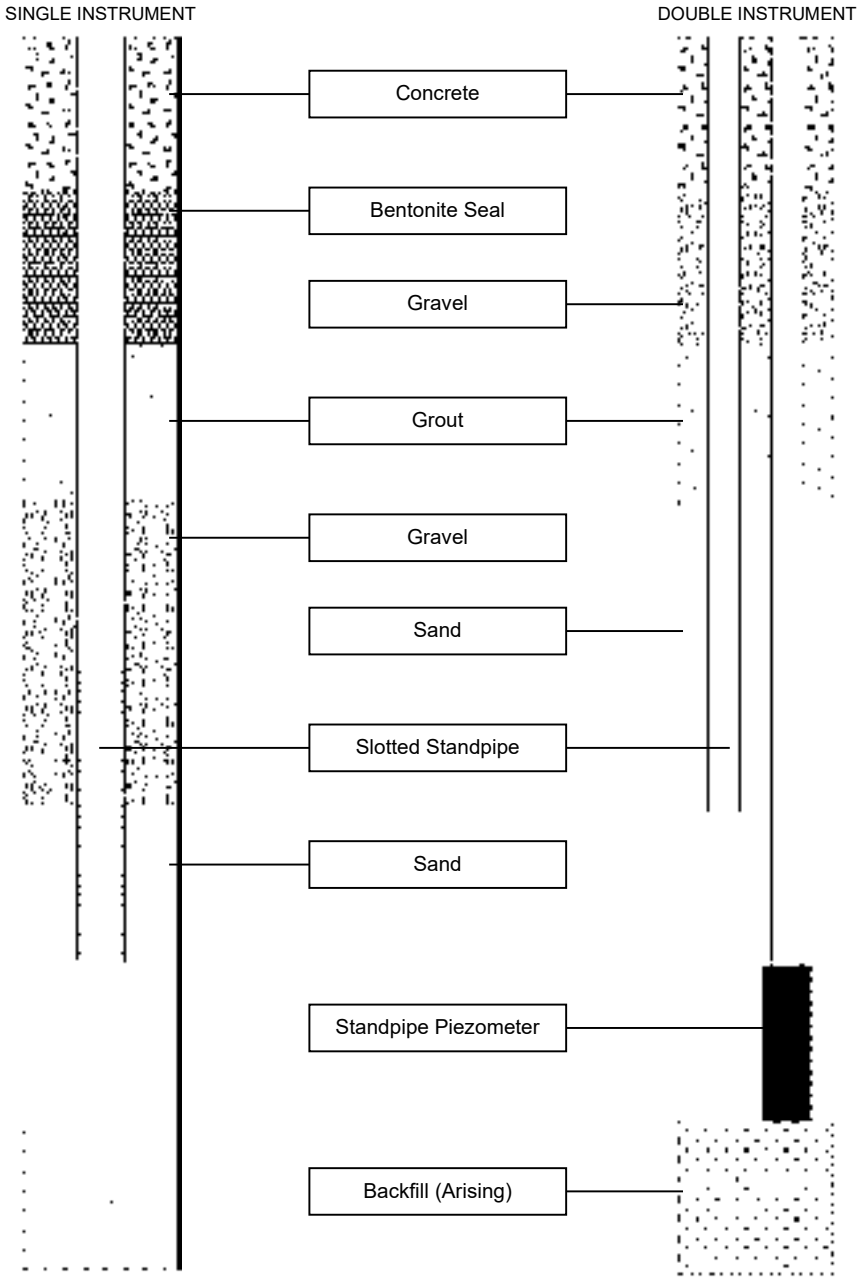
Key Sheets

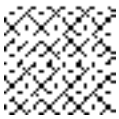
Symbols and Abbreviations: Explanation of Instrumentation Legends Used



Allied Exploration and Geotechnics Limited
Key Sheets

Symbols and Abbreviations: Explanation of Legends Used

Soils	Rocks		
	Sedimentary	*Metamorphic*	*Igneous*


Made Ground

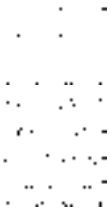

Cobbles and Boulders


Gravel

Sand


Silt

Clay


Peat

Topsoil

Note: Composite soil types will be signified by combined symbols e.g.


Silty Sand


Chalk


Limestone


Conglomerate


Breccia

Sandstone


Siltstone

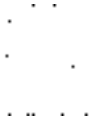
Mudstone

Shale


Coal


Pyroclastic (Volcanic Ash)


Gypsum


Coarse Grained


Medium Grained


Fine Grained


Coarse Grained


Medium Grained


Fine Grained

Exploratory Hole Location Plan

FIELD DATA ENCLOSURE 1

Allied Exploration and Geotechnics Limited
Unit 25 Stella Gill Industrial Estate
Pelton Fell
Chester - Le - Street
Co Durham
DH2 2RG
(Tel): 0191 387 4700
(Fax): 0191 387 4710
(Email): enquiries@aeg.uk.net

KEY:

TRIAL PIT

N
W E
S

Base Plan Supplied by Consulting Engineer

Drawing Title:
ENC 01 : Exploratory Hole Location Plan

Drawing No.:
AEG/4291/01

Contract Title:
Metal Processing Area Shallow Soils Investigation

Client:
South Tees Development Corporation

Consultant:
Arcadis
1 Whitehall Riverside
Leeds, LS1 4BN

Contract No.:
4291

Scale:
NOT TO SCALE

Date:
01/08/2020

MPA_AUK_TP124
MPA_AUK_TP125
MPA_AUK_TP123
MPA_AUK_TP130
MPA_AUK_TP120
MPA_AUK_TP121
MPA_AUK_TP122
MPA_AUK_TP119
MPA_AUK_TP115
MPA_AUK_TP114
MPA_AUK_TP116
MPA_AUK_TP117
MPA_AUK_TP109
MPA_AUK_TP111
MPA_AUK_TP118
MPA_AUK_TP110
MPA_AUK_TP112
MPA_AUK_TP113
MPA_AUK_TP105
MPA_AUK_TP128
MPA_AUK_TP129
MPA_AUK_TP107
MPA_AUK_TP106
MPA_AUK_TP127
MPA_AUK_TP108
MPA_AUK_TP103
MPA_AUK_TP126
MPA_AUK_TP104
MPA_AUK_TP102A
MPA_AUK_TP102
MPA_AUK_TP101

Teesside Works, Cleveland

FIELD DATA ENCLOSURE 2

Trial Pit Records

Trial Pit Summary Table

Exploratory Hole Number	Excavation Method	Completion Depth (m BGL)	Remarks
MPA_AUK_TP101	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP102	Machine excavated	0.80	Terminated due to encountering concrete slab.
MPA_AUK_TP102A	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP103	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP104	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP105	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP106	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP107	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP108	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP109	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP110	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP111	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP112	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP113	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP114	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP115	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP116	Machine excavated	3.20	Terminated due to an obstruction.
MPA_AUK_TP117	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP118	Machine excavated	3.20	Terminated due to snapped ripper tooth on excavator.
MPA_AUK_TP119	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP120	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP121	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP122	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP123	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP124	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP125	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP126	Machine excavated	4.00	Terminated due to possibly metallic obstruction.
MPA_AUK_TP127	Machine excavated	4.00	Terminated due to metallic obstruction.
MPA_AUK_TP128	Machine excavated	4.50	Advanced to required depth.
MPA_AUK_TP129	Machine excavated	1.30	Terminated due to concrete slab.
MPA_AUK_TP130	Machine excavated	4.50	Advanced to required depth.

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

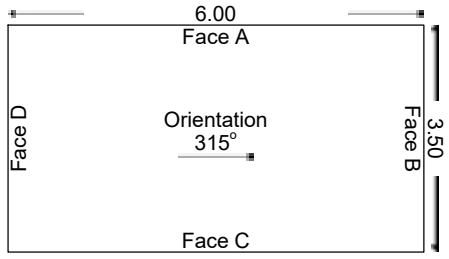
TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP101
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454685.392 N:522293.388		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 9.969	**Start Date:** 09/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.40	J1					(1.00)	MADE GROUND (Brown/black grey sandy gravel with wood and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, concrete and ash. Slag content is 75-100%. Slag is vesicular).
0.60	B2						
0.90	ES3			8.97		1.00	
1.70	J4					(1.50)	MADE GROUND (Grey green yellow blue and white gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
1.90	B5						
2.40	LB6			7.47		2.50	at c.2.40m BGL ... gravel and cobbles.
2.80	J7					(2.00)	MADE GROUND (Brown very sandy gravel with low to medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes concrete, slag and yellow brick. Slag content is 25-50%. Slag is grey, green and white vesicular. Cobbles are angular and include concrete, slag and yellow brick. Slag content is 25-50%. Slag is grey vesicular).
3.20	B8						
3.50	ES9						
3.80	J10						
4.20	B11			5.47		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP101
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454685.392 N:522293.388		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 9.969	**Start Date:** 09/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP101.1
MPA_AUK_TP101

Figure MPA_AUK_TP101.2
MPA_AUK_TP101

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP101
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454685.392 N:522293.388		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 9.969	**Start Date:** 09/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP101.3
MPA_AUK_TP101

Figure MPA_AUK_TP101.4
MPA_AUK_TP101 Spoil

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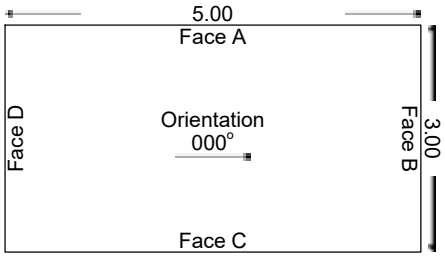
TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP102
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454663.223 N:522364.102		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.667	**Start Date:** 09/07/2020	**Sheet:** 1 of 2

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				10.47		0.20	MADE GROUND (Brown clayey slightly gravelly sand with many rootlets and wood fragments. Sand is fine to coarse. Gravel is fine to medium subangular and includes concrete and brick).
0.30	J1					(0.60)	
0.50	B2						MADE GROUND (Brown grey/blue sandy gravel. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag. Slag content is 75-100%. Slag is vesicular).
0.60	ES3			9.87		0.80	at c.0.80m BGL ... concrete slab.
							Terminated at 0.80m BGL - due to encountering concrete slab.
							Unable to extend pit due to near by services.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP102
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454663.223 N:522364.102		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.667	**Start Date:** 09/07/2020	**Sheet:** 2 of 2

Figure MPA_AUK_TP102.1
MPA_AUK_TP102

Figure MPA_AUK_TP102.2
MPA_AUK_TP102 Spoil

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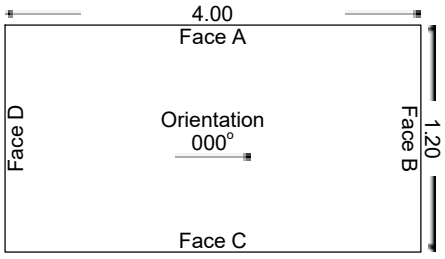
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454663.000 N:522394.000		**MPA_AUK_TP102A**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.700	**Start Date:** 13/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				10.30		(0.40) 0.40	MADE GROUND (Brown black grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular and includes slag and concrete. Slag content is 75-100%. Slag is vesicular. Assessed as 'loose').
0.50	J1						MADE GROUND (Grey green gravel with high cobble and boulder content. Gravel is fine to coarse subangular and includes slag. Cobbles and boulders are angular and include slag. Slag content is 75-100%. Assessed as 'loose').
0.80	B2						
1.00	ES3						
1.60	J4						
1.80	B5						
2.10	LB6						at c.2.10m BGL ... cobbles.
						(4.10)	
2.60	J7						
2.80	B8						
3.60	J9						between c.3.50-4.50m BGL ... very sandy with occasional yellow and red bricks.
3.80	B10						
4.30	J11			6.20		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
(1) Coordinates and level are approximate.

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:07:12

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP102A
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454663.000 N:522394.000		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.700	**Start Date:** 13/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP102A.1
MPA_AUK_TP102A

Figure MPA_AUK_TP102A.2
MPA_AUK_TP102A

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454663.000 N:522394.000		**MPA_AUK_TP102A**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.700	**Start Date:** 13/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP102A.3
MPA_AUK_TP102A Spoil

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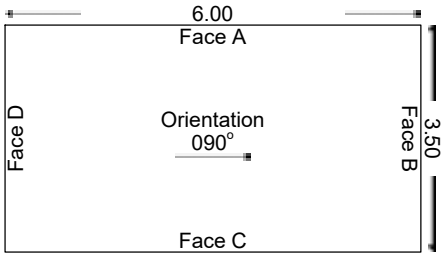
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454579.895 N:522486.316		**MPA_AUK_TP103**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.210	**Start Date:** 09/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
						(0.80)	MADE GROUND (Brown/black grey sandy gravel with wood and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, concrete and ash. Slag content is 75-100%. Slag is vesicular).
0.60	J1			9.41		0.80	
0.70	B2			9.31		0.90	
0.80	ES3						MADE GROUND (White yellow gravel. Gravel is fine to coarse subangular and includes slag. Slag content is 75-100%. Slag is vesicular).
							MADE GROUND (Grey green yellow blue and white gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular. Assessed as 'loose').
1.50	J4						at c.1.40m BGL ... 25mm diameter black cable running 270 degrees in centre of pit (redundant/broken).
1.80	B5						
2.30	LB6						at c.2.30m BGL ... cobbles.
2.60	J7					(3.60)	
2.80	B8						
3.60	J9						
3.80	B10						
				5.71		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base moderatley stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP103
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454579.895 N:522486.316		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.210	**Start Date:** 09/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP103.1
MPA_AUK_TP103

Figure MPA_AUK_TP103.2
MPA_AUK_TP103

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP103
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454579.895 N:522486.316		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.210	**Start Date:** 09/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP103.3
MPA_AUK_TP103

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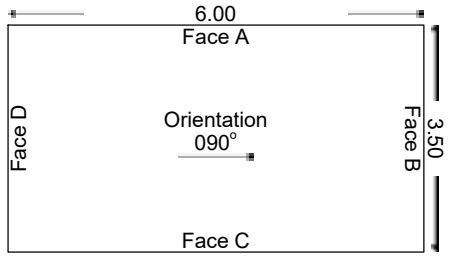
TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP104
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454628.462 N:522443.719		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.600	**Start Date:** 09/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				10.20		(0.40) 0.40	MADE GROUND (Brown/black grey sandy gravel with wood and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, concrete and ash. Slag content is 75-100%. Slag is vesicular).
0.50	J1						MADE GROUND (Grey green yellow blue and white gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular and iron rich. Assessed as 'loose;).
0.80	B2						
1.00	ES3						
1.60	J4						
1.80	B5						
2.40	LB6					(4.10)	at c.2.40m BGL ... cobbles.
2.70	J7						
2.90	B8						
3.70	J9						
3.90	B10						
				6.10		4.50	*Complete at 4.50m BGL.*

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP104
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454628.462 N:522443.719		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.600	**Start Date:** 09/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP104.1
MPA_AUK_TP104

Figure MPA_AUK_TP104.2
MPA_AUK_TP104

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP104
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454628.462 N:522443.719		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.600	**Start Date:** 09/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP104.3
MPA_AUK_TP104 Spoil

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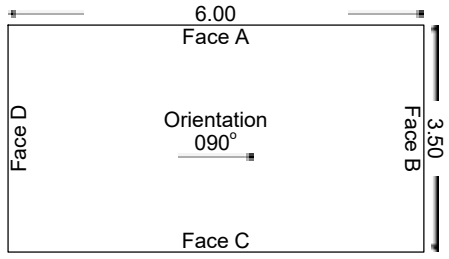
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454523.260 N:522578.126		**MPA_AUK_TP105**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.360	**Start Date:** 09/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.40	J1						MADE GROUND (Brown/black grey slightly clayey very sandy gravel with wood and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, concrete and ash. Slag content is 75-100%. Slag is vesicular).
0.70	B2						
1.00	ES3					(2.20)	between c.0.90-2.20m BGL ... assessed as 'loose'.
1.40	J4						at c.1.40m BGL ... 25mm diameter black cable running 270 degrees in centre of pit (redundant/broken).
1.70	B5			8.16		2.20	
2.60	J6						MADE GROUND (Grey green yellow blue and white gravel with with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content 75-100%. Slag is vesicular. Assessed as 'loose').
2.70	B7						
2.80	LB8						at c.2.80m BGL ... cobbles with some gravel.
3.60	J9					(2.30)	
3.70	B10						
				5.86		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base moderately stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP105
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454523.260 N:522578.126		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.360	**Start Date:** 09/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP105.1
MPA_AUK_TP105

Figure MPA_AUK_TP105.2
MPA_AUK_TP105

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP105
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454523.260 N:522578.126		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.360	**Start Date:** 09/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP105.3
MPA_AUK_TP105 Spoil

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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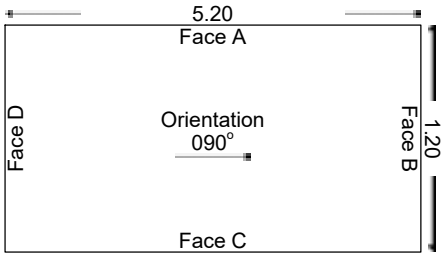
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454634.271 N:522536.013		**MPA_AUK_TP106**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.405	**Start Date:** 08/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				7.01		(0.40) 0.40	MADE GROUND (Brown grey sandy gravel with wood and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Slag content is 75-100%. Slag is vesicular).
0.50	J1						
0.80	B2					(1.10)	MADE GROUND (Grey green yellow cobbles with much gravel. Sand is fine to coarse and includes ash. Gravel is fine to coarse subangular and includes slag and yellow brick, concrete and ash. Slag content is 50-75%. Slag is vesicular. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
1.00	ES3			5.91		1.50	
1.60	J4						MADE GROUND (Grey green white sandy gravel with high cobble content. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, ash, clinker and yellow crystalline textured brick. Cobbles are angular and include yellow brick and slag. Slag content is 75-100%. Slag is vesicular).
1.80	B5						
2.20	LB6						between c.1.50-4.50m BGL ... lenses of orange brown slightly clayey sandy gravel. Sand is fine to coarse and includes ash. Gravel is fine to coarse subangular and include clinker, ash and burnt mudstone.
2.60	J7						
2.80	B8					(3.00)	
3.60	J9						
3.80	B10			2.91		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed. Between c.3.00-4.50m BGL - slag is damp.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:08:37

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP106
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454634.271 N:522536.013		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.405	**Start Date:** 08/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP106.1
MPA_AUK_TP106

Figure MPA_AUK_TP106.2
MPA_AUK_TP106

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP106
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454634.271 N:522536.013		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.405	**Start Date:** 08/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP106.3
MPA_AUK_TP106

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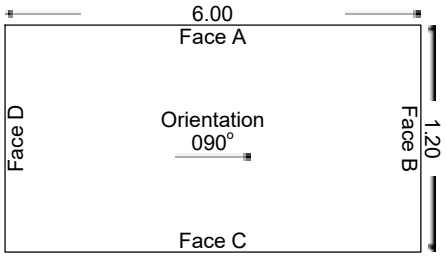
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454713.495 N:522550.212		**MPA_AUK_TP107**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.450	**Start Date:** 08/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.50	J1						MADE GROUND (Brown grey cobbles with some gravel and wood and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
0.70	B2					(1.40)	
0.90	ES3			6.05		1.40	
1.70	J4						MADE GROUND (Grey green yellow gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular). between c.1.50-2.50m BGL ... with occasional yellow brick (cobble sized).
1.90	B5						
2.20	LB6						
2.70	J7						
2.90	B8					(3.10)	
3.70	J9						
3.90	B10						
				2.95		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed. Between c.3.70-4.50m BGL - slag is damp.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:09:00

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP107
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454713.495 N:522550.212		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.450	**Start Date:** 08/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP107.1
MPA_AUK_TP107

Figure MPA_AUK_TP107.2
MPA_AUK_TP107

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP107
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454713.495 N:522550.212		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.450	**Start Date:** 08/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP107.3
MPA_AUK_TP107

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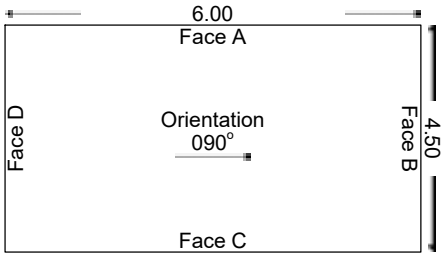
TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP108
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454686.549 N:522511.326		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.400	**Start Date:** 09/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				6.90		(0.50) 0.50	MADE GROUND (Brown grey sandy gravel with wood and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular slag and concrete. Slag content is 75-100%. Slag is vesicular).
0.60	J1						MADE GROUND (Grey green yellow blue and white gravel with high cobble content. Gravel is fine to coarse subangular and includes slag and yellow brick. Cobbles are angular and include slag. Slag content 75-100%. Slag is vesicular).
0.80	B2						
1.00	ES3						
1.60	J4						
1.80	B5						
2.30	LB6					(4.00)	
2.60	J7						
2.80	B8						
3.60	J9						
3.80	B10						
				2.90		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP108
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454686.549 N:522511.326		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.400	**Start Date:** 09/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP108.1
MPA_AUK_TP108

Figure MPA_AUK_TP108.2
MPA_AUK_TP108

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP108
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454686.549 N:522511.326		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.400	**Start Date:** 09/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP108.3
MPA_AUK_TP108

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

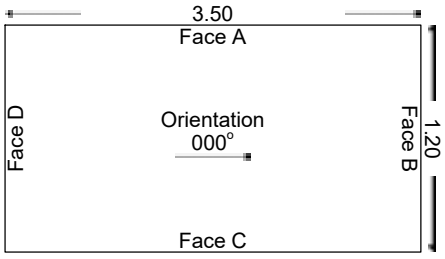
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454459.688 N:522714.469		**MPA_AUK_TP109**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 8.643	**Start Date:** 06/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				8.44		0.20	MADE GROUND (Grey brown sandy gravel with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes red brick, concrete and slag. Slag content is 50-75%. Slag is vesicular).
0.40	J1						MADE GROUND (Grey green blue gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular). between c.0.20-4.50m BGL ... pocket of red brown gravel. Gravel is fine subangular and includes iron/clinker.
0.80	B2						
0.90	ES3						
1.60	J4						
1.80	B5						
2.00	LB6						at c.2.00m BGL ... cobbles. between c.2.00-4.50m BGL ... some recovered slag has white precipitate deposits on surface.
						(4.30)	
2.60	J7						
3.00	B8						
3.60	J9						
4.00	B10						
				4.14		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:09:35

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP109
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454459.688 N:522714.469		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 8.643	**Start Date:** 06/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP109.1
MPA_AUK_TP109

Figure MPA_AUK_TP109.2
MPA_AUK_TP109

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP109
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454459.688 N:522714.469		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 8.643	**Start Date:** 06/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP109.3
MPA_AUK_TP109

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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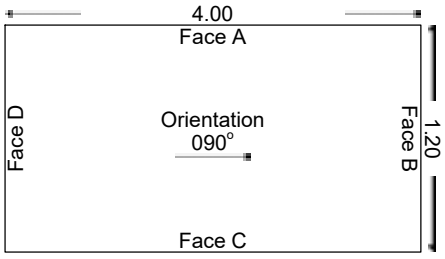
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454518.889 N:522657.800		**MPA_AUK_TP110**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.589	**Start Date:** 13/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				10.09		(0.50) 0.50	MADE GROUND (Brown black grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular and includes slag and concrete. Slag content is 75-100%. Slag is vesicular).
0.60	J1						MADE GROUND (Grey sandy gravel with high cobble content with metal and wood fragments. Gravel is fine to coarse subangular and includes slag and concrete. Slag content is 25-50%. Slag is vesicular. Cobbles are angular and include slag and concrete. Slag content is 75-100%. Slag is vesicular).
0.80	B2						
1.00	ES3					(1.90)	
1.60	J4						
1.80	B5						
2.20	LB6			8.19		2.40	
				7.59		(0.60) 3.00	MADE GROUND (Grey blue compacted sandy gravel with medium cobble content. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes yellow brick, slag and concrete. Slag content is 50-75%. Slag is vesicular. Cobbles are angular and include yellow brick and slag. Slag content is 25-50%. Slag is vesicular).
2.70	J7						
2.90	B8						
3.40	J9						MADE GROUND (Grey green and white gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular. Assessed as 'loose').
3.60	B10					(1.50)	
4.40	J11			6.09		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:09:55

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP110
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454518.889 N:522657.800		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.589	**Start Date:** 13/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP110.1
MPA_AUK_TP110

Figure MPA_AUK_TP110.2
MPA_AUK_TP110

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP110
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454518.889 N:522657.800		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.589	**Start Date:** 13/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP110.3
MPA_AUK_TP110

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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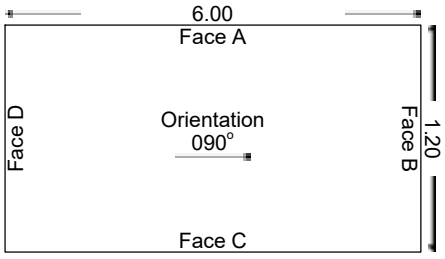
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454573.911 N:522689.264		**MPA_AUK_TP111**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 5.420	**Start Date:** 10/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.50	J1					(1.30)	MADE GROUND (Brown grey gravel with wood and metal fragments. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Slag content 75-100%. Slag is vesicular).
0.80	B2						
1.20	ES3			4.12		1.30	at c.1.10-1.40m BGL ... iron girder running 225 degrees.
1.60	J4						MADE GROUND (Grey green yellow blue gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content 75-100%. Slag is vesicular). between c.1.40-1.70m BGL ... concrete beneath iron girder.
1.80	B5						
2.20	LB6						
2.60	J7						
2.80	B8					(3.20)	
3.60	J9						
3.80	B10		▼1				
4.20	J11			0.92		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
Water strike at 3.90m BGL (Moderate Inflow). At c.3.30m BGL - slag is Damp.

STABILITY
Pit sides and base moderately stable between 0.00-1.30m BGL stable below.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:10:15

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP111
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454573.911 N:522689.264		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 5.420	**Start Date:** 10/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP111.1
MPA_AUK_TP111

Figure MPA_AUK_TP111.2
MPA_AUK_TP111

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP111
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454573.911 N:522689.264		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 5.420	**Start Date:** 10/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP111.3
MPA_AUK_TP111

Figure MPA_AUK_TP111.4
MPA_AUK_TP111

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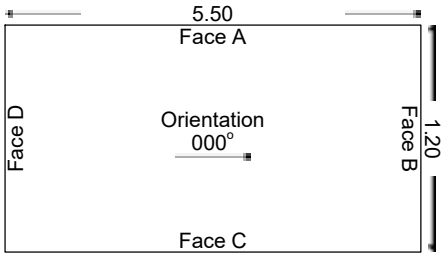
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454678.306 N:522609.878		**MPA_AUK_TP112**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.496	**Start Date:** 08/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.60 0.70 0.90	J1 B2 ES3			6.10		(1.40) 1.40	MADE GROUND (Brown grey sandy gravel with high cobble content with wood and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
1.60 1.80 2.10 2.60 2.80 3.70 3.90 4.30	J4 B5 LB6 J7 B8 J9 B10 J11			3.00		(3.10) 4.50	MADE GROUND (Grey green yellow blue and white sandy gravel with high cobble content. Sand is fine to coarse and includes ash. Gravel is fine to coarse subangular and includes slag, yellow brick, concrete and ash. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular). between c.2.00-4.50m BGL ... slag is more iron rich. at c.2.10m BGL ... cobbles with some gravel.
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed. At c.3.70-4.50m BGL - slag is damp.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:10:40

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP112
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454678.306 N:522609.878		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.496	**Start Date:** 08/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP112.1
MPA_AUK_TP112

Figure MPA_AUK_TP112.2
MPA_AUK_TP112

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP112
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454678.306 N:522609.878		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.496	**Start Date:** 08/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP112.3
MPA_AUK_TP112

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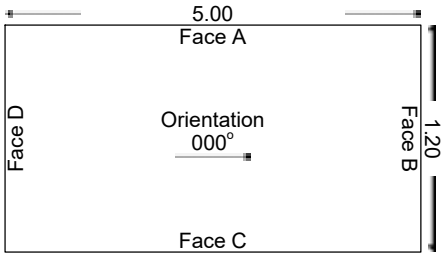
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454705.251 N:522610.362		**MPA_AUK_TP113**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.446	**Start Date:** 08/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				7.05		(0.40) 0.40	MADE GROUND (Brown grey sandy gravel with wood and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Slag content is 75-100%. Slag is vesicular).
0.60	J1						MADE GROUND (Grey green yellow blue and white gravel with high cobble content. Gravel is fine to coarse subangular and includes slag and yellow brick. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
0.80	B2						
0.90	ES3						at c.1.20m BGL ... fine to medium sand (relic bedding for a cable).
1.60	J4						
1.80	B5						
2.30	LB6					(4.10)	at c.2.30m BGL ... clayey very sandy gravel with occasional clay pockets and medium cobble content.
2.60	J7						between c.2.40-4.50m BGL ... lenses of red brown clayey sandy gravel. Sand is fine to coarse and includes ash and clinker. Gravel is fine to coarse subangular and includes ash, clinker and burnt mudstone.
2.80	B8						
3.60	J9						
3.80	B10						at c.3.80m BGL ... cobbles with some gravel.
				2.95		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed. At c.3.50-4.50m BGL - slag is damp.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

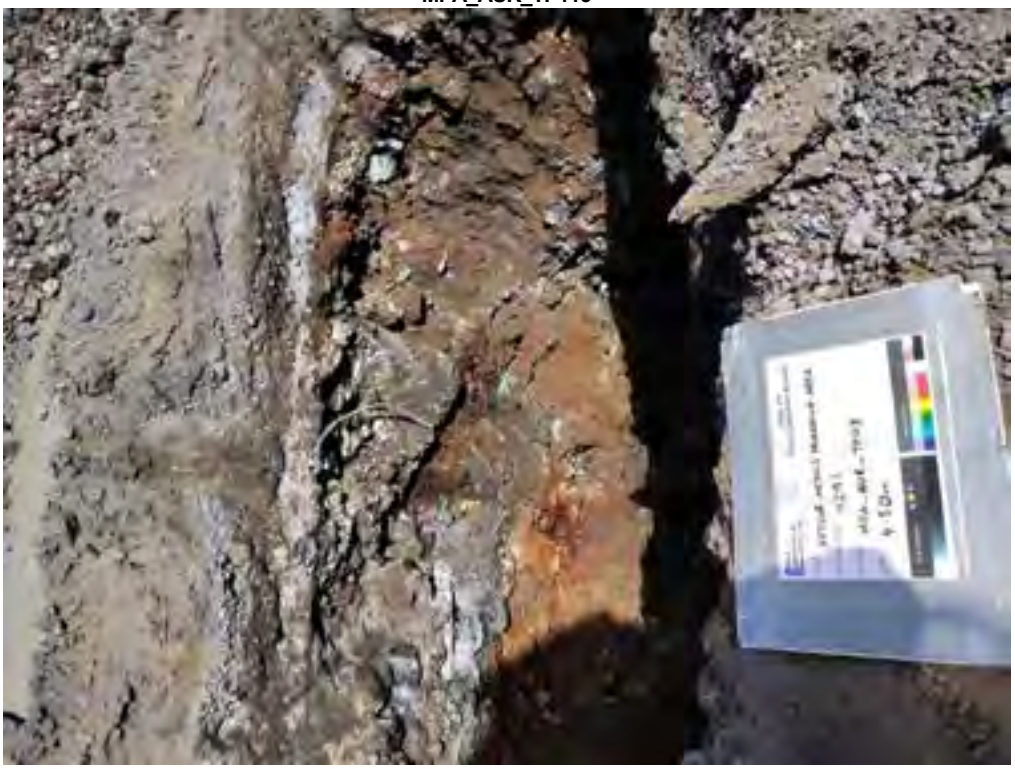
TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP113
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454705.251 N:522610.362		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.446	**Start Date:** 08/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP113.1
MPA_AUK_TP113

Figure MPA_AUK_TP113.2
MPA_AUK_TP113



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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP113
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454705.251 N:522610.362		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.446	**Start Date:** 08/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP113.3
MPA_AUK_TP113

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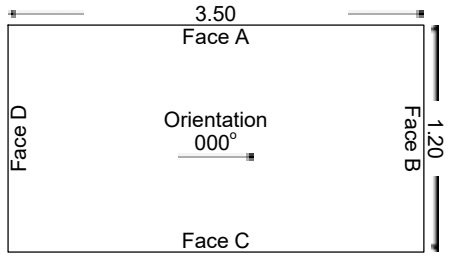
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454345.840 N:522786.212		**MPA_AUK_TP114**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.035	**Start Date:** 06/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				9.64		(0.40) 0.40	MADE GROUND (Brown grey gravel. Gravel is fine to coarse subangular and includes slag. Slag content is 75-100%. Slag is vesicular).
0.60 0.70 0.80	J1 B2 ES2A			8.44		(1.20) 1.60	MADE GROUND (Brown grey green beige gravel. Gravel is medium to coarse subangular and includes slag. Slag content is 75-100%. Slag is vesicular).
1.70 1.80 2.30 2.50	J3 B4 J5 LB6						MADE GROUND (Compacted grey green blue gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular). at c.2.50m BGL ... cobbles with little gravel. at c.2.60m BGL ... slag is fused.
3.30 3.80 4.30	J7 B8 J9			5.54		(2.90) 4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:11:18

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP114
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454345.840 N:522786.212		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.035	**Start Date:** 06/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP114.1
MPA_AUK_TP114

Figure MPA_AUK_TP114.2
MPA_AUK_TP114

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP114
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454345.840 N:522786.212		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 10.035	**Start Date:** 06/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP114.3
MPA_AUK_TP114

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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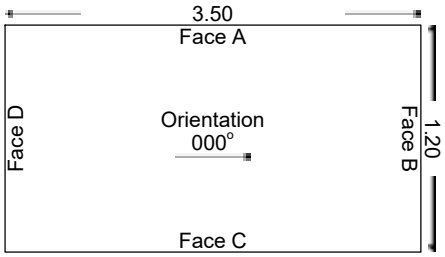
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454484.884 N:522797.577		**MPA_AUK_TP115**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 8.046	**Start Date:** 06/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				7.75		0.30	MADE GROUND (Grey brown sandy gravel with low cobble content. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes yellow brick, concrete and slag. Slag content is 50-75%. Slag is vesicular).
0.40	J1						
0.50	B2						
0.60	ES3					(1.00)	MADE GROUND (Grey/blue clayey very sandy gravel. Sand is fine to coarse and includes blue grey ash like substance. Gravel is fine to coarse subangular and includes slag. Slag content is 50-75%. Slag is vesicular).
				6.75		1.30	
1.40	J4						MADE GROUND (Grey green blue beige gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
1.50	B5						
2.00	LB6						at c.2.00m BGL ... cobbles with little gravel.
2.60	J7						
2.80	B8					(3.20)	
3.80	J9						
4.00	B10						
				3.55		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed. At c.3.80m BGL - slag is damp.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:11:37

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454484.884 N:522797.577		**MPA_AUK_TP115**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 8.046	**Start Date:** 06/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP115.1
MPA_AUK_TP115

Figure MPA_AUK_TP115.2
MPA_AUK_TP115

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP115
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454484.884 N:522797.577		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 8.046	**Start Date:** 06/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP115.3
MPA_AUK_TP115

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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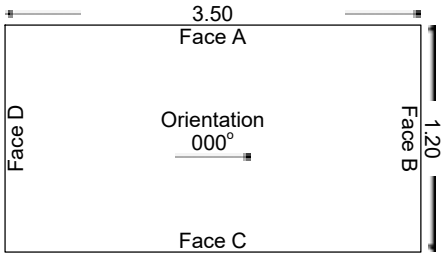
TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP116
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454567.524 N:522775.268		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.355	**Start Date:** 06/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				7.06		0.30	MADE GROUND (Grey brown sandy gravel with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular and includes yellow brick, concrete and slag. Slag content is 50-75%. Slag is vesicular).
0.40	J1						
0.60	B2						MADE GROUND (Grey green blue gravel and cobbles. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
0.80	ES3						between c.0.30-3.20m BGL ... pocket of red brown gravel. Gravel is fine subangular and include iron/clinker.
1.40	J4						
1.60	B5					(2.90)	
2.00	LB6						between c.1.80-3.20m BGL ... some recovered slag has white precipitate deposits on surface.
2.40	J7						
2.80	B8						
				4.16		3.20	
							Terminated at 3.20m BGL - obstruction.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:11:51

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP116
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454567.524 N:522775.268		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.355	**Start Date:** 06/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP116.1
MPA_AUK_TP116

Figure MPA_AUK_TP116.2
MPA_AUK_TP116

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP116
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454567.524 N:522775.268		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.355	**Start Date:** 06/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP116.3
MPA_AUK_TP116

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
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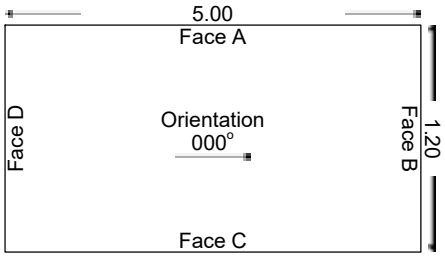
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454708.734 N:522766.034		**MPA_AUK_TP117**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.965	**Start Date:** 08/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				7.77		0.20	MADE GROUND (Brown grey gravel with wood and metal fragments. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Slag content is 75-100%. Slag is vesicular).
0.30	J1						
0.50	B2						MADE GROUND (Grey green yellow gravel with high cobble content. Gravel is fine to coarse subangular and includes slag and yellow brick. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
0.60	ES3						at c.1.00m BGL ... previously backfilled/tipped. 2No. 50mm diameter redundant pipe sections running 270 degrees (in middle of pit) with fibrous cement lagging.
1.30	J4						
1.50	B5						
2.00	LB6						at c.2.00m BGL ... cobbles with some gravel.
2.30	J7					(4.30)	
2.50	B8						between c.2.80-4.50m BGL ... lenses of red brown sandy gravel. Sand is fine to coarse and includes predominantly ash. Gravel is fine to medium subangular and includes ash, clinker and burnt mudstone.
3.30	J9						
3.50	B10						
4.30	J11			3.47		4.50	
4.50	B12						*Complete at 4.50m BGL.*

PLAN



GROUNDWATER
No groundwater inflow observed. At c.3.50-4.00m BGL - Slag is damp.

STABILITY
Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:12:05

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP117
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454708.734 N:522766.034		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.965	**Start Date:** 08/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP117.1
MPA_AUK_TP117

Figure MPA_AUK_TP117.2
MPA_AUK_TP117

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP117
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454708.734 N:522766.034		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.965	**Start Date:** 08/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP117.3
MPA_AUK_TP117

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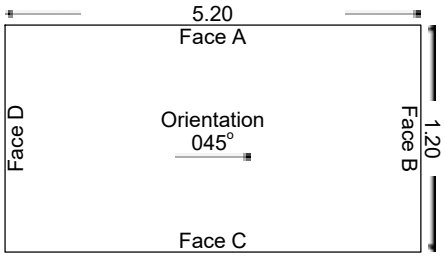
TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454739.993 N:522662.828		**MPA_AUK_TP118**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.317	**Start Date:** 08/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				7.02		0.30	MADE GROUND (Brown grey gravel with wood and metal fragments. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Slag content is 75-100%. Slag is vesicular).
0.50	J1						MADE GROUND (Grey green yellow slightly clayey sandy gravel with medium to high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
0.60	B2						
0.80	ES3						
						(2.90)	
1.80	J4						between c.1.80-3.20m BGL ... slag is fused.
1.90	B5						at c.2.00m BGL ... cobbles with some gravel.
2.00	LB6						
							at c.2.50m BGL ... large fused section of slag.
2.80	J7						
2.90	B8						
				4.12		3.20	
							Terminated at 3.20m BGL - due to snapped ripper tooth on excavator.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP118
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454739.993 N:522662.828		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.317	**Start Date:** 08/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP118.1
MPA_AUK_TP118

Figure MPA_AUK_TP118.2
MPA_AUK_TP118

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP118
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454739.993 N:522662.828		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.317	**Start Date:** 08/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP118.3
MPA_AUK_TP118 Spoil

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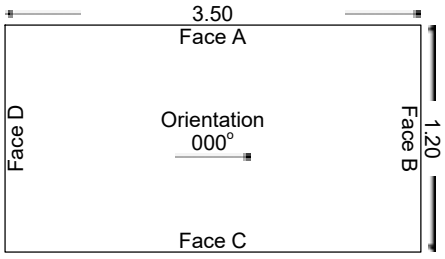
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454305.588 N:522861.286		**MPA_AUK_TP119**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 9.069	**Start Date:** 06/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.30	J1					(1.20)	MADE GROUND (Brown clayey very sandy gravel with wood and metal fragments. Sand is fine to coarse. Gravel is fine to coarse subangular and includes red brick, concrete and slag. Slag content is 25-50%. Slag is grey vesicular).
0.80	B2						
1.00	ES3			7.87		1.20	
1.40	J4			7.57		1.50	MADE GROUND (Grey black compacted ash. Recovered as gravel. Gravel is fine to coarse angular).
1.70	J5						MADE GROUND (Grey green blue gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
2.00	B6						
2.70	J7						at c.2.60m BGL ... slag is mainly blue grey.
3.00	LB8					(3.00)	at c.3.00m BGL ... cobbles with some gravel.
3.70	J9						at c.3.60m BGL ... a pocket of yellow bricks noted.
4.00	B10						
				4.57		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:12:38

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP119
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454305.588 N:522861.286		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 9.069	**Start Date:** 06/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP119.1
MPA_AUK_TP119

Figure MPA_AUK_TP119.2
MPA_AUK_TP119

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP119
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454305.588 N:522861.286		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 9.069	**Start Date:** 06/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP119.3
MPA_AUK_TP119

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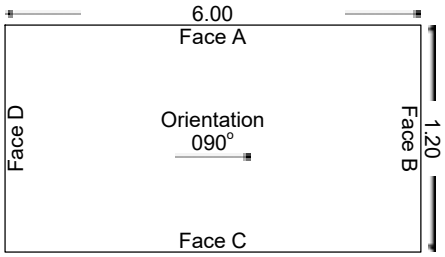
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454403.192 N:522886.748		**MPA_AUK_TP120**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 6.977	**Start Date:** 07/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				6.68		0.30	MADE GROUND (Brown grey gravel with wood and metal fragments. Gravel is fine to coarse subangular and includes slag and concrete. Slag content is 75-100%. Slag is vesicular).
0.40	J1			6.48		0.50	
0.60	B2						MADE GROUND (Compacted grey green blue gravel. Gravel is fine to coarse subangular anf includes slag and ash. Slag content is 75-100%. Slag is vesicular).
0.80	ES3						MADE GROUND (Grey green blue cobbles with some gravel. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and includes slag. Slag content is 75-100%. Slag is vesicular).
1.60	J4						
1.80	B5						
2.00	LB6						at c.2.00m BGL ... cobbles.
						(4.00)	
2.60	J7						
2.80	B8						between c.2.90-4.50m BGL ... slag is fused with whites deposits on surface.
3.60	J9						
3.80	B10						at c.3.80m BGL ... cobbles.
				2.48		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:12:52

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP120
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454403.192 N:522886.748		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 6.977	**Start Date:** 07/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP120.1
MPA_AUK_TP120

Figure MPA_AUK_TP120.2
MPA_AUK_TP120

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP120
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454403.192 N:522886.748		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 6.977	**Start Date:** 07/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP120.3
MPA_AUK_TP120

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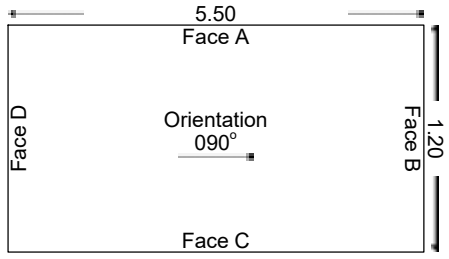
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454522.384 N:522877.338		**MPA_AUK_TP121**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 8.400	**Start Date:** 07/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				8.10		0.30	MADE GROUND (Brown grey gravel with wood and metal fragments. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Slag content is 75-100%. Slag is vesicular).
0.50	J1						MADE GROUND (Grey green yellow sandy gravel with high cobble content and metal fragments. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag, yellow brick and concrete. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
0.60	B2						
0.80	ES3					(1.60)	
				6.50		1.90	
2.00	J4						MADE GROUND (Grey green blue gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and includes slag. Slag content is 75-100%. Slag is vesicular). at c.2.50m BGL ... cobbles.
2.20	B5					(1.00)	
2.50	LB6						
				5.50		2.90	
3.00	J7						MADE GROUND (Grey green yellow blue sandy gravel with high cobble content. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag and yellow brick. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular). between c.2.90-4.50m BGL ... lenses of orange brown clayey gravel. Gravel is fine to coarse angular and includes burnt mudstone.
3.20	B8					(1.60)	
4.00	J9						
4.20	B10						
				3.90		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:13:08

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP121
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454522.384 N:522877.338		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 8.400	**Start Date:** 07/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP121.1
MPA_AUK_TP121

Figure MPA_AUK_TP121.2
MPA_AUK_TP121

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP121
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454522.384 N:522877.338		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 8.400	**Start Date:** 07/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP121.3
MPA_AUK_TP121

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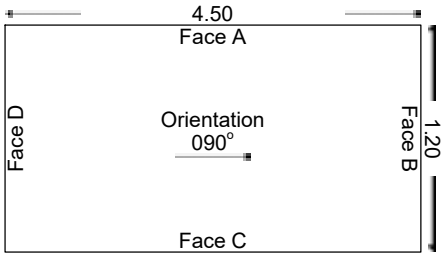
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454598.678 N:522875.032		**MPA_AUK_TP122**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.922	**Start Date:** 07/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				7.62		0.30	MADE GROUND (Brown grey gravel with wood and metal fragments. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Slag content is 75-100%. Slag is vesicular).
0.40	J1						
0.50	B2						MADE GROUND (Grey green yellow blue gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
0.70	ES3						
1.40	J4						
1.70	B5						at c.1.70m BGL ... cobbles with some gravel.
						(4.20)	
2.50	J6						
2.80	LB7						at c.2.80m BGL ... cobbles with some gravel. between c.2.80-4.50m BGL ... slag is fused.
3.50	J8						
3.80	B9						
				3.42		4.50	
4.50	J10						*Complete at 4.50m BGL.*

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP122
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454598.678 N:522875.032		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.922	**Start Date:** 07/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP122.1
MPA_AUK_TP122

Figure MPA_AUK_TP122.2
MPA_AUK_TP122

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP122
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454598.678 N:522875.032		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.922	**Start Date:** 07/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP122.3
MPA_AUK_TP122

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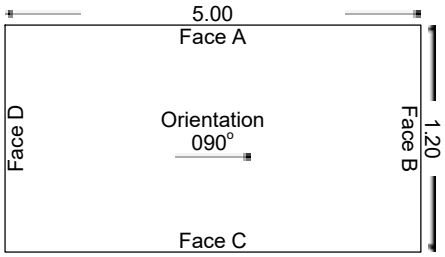
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454389.723 N:522952.986		**MPA_AUK_TP123**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.198	**Start Date:** 07/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				6.80		(0.40) 0.40	MADE GROUND (Brown grey gravel with wood and metal fragments. Gravel is fine to coarse subangular and includes slag, concrete and purple brick. Slag content is 75-100%. Slag is vesicular).
				6.60		0.60	MADE GROUND (Compacted grey green blue gravel. Gravel is fine to coarse subangular and includes slag and ash. Slag content is 75-100%. Slag is vesicular).
				6.50		0.70	
0.80	J1						MADE GROUND (Yellow brown sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular and includes limestone and sandstone).
0.90	B2						
1.00	ES3						
1.80	J4						MADE GROUND (Grey green yellow blue gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and includes slag. Slag content is 75-100%. Slag is vesicular).
1.90	B5						
2.30	LB6						at c.2.30m BGL ... cobbles with some gravel.
						(3.80)	
2.80	J7						
2.90	B8						
3.80	J9						
3.90	B10						
				2.70		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:13:44

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP123
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454389.723 N:522952.986		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.198	**Start Date:** 07/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP123.1
MPA_AUK_TP123

Figure MPA_AUK_TP123.2
MPA_AUK_TP123

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP123
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454389.723 N:522952.986		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.198	**Start Date:** 07/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP123.3
MPA_AUK_TP123

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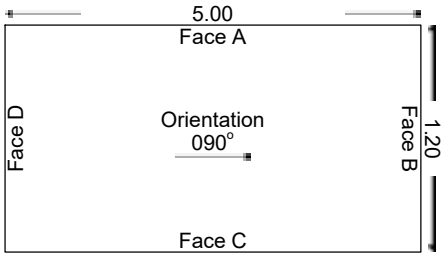
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454459.744 N:522994.039		**MPA_AUK_TP124**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.230	**Start Date:** 07/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
				6.93		0.30	MADE GROUND (Brown grey gravel with wood and metal fragments. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Slag content is 75-100%. Slag is vesicular).
0.30	J1						MADE GROUND (Grey green yellow blue gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular). between c.1.00-4.50m BGL ... random lenses and bands of orange burnt clayey shale (recovered as fine to coarse angular gravel).
0.60	B2						
0.80	ES3						
1.50	J4						
1.60	B5						at c.1.60m BGL ... cobbles with little gravel.
2.00	LB6					(4.20)	
2.70	J7						between c.2.80-4.50m BGL ... slag is fused with white deposits on surface.
3.00	B8						
3.70	J9						
4.00	B10						
				2.73		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP124
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454459.744 N:522994.039		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.230	**Start Date:** 07/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP124.1
MPA_AUK_TP124

Figure MPA_AUK_TP124.2
MPA_AUK_TP124

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP124
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454459.744 N:522994.039		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.230	**Start Date:** 07/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP124.3
MPA_AUK_TP124

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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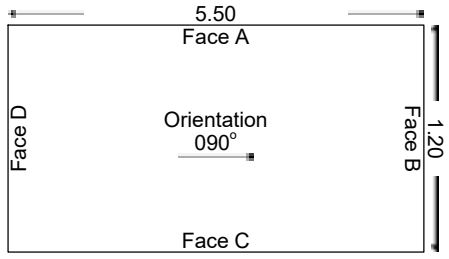
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454513.712 N:522965.533		**MPA_AUK_TP125**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.708	**Start Date:** 07/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.40	J1						MADE GROUND (Brown grey gravel with wood and metal fragments. Gravel is fine to coarse subangular and includes slag, concrete and yellow and red brick. Slag content is 75-100%. Slag is vesicular).
0.60	B2						
0.80	ES3					(1.80)	
				5.91		1.80	
1.90	J4						MADE GROUND (Grey green yellow blue cobbles with some gravel. Gravel is fine to coarse subangular and includes slag and yellow brick. Slag content is 75-100%. Slag is vesicular. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
2.20	B5						
2.40	LB6						
2.90	J7					(2.70)	
3.20	B8						between c.3.10-4.50m BGL ... slag is fused.
3.90	J9						
4.20	B10						
				3.21		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP125
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454513.712 N:522965.533		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.708	**Start Date:** 07/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP125.1
MPA_AUK_TP125

Figure MPA_AUK_TP125.2
MPA_AUK_TP125

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TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP125
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454513.712 N:522965.533		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.708	**Start Date:** 07/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP125.3
MPA_AUK_TP125

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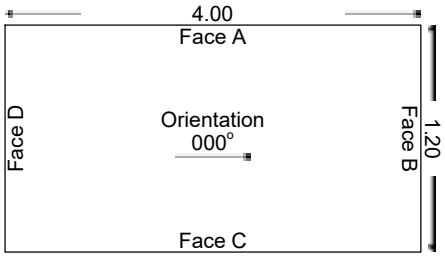
TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP126
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454677.394 N:522465.464		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.523	**Start Date:** 13/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.40	J1					(1.10)	MADE GROUND (Brown black grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular and includes slag. Slag content is 75-100%. Slag is vesicular).
0.60	B2						at c.0.60m BGL ... cobble with some gravel.
0.80	ES3			6.42		1.10	
1.60	J4					(2.90)	MADE GROUND (Grey green gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
1.80	B5						
2.30	LB6						
2.60	J7						
2.80	B8						
3.60	J9						
3.80	B10			3.52		4.00	at c.4.00m BGL ... obstruction (possibly metalic). *Terminated at 4.00m BGL - obstruction possibly metallic.*

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP126
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454677.394 N:522465.464		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.523	**Start Date:** 13/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP126.1
MPA_AUK_TP126

Figure MPA_AUK_TP126.2
MPA_AUK_TP126

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TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP126
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454677.394 N:522465.464		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.523	**Start Date:** 13/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP126.3
MPA_AUK_TP126

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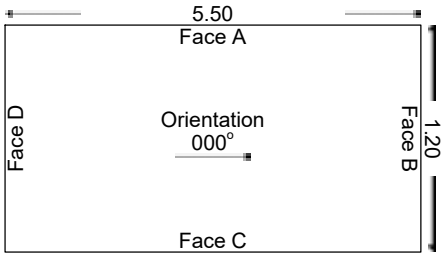
TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP127
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454693.944 N:522537.382		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.405	**Start Date:** 10/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.40	J1					(1.00)	MADE GROUND (Brown black grey sandy gravel with wood and metal fragments. Sand is fine to medium and includes predominantly ash. Gravel is fine to coarse subangular and includes slag and concrete. Slag content is 25-50%. Slag is vesicular).
0.60	B2						
0.90	ES3			6.41		1.00	
1.60	J4					(3.00)	MADE GROUND (Grey green yellow white gravel with high cobble and medium boulder content. Gravel is fine to coarse subangular and includes slag. Cobbles and boulders are angular and include slag. Slag content is 75-100%. Slag is vesicular). at c.1.60m BGL ... 75mm diameter electric cable running 270 degrees in centre of pit (redundant).
1.80	B5						
2.30	LB6						
2.60	J7						
2.80	B8						
3.60	J9						
3.80	B10			3.41		4.00	at c.4.00m BGL ... metalic obstruction - possible ladle bottom. *Terminated at 4.00m BGL - metallic obstruction.*

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP127
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454693.944 N:522537.382		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.405	**Start Date:** 10/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP127.1
MPA_AUK_TP127

Figure MPA_AUK_TP127.2
MPA_AUK_TP127

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP127
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454693.944 N:522537.382		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.405	**Start Date:** 10/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP127.3
MPA_AUK_TP127 Spoil

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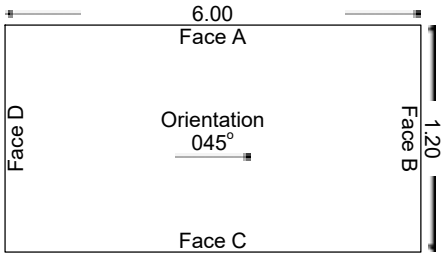
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454711.391 N:522576.301		**MPA_AUK_TP128**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.902	**Start Date:** 10/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.40	J1					(1.00)	MADE GROUND (Brown grey clayey very gravelly sand with wood fragments. Sand is fine to medium and predominantly includes ash. Gravel is fine to coarse subangular and includes slag and concrete. Slight hydrocarbon odour noted. Slag content is 25-50%. Slag is vesicular).
0.60	B2						
0.90	ES3			6.90		1.00	
1.30	J4						MADE GROUND (Grey green yellow white gravel with high cobble content. Gravel is fine to coarse subangular and includes slag. Slag content is 50-75% becoming 75-100% with depth. Slag is vesicular. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular).
1.50	B5						at c.1.60m BGL ... 75mm electric cable running 270 degrees in centre of pit (redundant).
2.60	J6					(3.50)	between c.2.50-4.50m BGL ... with lenses of orange brown clayey sandy gravel. Sand is fine to medium. Gravel is fine to medium subangular and includes burnt mudstone, clinker and ash.
2.80	B7						
3.00	LB8						at c.3.00m BGL ... cobbles with some gravel.
3.60	J9						
3.80	B10						
				3.40		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed. At c.4.20-4.50m - slag is damp.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION

Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:15:12

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP128
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454711.391 N:522576.301		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.902	**Start Date:** 10/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP128.1
MPA_AUK_TP128

Figure MPA_AUK_TP128.2
MPA_AUK_TP128

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP128
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454711.391 N:522576.301		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.902	**Start Date:** 10/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP128.3
MPA_AUK_TP128

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

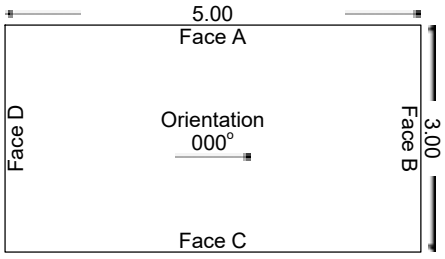
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454766.172 N:522560.929		**MPA_AUK_TP129**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.280	**Start Date:** 13/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.50	J1					(1.30)	MADE GROUND (Brown black grey sandy gravel with wood fragments. Sand is fine to coarse. Gravel is fine to coarse subangular and includes slag and concrete. Slag content is 75-100%. Slag is vesicular). at c.0.10m BGL ... grey concrete angular boulder. between c.0.40-1.30m BGL ... concrete wall at southern face of pit.
0.80	B2						
1.10	ES3			5.98		1.30	at c.1.30m BGL ... concrete slab. *Terminated at 1.30m BGL - concrete slab.*

PLAN



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:15:30

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP129
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454766.172 N:522560.929		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.280	**Start Date:** 13/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP129.1
MPA_AUK_TP129

Figure MPA_AUK_TP129.2
MPA_AUK_TP129

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP129
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454766.172 N:522560.929		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.280	**Start Date:** 13/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP129.3
MPA_AUK_TP129 Spoil

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

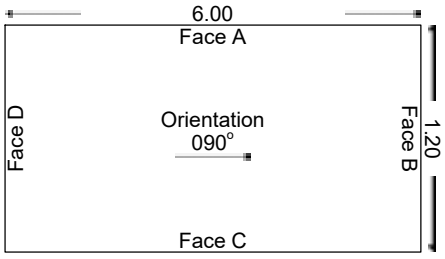
TRIAL PIT RECORD

Status:- **FINAL**

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.**
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454486.409 N:522919.938		**MPA_AUK_TP130**
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.682	**Start Date:** 10/07/2020	**Sheet:** 1 of 3

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.20 0.30 0.60	J1 B2 ES3			6.68		(1.00) 1.00	MADE GROUND (Brown grey slightly sandy gravel and cobbles with wood, metal cable and sheet metal (2.00x 2.00m). Gravel is fine to coarse subangular slag, concrete and yellow and red brick. Cobbles are angular and include slag and yellow and red brick. Slag content is 50-75%. Slag is vesicular).
1.20 1.30 2.30 2.50 3.30 3.50	J4 B5 J6 LB7 J8 B9					(3.50)	MADE GROUND (Grey green yellow blue slightly clayey sandy gravel with high cobble content and metal fragments. Gravel is fine to coarse subangular and includes slag. Cobbles are angular and include slag. Slag content is 75-100%. Slag is vesicular). between c.2.00-4.50m BGL ... with lenses of orange brown clayey sandy gravel. Sand is fine to medium. Gravel is fine to medium subangular and includes burnt mudstone and clinker.
4.30 4.40	J10 B11			3.18		4.50	
							Complete at 4.50m BGL.

PLAN



GROUNDWATER
No groundwater inflow observed. At c.3.50m BGL - slag is damp.

STABILITY
Pit sides and base unstable between 0.00-2.00m BGL. Stable below 2.00m BGL.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: K.W.	Logged by: D. Portsmouth	Contract No. **4291**

Print Date and Time: 12/11/2020 10:15:47

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP130
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454486.409 N:522919.938		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.682	**Start Date:** 10/07/2020	**Sheet:** 2 of 3

Figure MPA_AUK_TP130.1
MPA_AUK_TP130

Figure MPA_AUK_TP130.2
MPA_AUK_TP130

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG **Tel:** 0191 387 4700 **Fax:** 0191 387 4710
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL **Tel:** 01772 735 300 **Fax:** 01772 735 999

TRIAL PIT RECORD

Status:- FINAL

Project: Metal Processing Area Shallow Soils Investigation			**Exploratory Hole No.** MPA_AUK_TP130
Client: South Tees Development Corporation	**Location:** Former Redcar Steelworks, Redcar E:454486.409 N:522919.938		
Method (Equipment): Machine Excavated (JCB 360 Tracked)	**Ground Level (m):** 7.682	**Start Date:** 10/07/2020	**Sheet:** 3 of 3

Figure MPA_AUK_TP130.3
MPA_AUK_TP130 Spoil

FIELD DATA ENCLOSURE 3

Groundwater Observations Made at the Time of Site Works

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: [illegible]
Regional Office: [illegible]
Tel: [illegible] Fax: [illegible]
Tel: [illegible] Fax: [illegible]

GROUNDWATER OBSERVATIONS MADE AT THE TIME OF SITE WORKS (WATER STRIKES)

Exploratory Hole No.	Date	Depth of Water (m)	Depth of Casing (m)	Depth Sealed (m)	Final Depth (m)	Total Time (mins)	Depth After 5 mins	Depth After 10 mins	Depth After 15 mins	Depth After 20 mins	Remarks
MPA_AUK_TP111	10/07/2020	3.90									Moderate Inflow

Contract Title :- Metal Processing Area Shallow Soils Investigation		Client :- South Tees Development Corporation		AEG Contract No :- 4291
Date of Issue :- 06/11/2020	Page No :- 1 of 1	Checked By :- LC	Approved By :- KW	Certificate No :- GWOW6/4291/1

In-situ Test Report Certificate

IN-SITU TESTING ENCLOSURES

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RS - Tel: 0191 3874700 Fax: 0191 3874710
Regional Office: Unit 20 Business Development Centre, Barnard Wharf, Blackburn, BB1 1BB - Tel: 01254 503 200 Fax: 01254 662 590

IN-SITU TESTING REPORT CERTIFICATE

UKAS TESTING
1367

Contract Title: Metal Processing Area Shallow Soils Investigation

AEG Reference: 4291

Client Address: South Tees Development Corporation

I certify that *in-situ* testing was carried out on the above contract in accordance with techniques outlined in BS 1377: 1990: Part 9 or other appropriate standards as quoted, and the following results, given on the attached enclosures, were obtained.

The tests carried out are indicated in the attached table showing the enclosure number and the total number of pages.

For and on behalf of Allied Exploration & Geotechnics Limited

☐ Nick Vater (Managing Director)

☑ Kerry Wade (Technical Manager)

Signed _____ Date: 06 November 2020

Tests marked not UKAS accredited in this certificate are not included in the UKAS accreditation schedule for our laboratory. Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

IN-SITU TESTING REPORT CERTIFICATE

ENCLOSURES

Enclosure Number	Description	UKAS Accredited	Reference	No. of Pages
0	Test Report Certificate	N/A		2
-	Standard Penetration Test Results (SPT)	Yes	BS 1377 Part 9 1990	-
-	Hand Shear Vane Test Results	No		-
-	Variable Head Permeability Test Results	No	BS 5930 1999 Section 4	-
-	*In-situ* Water Quality Parameter Test Results	No		-
-	Density by Sand Replacement Method	Yes	BS 1377 Part 9 1990	-
-	Density by Core Cutter Method	Yes	BS 1377 Part 9 1990	-
-	Determination of the Vane Shear Strength (Down the Hole)	Yes	BS 1377 Part 9 1990	-
-	Shallow Pad (skip) Load Test Results	No	BS 1377 Part 9 1990	-
-	Determination of the California Bearing Ratio	Yes	BS 1377 Part 9 1990	-
1	Plate Loading Test Results	No	BS 1377 Part 9 1990	3
-	Apparent Resistivity of Soil	No	BS 1377 Part 9 1990	-
-	Redox Potential of Soil	No	BS 1377 Part 9 1990	-
-	Determination of the Soil Infiltration Rate for Soakaway Design	No	BRE Digest 365 1991	-

In-Situ Plate Load Test Results

IN-SITU TESTING ENCLOSURE 1

ALLIED EXPLORATION & GEOTECHNICS LIMITED

In-Situ Plate Load Test

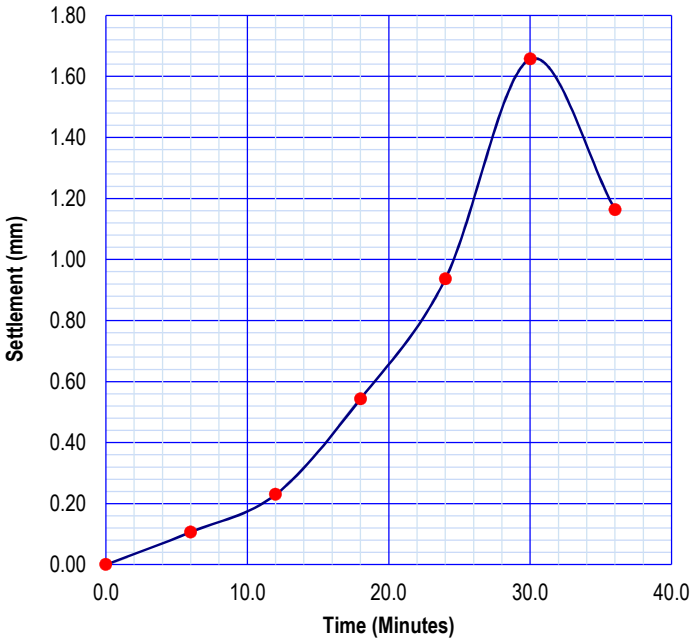
BS 1377 : Part 9 : 1990

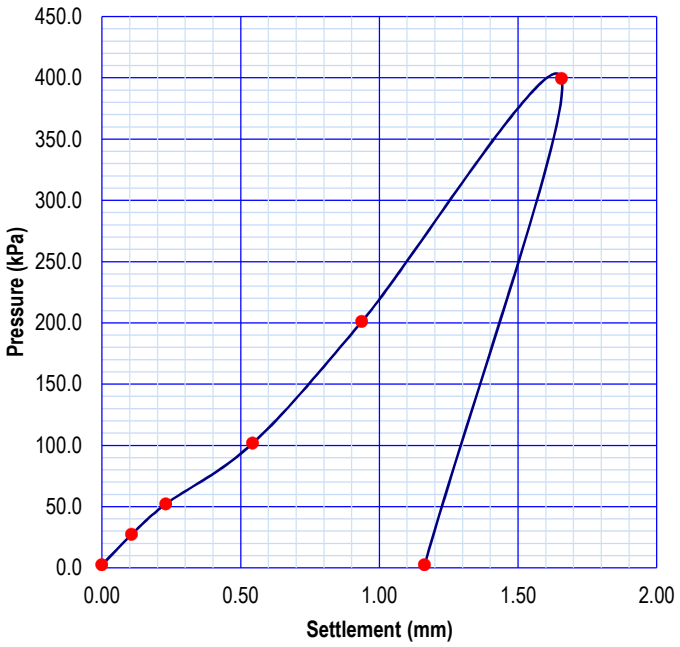
Unit 25 Stella Gill Industrial Estate Pelton Fell Chester-le-Street County Durham DH2 2RG.
Tel: 01913874700 Fax: 01913874710 email: enquiries@aeg.uk.net

Project Title:	**Metal Processing Area Shallow Soils Investigation**				
Client:	South Tees Development Corporation			**Project No.:**	4291
Test Position:	PLT-01 (BO)	**Depth (mBGL):**	0.00	**Operator:**	JM
Date of Test:	31/07/2020	**Plate Diameter (mm):**	453	**Plate Area (m2):**	0.16117
Reaction Load:	Tracked 360 (16T)			**Sample:**	No
Weather:	Clear and sunny			**Equipment Mass (Kg):**	38.90
Test Type:	Incremental - Pressure/Settlement			**Equipment Force (kN):**	0.382
Material Type:	MADE GROUND (Black gravelly sand.)				
Remarks:	Self weight of the equipment calculated at 0.38 kN (i.e. plate, extension rod, jack piston and load cell).				

Load Stage	Time	Force	Pressure	Av. Penetration	Av. Pene
	Minutes	kN	kPa	(mm)	mm/kPa
0	0.0	0.00	2.37	0.00	0.0000
1	6.0	4.00	27.19	0.11	0.0039
2	12.0	8.00	52.00	0.23	0.0044
3	18.0	16.00	101.64	0.54	0.0053
4	24.0	32.00	200.91	0.94	0.0047
5	30.0	64.00	399.46	1.66	0.0041
6	36.0	0.00	2.37	1.16	0.4914

Plate Penetration (mm):	1.25	**k762:**	150402.5	**kN/m2/m**
Plate Load @1.25mm (kPa):	300.00	**Equivalent CBR:**	**57.22**	**%**
Plate Factor:	0.6267	**Subgrade Mod (E):**	**234.60**	**MN/m2**
Penetration Comment:	1.25mm achieved at given pressure			





Certificate:	4291/PLT-01 (BO)	**End Remark:**	Tested in accordance with specification
Calculated:	Nick Vater	**Moisture Content:**	n/a %
Approved:	Nick Vater	**Test Certificate:**	**1 of 1**
Signed:	03/08/2020	**CBR Reference:**	Interim Advice Note 73/06 (2009)

ALLIED EXPLORATION & GEOTECHNICS LIMITED

In-Situ Plate Load Test

BS 1377 : Part 9 : 1990

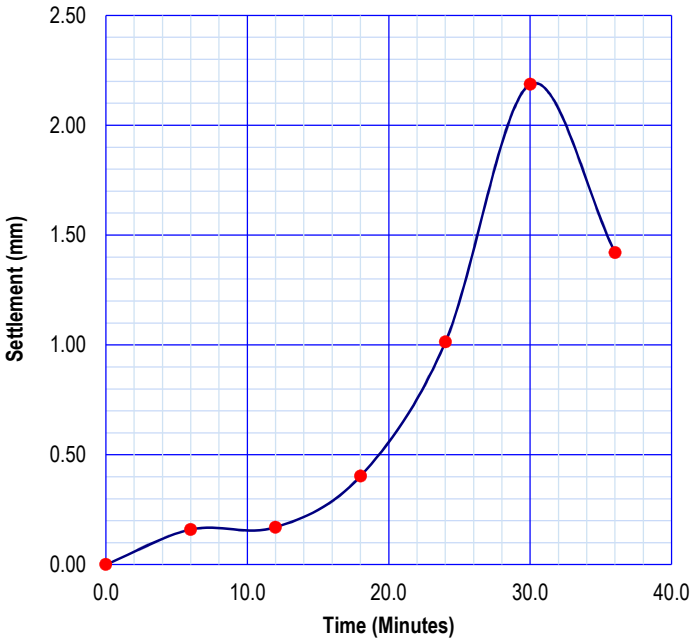
Unit 25 Stella Gill Industrial Estate Pelton Fell Chester-le-Street County Durham DH2 2RG.

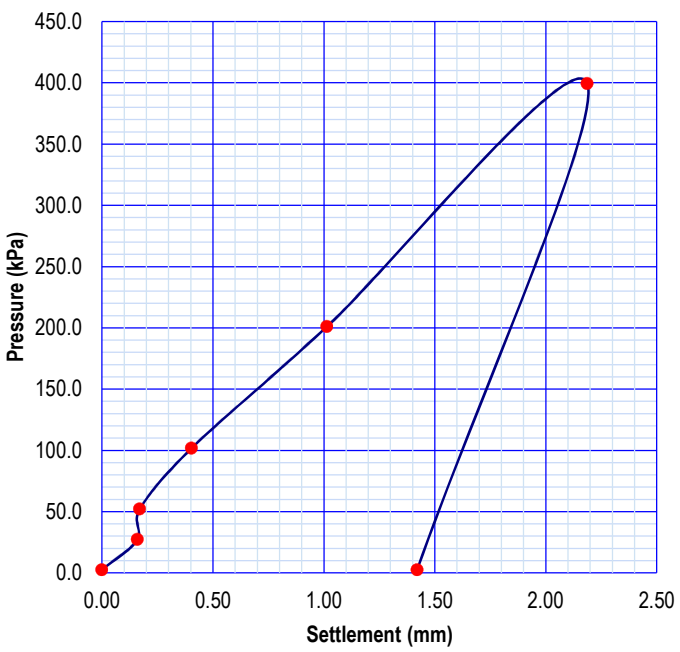
Tel: 01913874700 Fax: 01913874710 email: enquiries@aeg.uk.net

Project Title:	**Metal Processing Area Shallow Soils Investigation**				
Client:	South Tees Development Corporation			**Project No.:**	4291
Test Position:	PLT-02 (BO&M)	**Depth (mBGL):**	0.05	**Operator:**	JM
Date of Test:	31/07/2020	**Plate Diameter (mm):**	453	**Plate Area (m2):**	0.16117
Reaction Load:	Tracked 360 (16T)			**Sample:**	No
Weather:	Clear and sunny			**Equipment Mass (Kg):**	38.90
Test Type:	Incremental - Pressure/Settlement			**Equipment Force (kN):**	0.382
Material Type:	MADE GROUND (Grey sandy gravel.)				
Remarks:	Self weight of the equipment calculated at 0.38 kN (i.e. plate, extension rod, jack piston and load cell).				

Load Stage	Time	Force	Pressure	Av. Penetration	Av. Pene
	Minutes	kN	kPa	(mm)	mm/kPa
0	0.0	0.00	2.37	0.00	0.0000
1	6.0	4.00	27.19	0.16	0.0059
2	12.0	8.00	52.00	0.17	0.0033
3	18.0	16.00	101.64	0.40	0.0040
4	24.0	32.00	200.91	1.01	0.0050
5	30.0	64.00	399.46	2.19	0.0055
6	36.0	0.00	2.37	1.42	0.5999

Plate Penetration (mm):	1.25	**k762:**	122828.7	**kN/m2/m**
Plate Load @1.25mm (kPa):	245.00	**Equivalent CBR:**	**40.28**	**%**
Plate Factor:	0.6267	**Subgrade Mod (E):**	**187.40**	**MN/m2**
Penetration Comment:	1.25mm achieved at given pressure			





Certificate:	4291/PLT-02 (BO&M)	**End Remark:**	Tested in accordance with specification	
Calculated:	Nick Vater	**Moisture Content:**	n/a	**%**
Approved:	Nick Vater	**Test Certificate:**	**1 of 1**	
Signed:	03/08/2020	**CBR Reference:**	Interim Advice Note 73/06 (2009)	

ALLIED EXPLORATION & GEOTECHNICS LIMITED

In-Situ Plate Load Test

BS 1377 : Part 9 : 1990

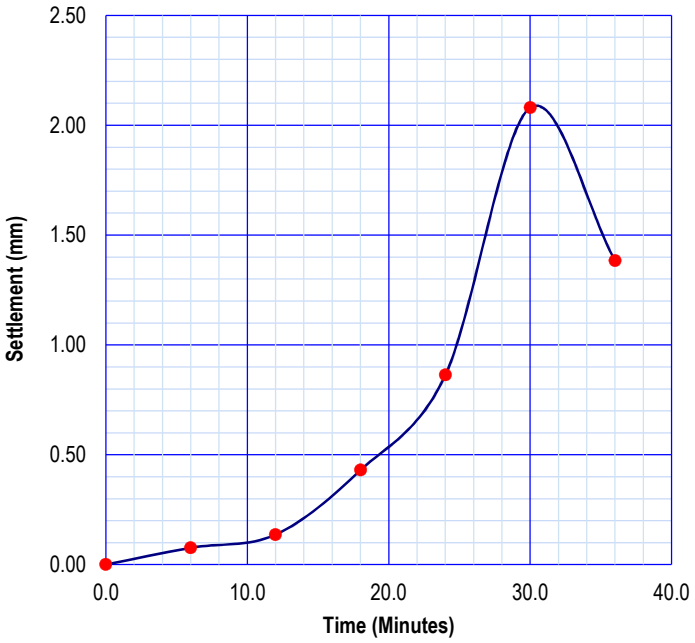
Unit 25 Stella Gill Industrial Estate Pelton Fell Chester-le-Street County Durham DH2 2RG.

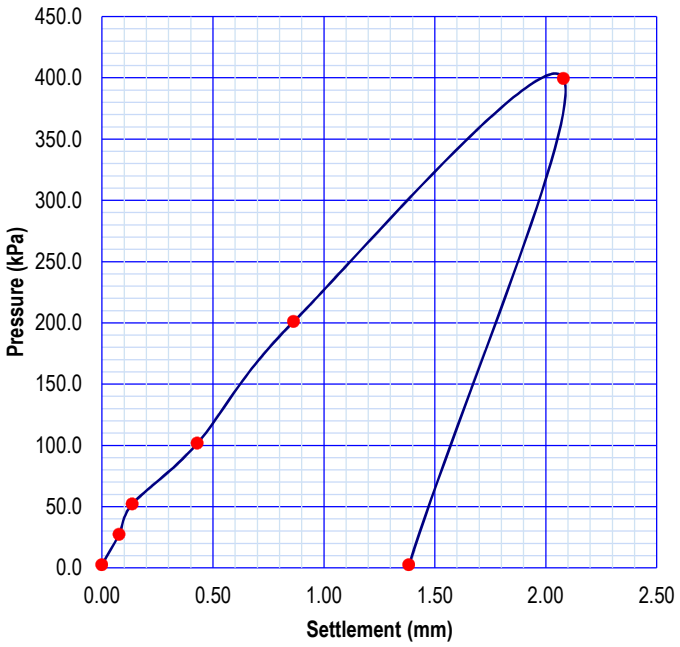
Tel: 01913874700 Fax: 01913874710 email: enquiries@aeg.uk.net

Project Title:	**Metal Processing Area Shallow Soils Investigation**				
Client:	South Tees Development Corporation			**Project No.:**	4291
Test Position:	PLT-03 (M)	**Depth (mBGL):**	0.05	**Operator:**	JM
Date of Test:	31/07/2020	**Plate Diameter (mm):**	453	**Plate Area (m2):**	0.16117
Reaction Load:	Tracked 360 (16T)			**Sample:**	No
Weather:	Clear and sunny			**Equipment Mass (Kg):**	38.90
Test Type:	Incremental - Pressure/Settlement			**Equipment Force (kN):**	0.382
Material Type:	MADE GROUND (Grey sandy gravel.)				
Remarks:	Self weight of the equipment calculated at 0.38 kN (i.e. plate, extension rod, jack piston and load cell).				

Load Stage	Time	Force	Pressure	Av. Penetration	Av. Pene
	Minutes	kN	kPa	(mm)	mm/kPa
0	0.0	0.00	2.37	0.00	0.0000
1	6.0	4.00	27.19	0.08	0.0028
2	12.0	8.00	52.00	0.14	0.0026
3	18.0	16.00	101.64	0.43	0.0042
4	24.0	32.00	200.91	0.86	0.0043
5	30.0	64.00	399.46	2.08	0.0052
6	36.0	0.00	2.37	1.38	0.5844

Plate Penetration (mm):	1.25	**k762:**	140375.6	**kN/m2/m**
Plate Load @1.25mm (kPa):	280.00	**Equivalent CBR:**	**50.77**	**%**
Plate Factor:	0.6267	**Subgrade Mod (E):**	**217.31**	**MN/m2**
Penetration Comment:	1.25mm achieved at given pressure			





Certificate:	4291/PLT-03 (M)	**End Remark:**	Tested in accordance with specification
Calculated:	Nick Vater	**Moisture Content:**	n/a %
Approved:	Nick Vater	**Test Certificate:**	**1 of 1**
Signed:	03/08/2020	**CBR Reference:**	Interim Advice Note 73/06 (2009)

Laboratory Report Certificate

LABORATORY TESTING ENCLOSURES

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham DH2 2RG - Tel: 0191 3874700 Fax: 0191 3874710
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn [illegible] - Tel: [illegible] Fax: [illegible]

LABORATORY REPORT CERTIFICATE

1367

Contract Title: Metal Processing Area Shallow Soils Investigation

AEG Reference: 4291

Client: South Tees Development Corporation

We certify that Laboratory testing was carried out on samples from the above contract in accordance with techniques outlined in BS 1377: 1990, BS EN ISO 17892:2014 or other appropriate standards as quoted. The samples were received from July 2020 and the following results, given on the attached enclosures, were obtained.

The tests carried out are indicated in the attached table showing the enclosure number and the total number of pages.

For and on behalf of Allied Exploration & Geotechnics Limited

- [ ] Nick Vater (Managing Director)
- [ ] Kevin Warriner (HSE & Quality Director)
- [x] Michelle Selkirk (Laboratory Manager)

Signed: MSelkirk

Date: 11 November 2020

Tests marked not UKAS accredited in this certificate are not included in the UKAS accreditation schedule for our laboratory. Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

Please note the material was derived from samples taken outside the control of the laboratory.

LABORATORY REPORT CERTIFICATE

ENCLOSURES

Enclosure Number	Description	UKAS Accredited	Reference	No. of Pages
0	Laboratory Report Certificate	N/A		3
1	Sample Description Sheets	N/A		5
2	Moisture Content	Yes	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)	2
2	Plasticity Index and Moisture Content	Yes	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)	1
3	Determination of Particle Density	Yes	BS 1377 Part 2 1990	1
4	Particle Size Distribution Sieving	Yes	BS 1377 Part 2 1990	48
4	Particle Size Distribution Sedimentation	No	BS 1377 Part 2 1990	7
5	Determination of Calorific Value, Total Sulphur, Sulphate and pH (Tested externally)	No	See DETS certificates	6
6	Determination of Dry Density/Moisture Content Relationship	Yes	BS 1377 Part 4 1990	12
7	Determination of California Bearing Ratio	Yes	BS 1377 Part 4 1990	3
8	Determination of Permeability in a Triaxial Cell	Yes	BS 1377 Part 6 1990	5
9	Determination of In-Situ Density Core Cutter Method	Yes	BS1377 Part 9 1990	1
10	Slag Analysis (Tested externally)	No		14

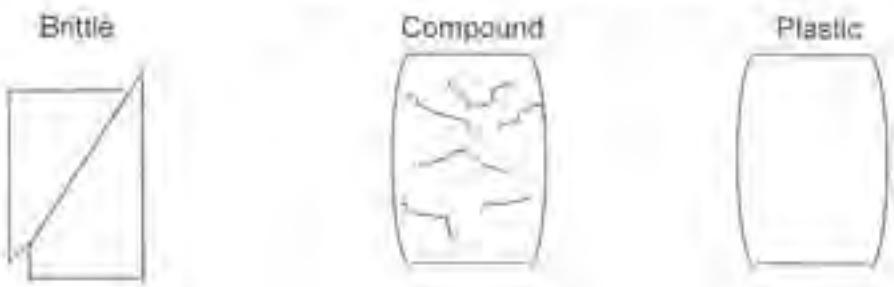
LABORATORY REPORT CERTIFICATE

ABBREVIATIONS

All the abbreviations used on the laboratory certificates are given below:

Br	Brittle	**PSD**	Particle Size Distribution by sieve analysis
C	Compound	**SB**	Shear Box
CBR	California Bearing Ratio	**SED**	Sedimentation Analysis
CDT	Consolidated Drained Triaxial	**SO4**	Sulphate (total, water extract, groundwater)
CL	Chloride content (water or soil)	**CP2**	Dry Density/Moisture Content 2.5kg rammer
US	Unsuitable sample for test	**CP4**	As above using 4.5kg rammer
UUT	Undrained Unconsolidated Triaxial	**CPV**	As above using vibrating hammer
HSV	Vane Test	**CUT**	Consolidated Undrained Triaxial
IS	Insufficient sample for test	**R**	Remoulded
LOI	Loss On Ignition	**U**	Undisturbed
M	Multi-stage testing	**MC**	Moisture Content
MCV	Moisture Content Value	**PL**	Point Load
NAT	Natural preparation method	**NMC**	Natural (or as received) moisture content
P	Plastic	**PFH**	Permeability Falling Head Method
OED	Oedometer	**PTXL**	Permeability in Triaxial Cell
OMC	Optimum Moisture Content	**ORG**	Organic content
B	Large disturbed (bulk) sample	**PD**	Particle Density (SG)
J	Small disturbed (jar) sample	**PI**	Liquid limit, plastic limit and plasticity index

Typical Mode of Failure for Triaxial Testing



Sample Description Sheets

LABORATORY TESTING ENCLOSURE 1

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: [illegible] Tel: [illegible] Fax: [illegible]
Regional Office: [illegible] Tel: [illegible] Fax: [illegible]

LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
BOS1	0.00	B	MADE GROUND (Black very clayey very sandy gravel of mudstone (Clay of low to intermediate plasticity)).	MC PI PSD SED CP2 PTXL
MPA_AUK_TP101	1.70	J4	MADE GROUND (Grey slightly sandy gravel of slag).	MC
MPA_AUK_TP101	2.40	LB6	MADE GROUND (Grey cobbles with much gravel of slag).	PSD US for CP4 & CBR
MPA_AUK_TP102A	2.10	LB6	MADE GROUND (Grey cobbles of slag).	PSD
MPA_AUK_TP103	0.60	J1	MADE GROUND (Brown gravelly sand. Gravel includes slag).	MC Calorific Value
MPA_AUK_TP103	1.50	J4	MADE GROUND (Brown gravelly sand).	MC
MPA_AUK_TP103	2.30	LB6	MADE GROUND (Grey cobbles of slag).	PSD US for CP4
MPA_AUK_TP104	2.40	LB6	MADE GROUND (Brown cobbles of slag).	PSD US for CP4
MPA_AUK_TP104	2.70	J7	MADE GROUND (Brown sandy gravel of slag).	MC
MPA_AUK_TP105	0.40	J1	MADE GROUND (Brown gravelly sand. Gravel includes slag).	MC Calorific Value
MPA_AUK_TP105	0.70	B2	MADE GROUND (Grey brown slightly clayey very sandy gravel including metal fragments).	PSD CP4
MPA_AUK_TP105	2.80	LB8	MADE GROUND (Grey cobbles with some gravel of slag).	PSD US for CP4 & CBR
MPA_AUK_TP105	3.60	J9	MADE GROUND (Grey slightly sandy gravel of slag).	MC
MPA_AUK_TP106	0.50	J1	MADE GROUND (Grey slightly sandy gravel of slag).	MC BRE Calorific Value
MPA_AUK_TP106	0.80	B2	MADE GROUND (Grey cobbles with much gravel of slag).	PSD US for CP4 & CBR
MPA_AUK_TP106	2.60	J7	MADE GROUND (Brown slightly sandy gravel of slag).	BRE Calorific Value
MPA_AUK_TP107	0.50	J1	MADE GROUND (Brown sandy gravel of slag).	MC Calorific Value
MPA_AUK_TP107	0.70	B2	MADE GROUND (Grey cobbles with some gravel of slag).	PSD US for CBR
MPA_AUK_TP108	0.60	J1	MADE GROUND (Brown sandy gravel of slag).	Calorific Value
MPA_AUK_TP108	1.60	J4	MADE GROUND (Brown sandy gravel of slag).	Calorific Value
MPA_AUK_TP109	2.60	LB6	MADE GROUND (Grey cobbles of slag).	PSD US for PD & CP4

Contract Title: Metal Processing Area Shallow Soils Investigation

Client: South Tees Development Corporation

Signed: mSone

Name: [illegible]

Date of issue: 05/11/2020

Certificate No: SD/4291/1

AEG Contract No: 4291

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
MPA_AUK_TP109	2.60	J7	MADE GROUND (Grey gravel of slag).	MC BRE
MPA_AUK_TP110	0.80	B2	MADE GROUND (Grey sandy gravel including slag and metal fragments).	PSD PD CP4
MPA_AUK_TP110	2.90	B8	MADE GROUND (Dark brown sandy gravel with a medium cobble content. Gravel includes slag and metal fragments).	PSD US for CP4
MPA_AUK_TP112	0.60	J1	MADE GROUND (Brown gravelly sand. Gravel includes plastic and slag).	MC
MPA_AUK_TP112	0.70	B2	MADE GROUND (Grey sandy gravel with a high cobble content of slag).	PSD US for CP4 & CBR
MPA_AUK_TP112	2.10	LB6	MADE GROUND (Grey cobbles with some gravel of slag).	PSD US for PD & CP4
MPA_AUK_TP112	2.60	J7	MADE GROUND (Brown slightly sandy gravel of slag).	MC Calorific Value
MPA_AUK_TP113	2.30	LB6	MADE GROUND (Brown clayey very sandy gravel with occasional clay pockets and a medium cobble content. Gravel includes slag).	PSD US for CP4
MPA_AUK_TP113	2.60	J7	MADE GROUND (Brown slightly sandy gravel of slag).	MC
MPA_AUK_TP113	3.80	B10	MADE GROUND (Grey cobbles with some gravel of slag).	PSD
MPA_AUK_TP114	2.30	J5	MADE GROUND (Brown slightly sandy gravel of slag).	MC
MPA_AUK_TP114	2.50	LB6	MADE GROUND (Grey cobbles with occasional gravel of slag).	PSD US for PD & CP4
MPA_AUK_TP115	0.40	J1	MADE GROUND (Grey sandy gravel of slag).	Calorific Value
MPA_AUK_TP115	0.50	B2	MADE GROUND (Grey clayey very sandy gravel).	PSD CP4 CBR
MPA_AUK_TP115	2.00	LB6	MADE GROUND (Grey cobbles with occasional gravel of slag).	PSD
MPA_AUK_TP116	1.40	J4	MADE GROUND (Brown slightly sandy gravel of slag).	MC BRE
MPA_AUK_TP116	1.60	B5	MADE GROUND (Grey gravel and cobbles of slag).	PSD US for PD
MPA_AUK_TP117	2.00	LB6	MADE GROUND (Grey cobbles with some gravel of slag).	PSD US for CP4 & CBR
MPA_AUK_TP117	2.30	J7	MADE GROUND (Reddish brown sandy gravel of slag).	MC
MPA_AUK_TP117	3.30	J9	MADE GROUND (Brown slightly sandy gravel of slag).	BRE Calorific Value
MPA_AUK_TP118	0.60	B2	MADE GROUND (Grey slightly clayey sandy gravel with a medium cobble content of slag).	PSD CBR

Contract Title :- Metal Processing Area Shallow Soils Investigation

Client :- South Tees Development Corporation

Signed :- [signature]

Name :-

Date of issue :- 05/11/2020

Certificate No :- SD/4291/2

AEG Contract No :- 4291

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LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
MPA_AUK_TP118	2.00	LB6	MADE GROUND (Grey cobbles with some gravel of slag).	PSD
MPA_AUK_TP118	2.80	J7	MADE GROUND (Grey slightly sandy gravel of slag).	MC
MPA_AUK_TP119	0.80	B2	MADE GROUND (Brown clayey very sandy gravel of slag with occasional rootlets).	PSD CBR
MPA_AUK_TP119	1.40	J4	MADE GROUND (Grey slightly sandy gravel of slag).	Calorific Value
MPA_AUK_TP119	2.70	J7	MADE GROUND (Grey slightly sandy gravel of slag).	MC
MPA_AUK_TP119	3.00	LB8	MADE GROUND (Grey cobbles with some gravel).	PSD US for CP4
MPA_AUK_TP120	0.60	B2	MADE GROUND (Grey cobbles with some gravel of slag).	PSD US for CBR
MPA_AUK_TP120	2.00	LB6	MADE GROUND (Grey cobbles of slag).	PSD
MPA_AUK_TP120	3.60	J9	MADE GROUND (Grey slightly sandy gravel of slag).	BRE
MPA_AUK_TP120	3.60	B10	MADE GROUND (Grey cobbles of slag).	PSD
MPA_AUK_TP121	2.00	J4	MADE GROUND (Brown gravelly sand. Gravel includes slag).	MC
MPA_AUK_TP121	2.50	LB6	MADE GROUND (Grey cobbles of slag).	PSD US for PD CP4 & CBR
MPA_AUK_TP122	1.40	J4	MADE GROUND (Brown sandy gravel of slag).	MC
MPA_AUK_TP122	1.70	B5	MADE GROUND (Grey cobbles with some gravel of slag).	PSD US for CP4
MPA_AUK_TP122	2.80	LB7	MADE GROUND (Brown and grey cobbles with some gravel of slag).	PSD
MPA_AUK_TP123	2.30	LB6	MADE GROUND (Grey cobbles with some gravel of slag).	PSD US for CBR
MPA_AUK_TP124	1.60	B5	MADE GROUND (Grey and brown cobbles with occasional gravel of slag).	PSD
MPA_AUK_TP124	3.70	J9	MADE GROUND (Brown sandy gravel of slag).	BRE
MPA_AUK_TP125	1.90	J4	MADE GROUND (Brown gravelly sand. Gravel includes slag).	MC
MPA_AUK_TP125	2.40	LB6	MADE GROUND (Grey cobbles with some gravel of slag).	PSD US for CP4 & CBR
MPA_AUK_TP125	3.90	J9	MADE GROUND (Brown sandy gravel of slag).	MC

Contract Title :
Metal Processing Area Shallow Soils Investigation

Client :
South Tees Development Corporation

Signed : msono	Name :		Page 3 of 5
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LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
MPA_AUK_TP125	4.20	B10	MADE GROUND (Grey cobbles with some gravel).	PSD
MPA_AUK_TP126	0.40	J1	MADE GROUND (Brown sandy gravel of slag).	MC BRE
MPA_AUK_TP126	0.60	B2	MADE GROUND (Grey cobbles with some gravel of slag).	PSD US for CBR
MPA_AUK_TP127	0.40	J1	MADE GROUND (Grey sandy gravel of slag).	Calorific Value
MPA_AUK_TP127	0.60	B2	MADE GROUND (Brown sandy gravel including slag and metal fragments).	PSD US for CP4 & CBR
MPA_AUK_TP127	1.60	J4	MADE GROUND (Grey sandy gravel of slag).	Calorific Value
MPA_AUK_TP128	0.40	J1	MADE GROUND (Brown slightly gravelly sand. Gravel includes metal fragments).	MC BRE
MPA_AUK_TP128	0.60	B2	MADE GROUND (Dark grey clayey very gravelly sand. Gravel includes metal fragments).	PSD PD CP4
MPA_AUK_TP128	3.00	LB8	MADE GROUND (Grey cobbles with some gravel of slag).	PSD
MPA_AUK_TP128	3.60	J9	MADE GROUND (Grey slightly sandy gravel of slag).	MC Calorific Value US for PI
MPA_AUK_TP130	0.20	J1	MADE GROUND (Brown sandy gravel of slag).	MC US for PI
MPA_AUK_TP130	0.30	B2	MADE GROUND (Brown slightly sandy gravel and cobbles of slag and brick fragments).	PSD PD US for CP4
MPA_AUK_TP130	1.20	J4	MADE GROUND (Brown sandy gravel of slag).	MC
MPA_AUK_TP130	1.30	B5	MADE GROUND (Brown and grey slightly clayey sandy gravel with high cobble content of slag and metal fragments).	PSD PD
Stockpile	0.00	B1	MADE GROUND (Grey clayey very sandy gravel of mudstone. (Clay of low plasticity)).	MC PI PSD SED BRE CP2 PTXL
Stockpile	0.00	C1	MADE GROUND (Grey clayey very sandy gravel of mudstone).	MC Density US for HSV & PTXL
Stockpile	0.00	B2	MADE GROUND (Grey clayey sandy gravel of mudstone. (Clay of low plasticity)).	MC PI PSD PD BRE CP2 PTXL
Stockpile	0.00	C2	MADE GROUND (Grey clayey very sandy gravel of mudstone).	MC Density PSD SED PD US for HSV & PTXL
Stockpile	0.00	B3	MADE GROUND (Grey clayey very sandy gravel of mudstone. (Clay of low plasticity)).	MC PI PSD SED BRE CP2 PTXL
Stockpile	0.00	C3	MADE GROUND (Grey clayey very sandy gravel of mudstone).	MC US for Density, HSV & PTXL
Stockpile	0.00	B4	MADE GROUND (Grey very clayey very sandy gravel of mudstone. (Clay of low plasticity)).	MC PI PSD SED CP2 PTXL

Contract Title :- Metal Processing Area Shallow Soils Investigation

Client :- South Tees Development Corporation

Signed: msono

Name :

Date of issue :- 05/11/2020

Certificate No :- SD4291/4

AEG Contract No. :- 4291

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LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
Stockpile	0.00	C4	MADE GROUND (Grey very clayey very sandy gravel of mudstone).	MC Density US for PTXL
Stockpile	0.00	B5	MADE GROUND (Grey very clayey very sandy gravel of mudstone (Clay of low plasticity))	MC PI PSD SED CP2 PTXL
Stockpile	0.00	C5	MADE GROUND (Grey very clayey very sandy gravel of mudstone).	MC Density US for PTXL
Stockpile	0.00	B6	MADE GROUND (Grey clayey very sandy gravel of mudstone. (Clay of low plasticity)).	MC PI PSD SED CP2 PTXL
Stockpile	0.00	C6	MADE GROUND (Grey clayey very sandy gravel of mudstone).	MC Density US for PTXL

LABORATORY TESTING ENCLOSURE 2

Moisture Content/Plasticity Index and Moisture Content

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT CERTIFICATE

BS 1377 / Part 2 / Clause 3.2

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Moisture Content (%)	Date Tested	Remarks
MPA_AUK_TP101	1.70	J4	1.70	7.2	18/09/2020	
MPA_AUK_TP103	0.60	J1	0.60	8.8	22/09/2020	
MPA_AUK_TP103	1.50	J4	1.50	8.5	22/09/2020	
MPA_AUK_TP104	2.70	J7	2.70	7.7	22/09/2020	
MPA_AUK_TP105	0.40	J1	0.40	17.8	22/09/2020	
MPA_AUK_TP105	3.60	J9	3.60	10.2	18/09/2020	
MPA_AUK_TP106	0.50	J1	0.50	6.9	18/09/2020	
MPA_AUK_TP107	0.50	J1	0.50	6.3	22/09/2020	
MPA_AUK_TP109	2.60	J7	2.60	7.4	22/09/2020	
MPA_AUK_TP112	0.60	J1	0.60	8.6	18/09/2020	
MPA_AUK_TP112	2.60	J7	2.60	8	18/09/2020	
MPA_AUK_TP113	2.60	J7	2.60	15.3	22/09/2020	
MPA_AUK_TP114	2.30	J5	2.30	8	18/09/2020	
MPA_AUK_TP116	1.40	J4	1.40	11.9	18/09/2020	
MPA_AUK_TP117	2.30	J7	2.30	10.4	18/09/2020	
MPA_AUK_TP118	2.80	J7	2.80	14.8	22/09/2020	
MPA_AUK_TP119	2.70	J7	2.70	3.1	22/09/2020	
MPA_AUK_TP121	2.00	J4	2.00	9.6	22/09/2020	
MPA_AUK_TP122	1.40	J4	1.40	9.3	18/09/2020	
MPA_AUK_TP125	1.90	J4	1.90	15.9	22/09/2020	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation

Client :- South Tees Development Corporation

Signed :- (signature)

Name :-

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Date of Issue :- 05/11/2020

Certificate No :- MC/4291/1

AEG Contract No. :- 4291

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: [illegible] Tel: [illegible] Fax: [illegible]
Regional Office: [illegible] Tel: [illegible] Fax: [illegible]

MOISTURE CONTENT CERTIFICATE

BS 1377 : Part 2 : Clause 3.2

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Moisture Content (%)	Date Tested	Remarks
MPA_AUK_TP125	3.90	J9	3.90	12.1	22/09/2020	
MPA_AUK_TP129	0.40	J1	0.40	8.1	22/09/2020	
MPA_AUK_TP128	0.40	J1	0.40	7.2	18/09/2020	
MPA_AUK_TP126	3.60	J9	3.60	20.9	18/09/2020	
MPA_AUK_TP130	0.20	J1	0.20	7	18/09/2020	
MPA_AUK_TP130	1.20	J4	1.20	6.8	22/09/2020	
Stockpile	0.00	C3	0.00	5.9	10/07/2020	

For description of sample please refer to the Laboratory Sample Description Sheet

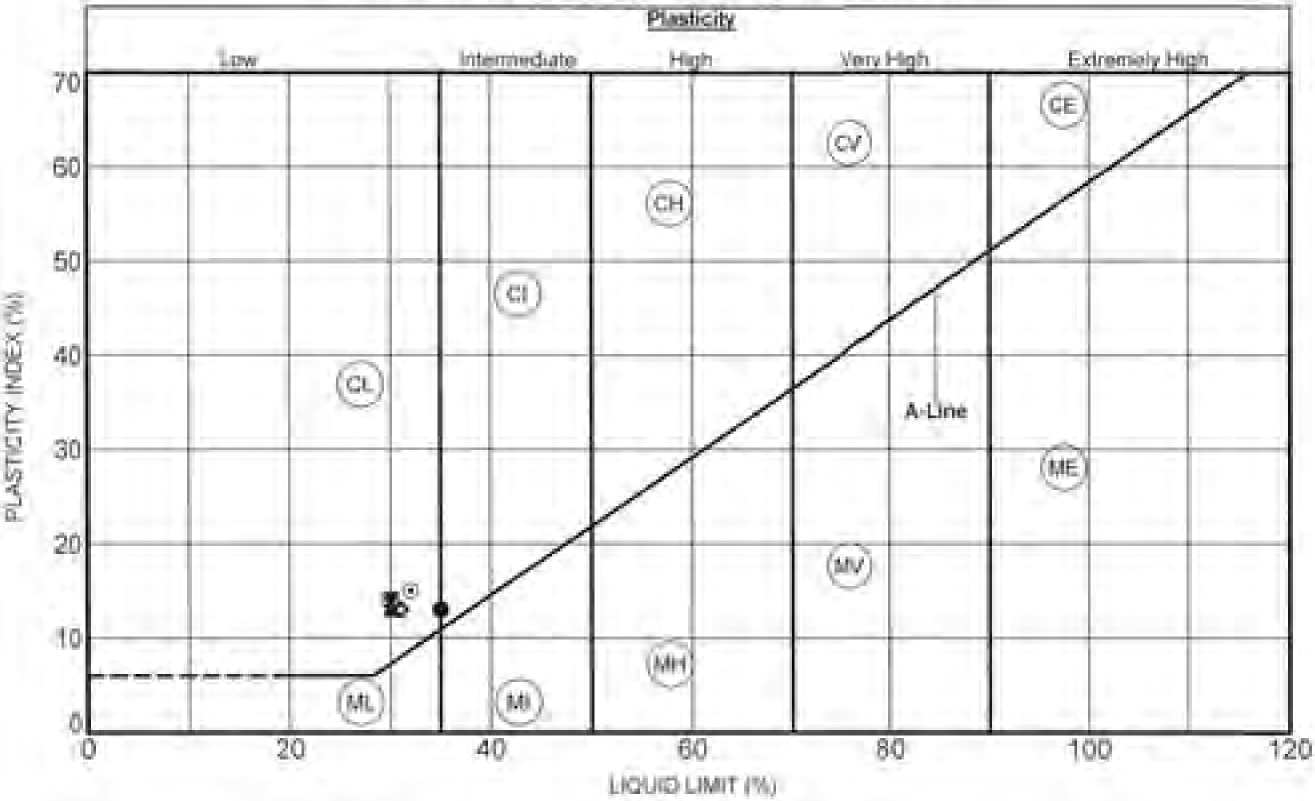
Contract Title :-	Client :-
Metal Processing Area Shallow Soils Investigation	South Tees Development Corporation

Signed :- MSone	Name :-	Page 2 of 2	UKAS TESTING 1367
Date of issue :- 05/11/2020	Certificate No :- MC/4291/2	AEG Contract No :- 4291	

ALLIED EXPLORATION & GEOTECHNICS LIMITED

ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method - BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	I_L	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested	
● BOS1	0.00	B	0.00	35	22	13	-0.74	Air Dried	40.0	12.4	17/07/2020	
Stockpile	0.00	B1	0.00	30	16	14	-0.73	Air Dried	24.0	5.8	14/07/2020	#
▲ Stockpile	0.00	B2	0.00	30	17	13	-0.92	Air Dried	15.0	5.1	14/07/2020	#
★ Stockpile	0.00	B3	0.00	30	16	14	-0.69	Air Dried	27.0	6.4	14/07/2020	#
⊙ Stockpile	0.00	B4	0.00	32	17	15	-0.64	Air Dried	38.0	7.4	17/07/2020	#
✪ Stockpile	0.00	B5	0.00	31	18	13	-0.72	Air Dried	36.0	8.8	17/07/2020	
○ Stockpile	0.00	B6	0.00	32	17	15	-0.60	Air Dried	22.0	8.0	17/07/2020	#

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI
If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :-	Client :-
Metal Processing Area Shallow Soils Investigation	South Tees Development Corporation

Signed :-	Name :-	Page 1 of 1
Date of issue :- 05/11/2020	Certificate No :- PI/4291/1	AEG Contract No. :- 4291

UKAS TESTING 1367

Determination of Particle Density

LABORATORY TESTING ENCLOSURE 3

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 2, [illegible] Tel: [illegible] Fax: [illegible]
Regional Office: Unit 10, [illegible] Tel: [illegible]

DETERMINATION OF PARTICLE DENSITY

BS1377 : Part 2 : Clause 6.2 : 1990

Exploratory Hole No.	Depth (m)	Sample Type & No.	Specific Depth (m)	Particle Density (Mg/m^3)	Date Tested
MPA_AUK_TP110	0.80	B2	0.80	3.36	24/09/2020
MPA_AUK_TP128	0.60	B2	0.60	4.50	24/09/2020
MPA_AUK_TP130	0.30	B2	0.30	3.25	24/09/2020
MPA_AUK_TP130	1.30	B5	1.30	3.27	23/09/2020
Stockpile	0.00	B2	0.00	2.71	23/07/2020
Stockpile	0.00	C2	0.00	2.78	27/07/2020

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation

Client :- South Tees Development Corporation

Signed :- [signature]

Name :- [illegible]

Date of issue :- 05/11/2020

Certificate No :- PD/4291/1

AEG Contract No :- 4291

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Particle Size Distribution Sieving and Sedimentation

LABORATORY TESTING ENCLOSURE 4

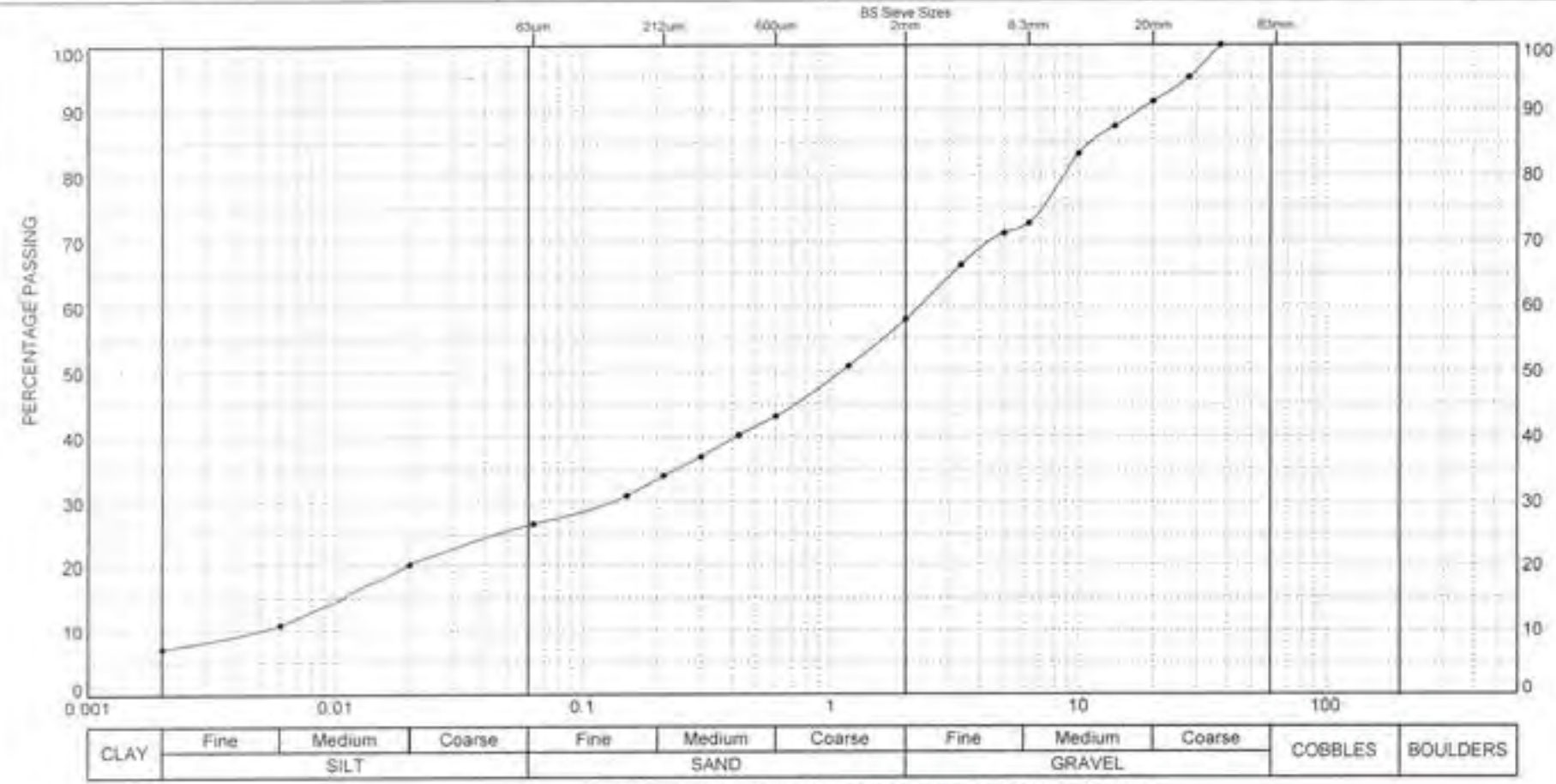
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 2C, Business Development Centre, Earsam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 302 Fax: 01772 735 668

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- **BOS1**	Depth (m) :- **0.00**	Sample Type & No :- **B**	Specific Depth (m) :- **0.00**	Date Tested :- **17/07/2020**



Sieve Size (mm)	Passing (%)
37.5	100.0
28	95.0
20	91.3
14	87.5
10	83.3
6.3	72.7
5	71.2
3.35	66.3
2	58.0
1.18	50.9
0.6	43.2
0.425	40.3
0.3	37.0
0.212	34.1
0.15	31.0
0.063	26.7
0.02	20.1
0.006	10.9
0.002	7.2

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/BOS1/B/0.00	MSene	M. SELNIAK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

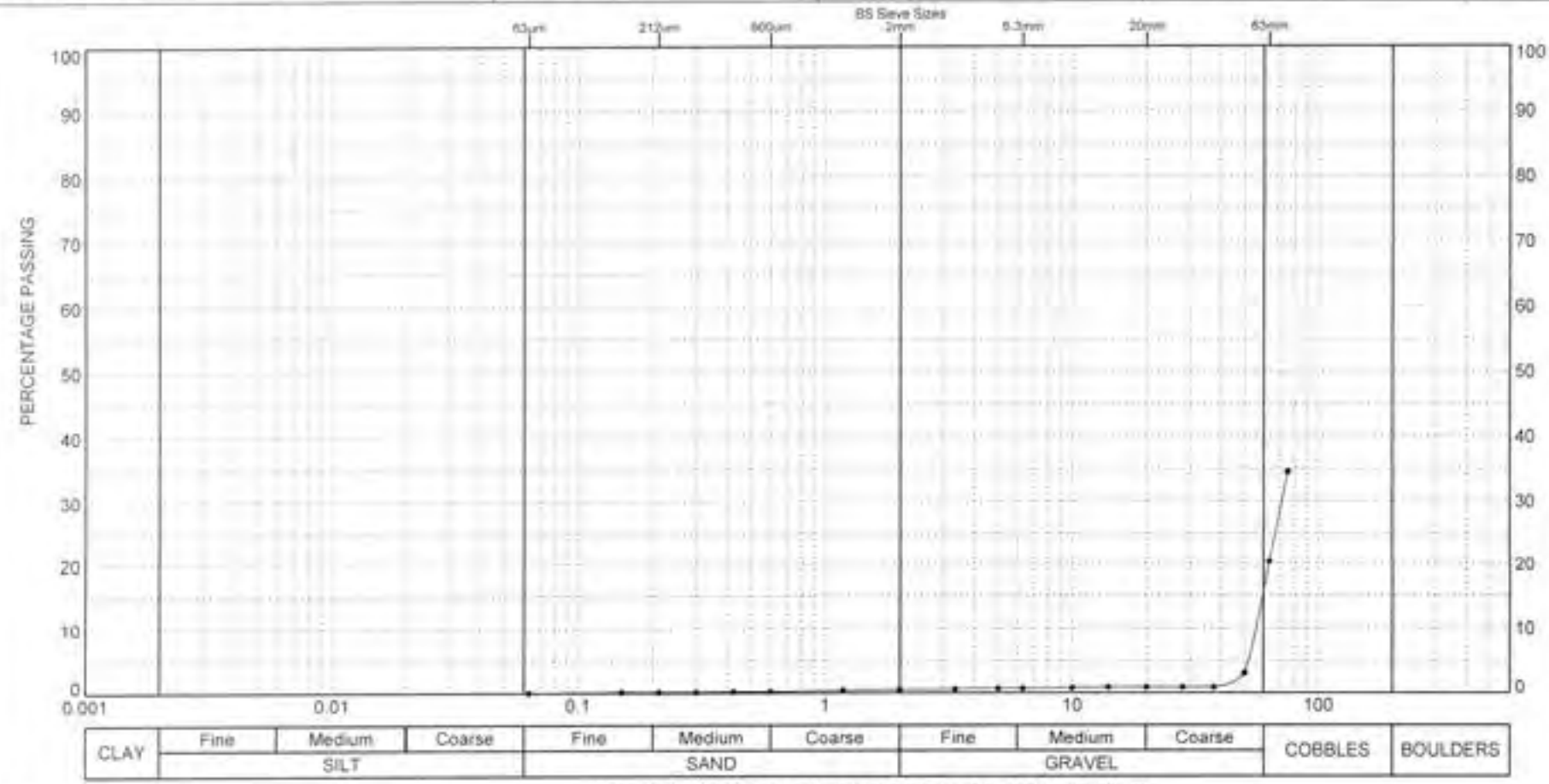
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4716
Regional Office: Unit 20, Business Development Centre, Eastern Wharf, Blackburn, BB1 5BL - Tel: 01772 735 309 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP101	**2.40**	**LB6**	**2.40**	**21/09/2020**



Sieve Size (mm)	Passing (%)
75	34.6
63	20.4
50	3.1
37.5	0.9
28	0.9
20	0.9
14	0.9
10	0.8
6.3	0.7
5	0.7
3.35	0.6
2	0.5
1.18	0.4
0.6	0.2
0.425	0.2
0.3	0.1
0.212	0.1
0.15	0.1
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP101/LB6/2.40	mseve	SEEKIRK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

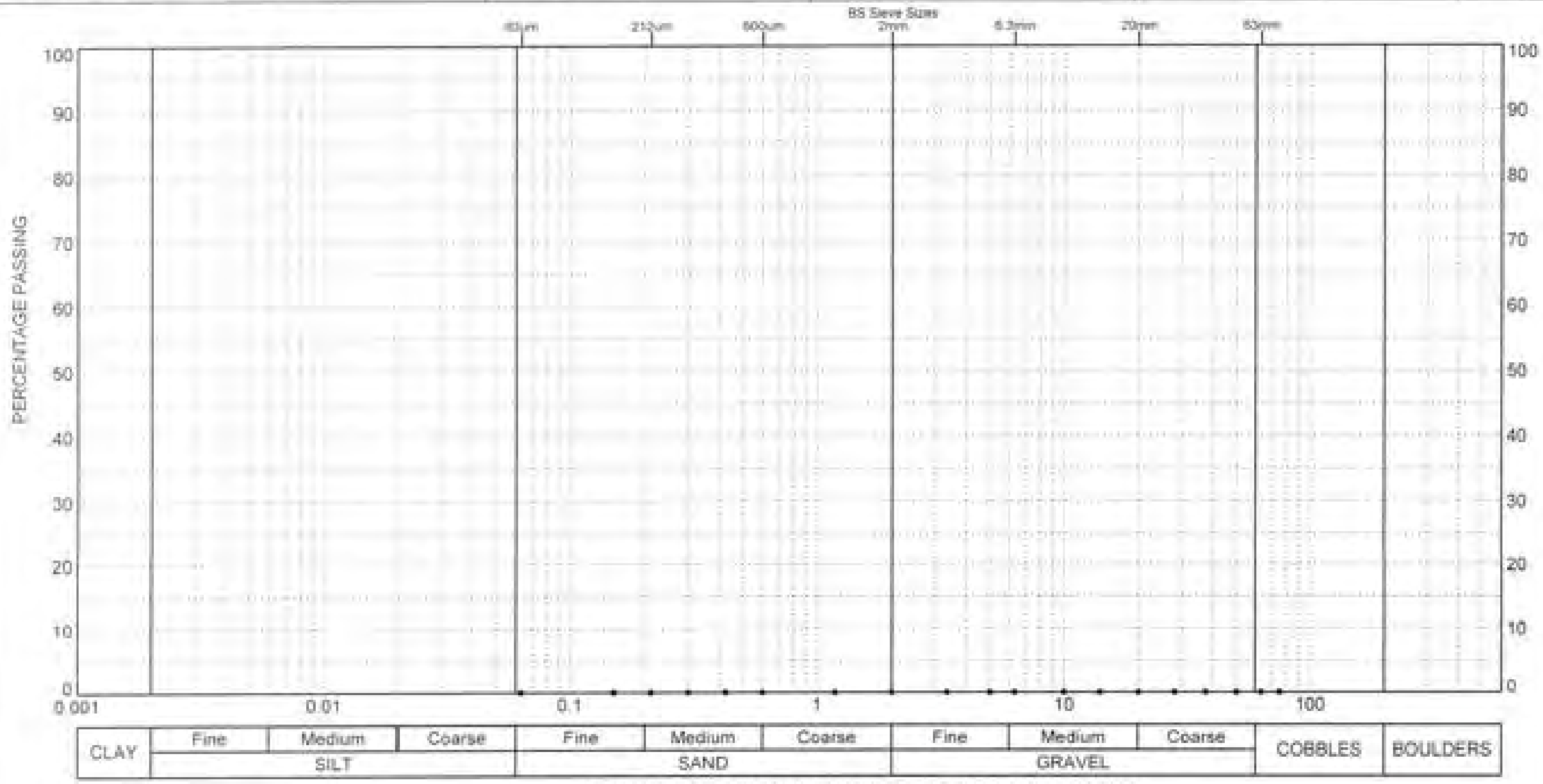
UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- **MPA_AUK_TP102A**	Depth (m) :- **2.10**	Sample Type & No :- **LB6**	Specific Depth (m) :- **2.10**	Date Tested :- **18/09/2020**



Sieve Size (mm)	Passing (%)
75	0.0
63	0.0
50	0.0
37.5	0.0
28	0.0
20	0.0
14	0.0
10	0.0
6.3	0.0
5	0.0
3.35	0.0
2	0.0
1.18	0.0
0.6	0.0
0.425	0.0
0.3	0.0
0.212	0.0
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 05/11/2020	Certificate No :- PSD/4291/MPA_AUK_TP102A/LB6/2.10	Signed :-	Name :-	Page 1 of 1
Client :- South Tees Development Corporation	Contract Title :- Metal Processing Area Shallow Soils Investigation			AEG Contract No :- 4291

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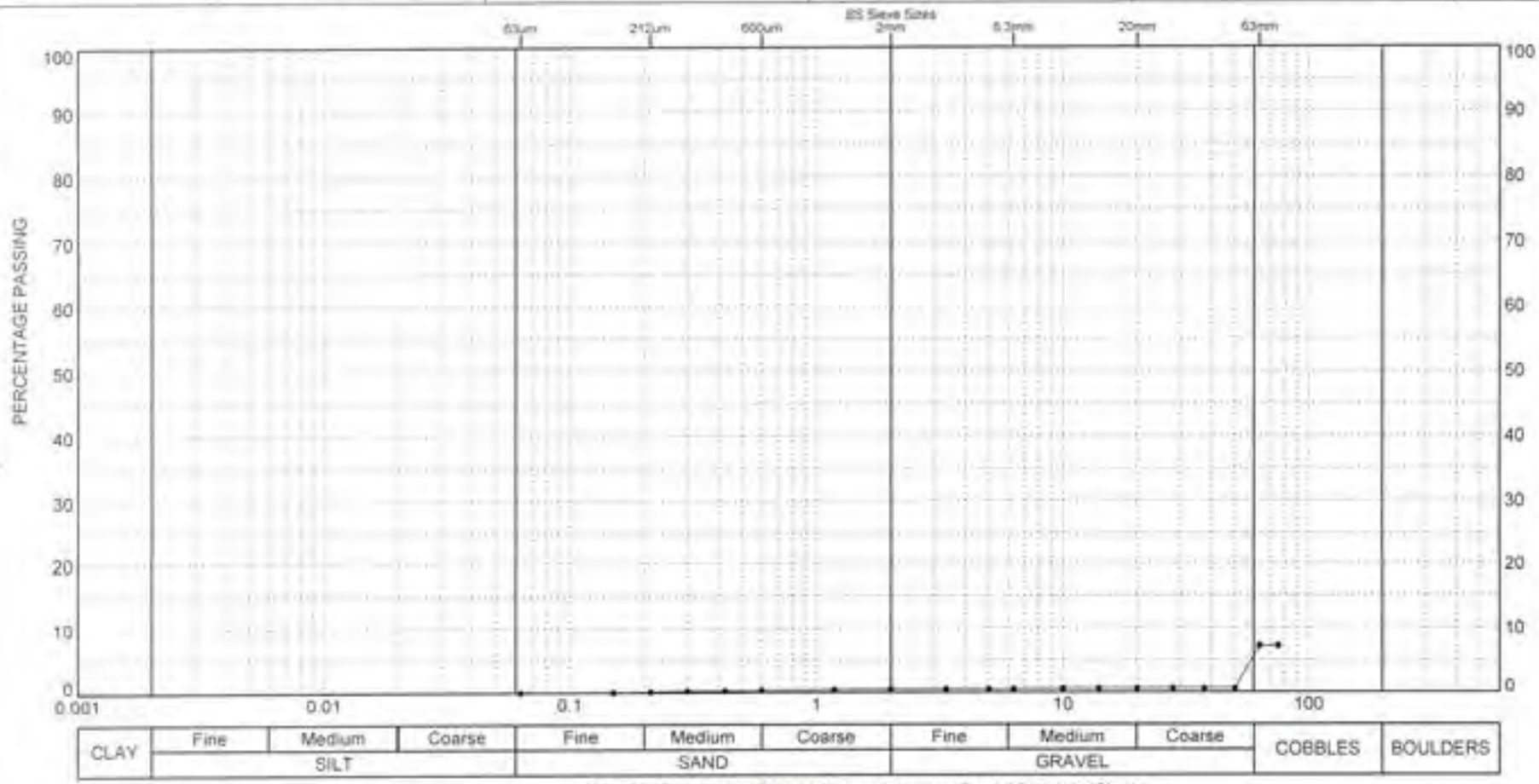
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP103	2.30	LB6	2.30	18/09/2020



Sieve Size (mm)	Passing (%)
75	7.2
63	7.2
50	0.6
37.5	0.6
28	0.6
20	0.6
14	0.6
10	0.6
6.3	0.5
5	0.5
3.35	0.5
2	0.5
1.18	0.4
0.6	0.3
0.425	0.2
0.3	0.2
0.212	0.1
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP103/LB6/2.30			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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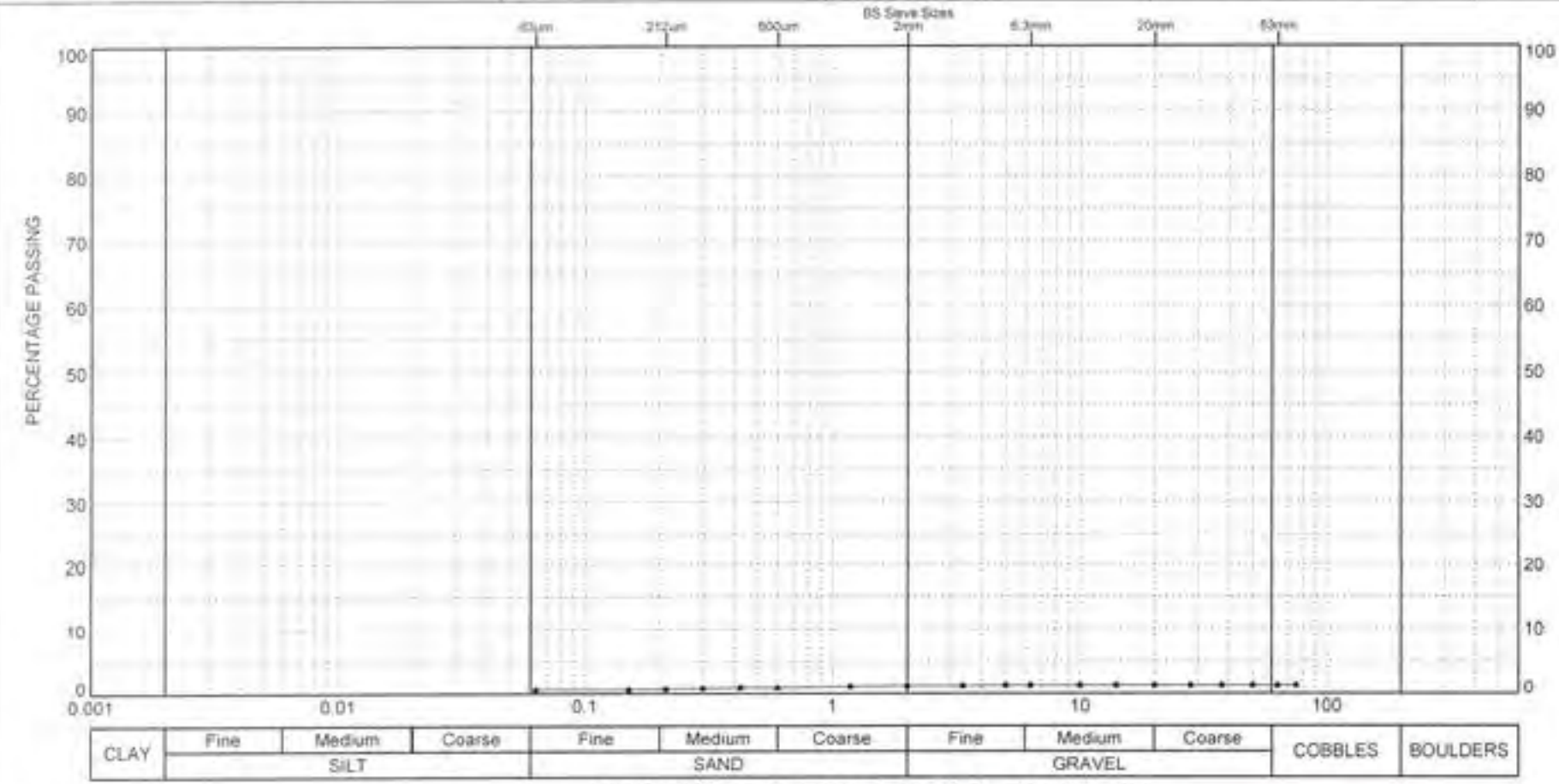
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP104	2.40	LB6	2.40	22/09/2020



Sieve Size (mm)	Passing (%)
75	1.3
63	1.3
50	1.3
37.5	1.3
28	1.3
20	1.3
14	1.3
10	1.3
6.3	1.3
5	1.3
3.35	1.2
2	1.2
1.18	1.1
0.6	0.9
0.425	0.9
0.3	0.8
0.212	0.7
0.15	0.6
0.063	0.6

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP104/LB6/2.40			

Client :-	Contract Title :-	AEG Contract No :-
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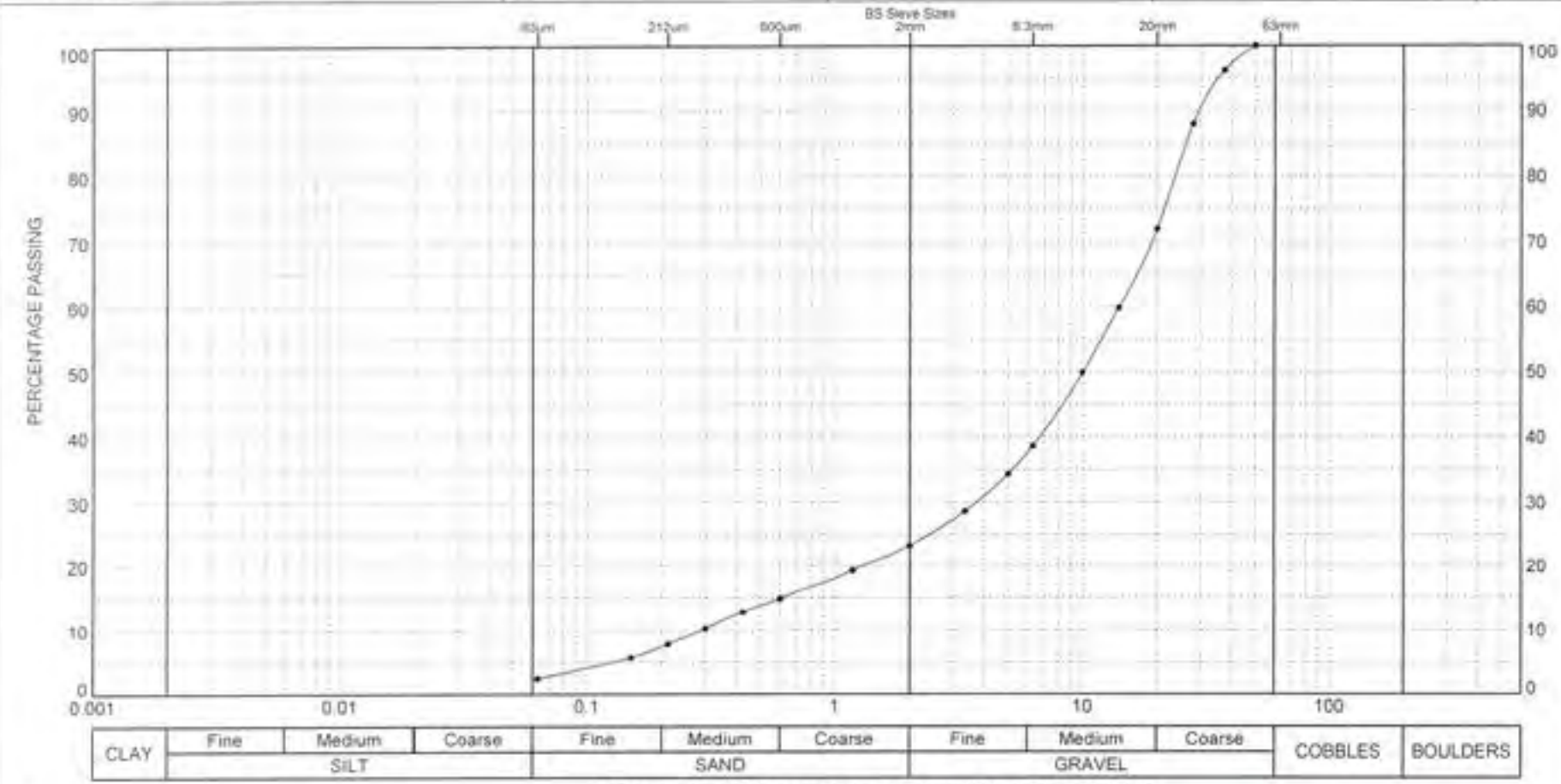
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP105	0.70	B2	0.70	23/09/2020



Sieve Size (mm)	Passing (%)
50	100.0
37.5	96.2
28	88.0
20	72.0
14	59.9
10	49.9
6.3	38.7
5	34.4
3.35	28.7
2	23.4
1.18	19.3
0.6	14.9
0.425	12.8
0.3	10.3
0.212	7.8
0.15	5.8
0.063	2.5

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP105/B2/0.70			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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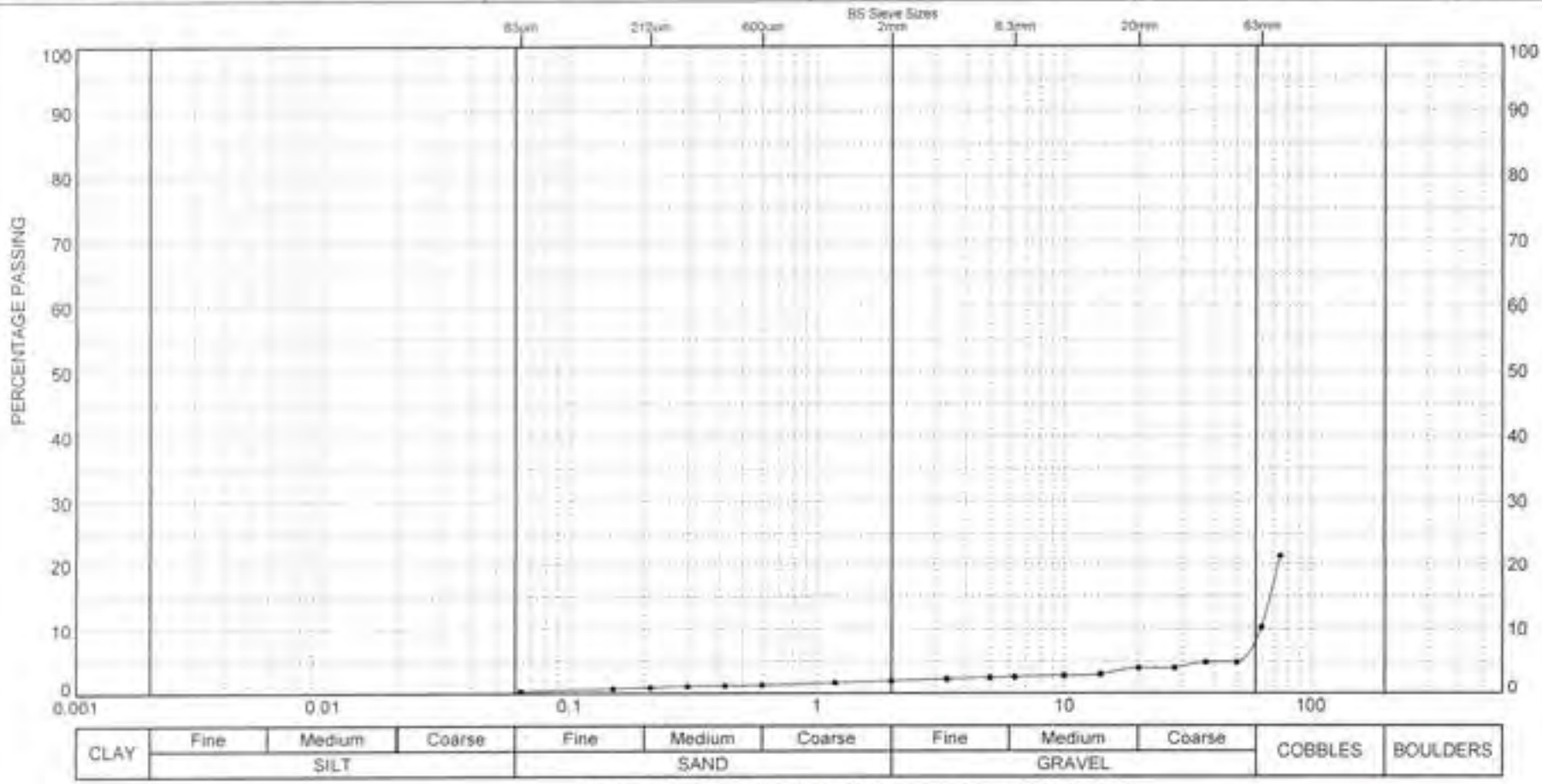
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP105	2.80	LB8	2.80	22/09/2020



Sieve Size (mm)	Passing (%)
75	21.5
63	10.3
50	4.8
37.5	4.8
28	3.9
20	3.9
14	3.0
10	2.8
6.3	2.6
5	2.5
3.35	2.3
2	2.0
1.18	1.7
0.6	1.3
0.425	1.2
0.3	1.1
0.212	0.9
0.15	0.7
0.063	0.3

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP105/LB8/2.80	MSone		

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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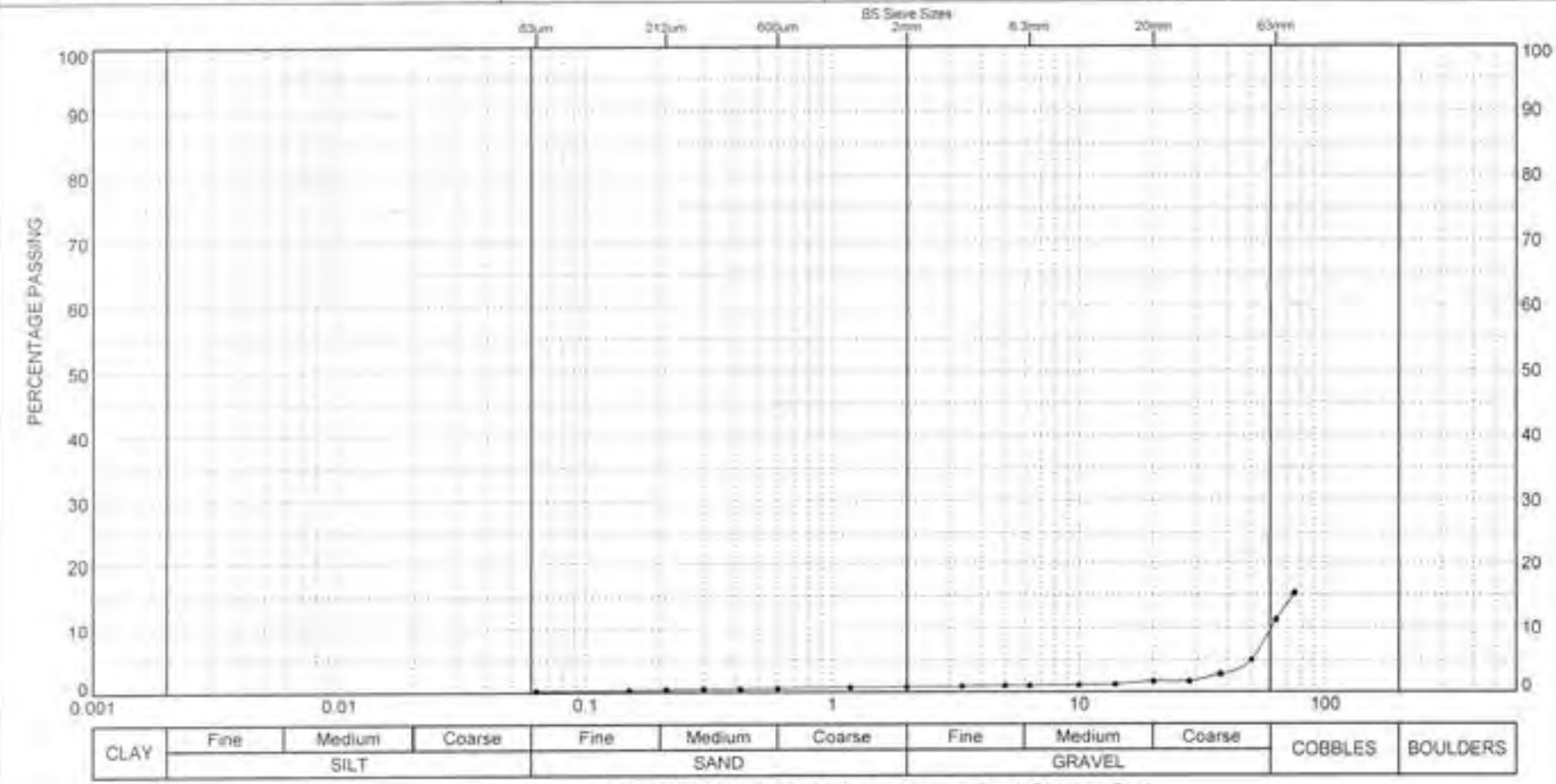
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP106	0.80	B2	0.80	21/09/2020



Sieve Size (mm)	Passing (%)
75	15.3
63	11.2
50	5.0
37.5	2.8
28	1.7
20	1.7
14	1.2
10	1.1
6.3	1.0
5	1.0
3.35	0.9
2	0.8
1.18	0.7
0.6	0.6
0.425	0.5
0.3	0.5
0.212	0.4
0.15	0.3
0.063	0.2

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP106/B2/0.80	MSone	[illegible]	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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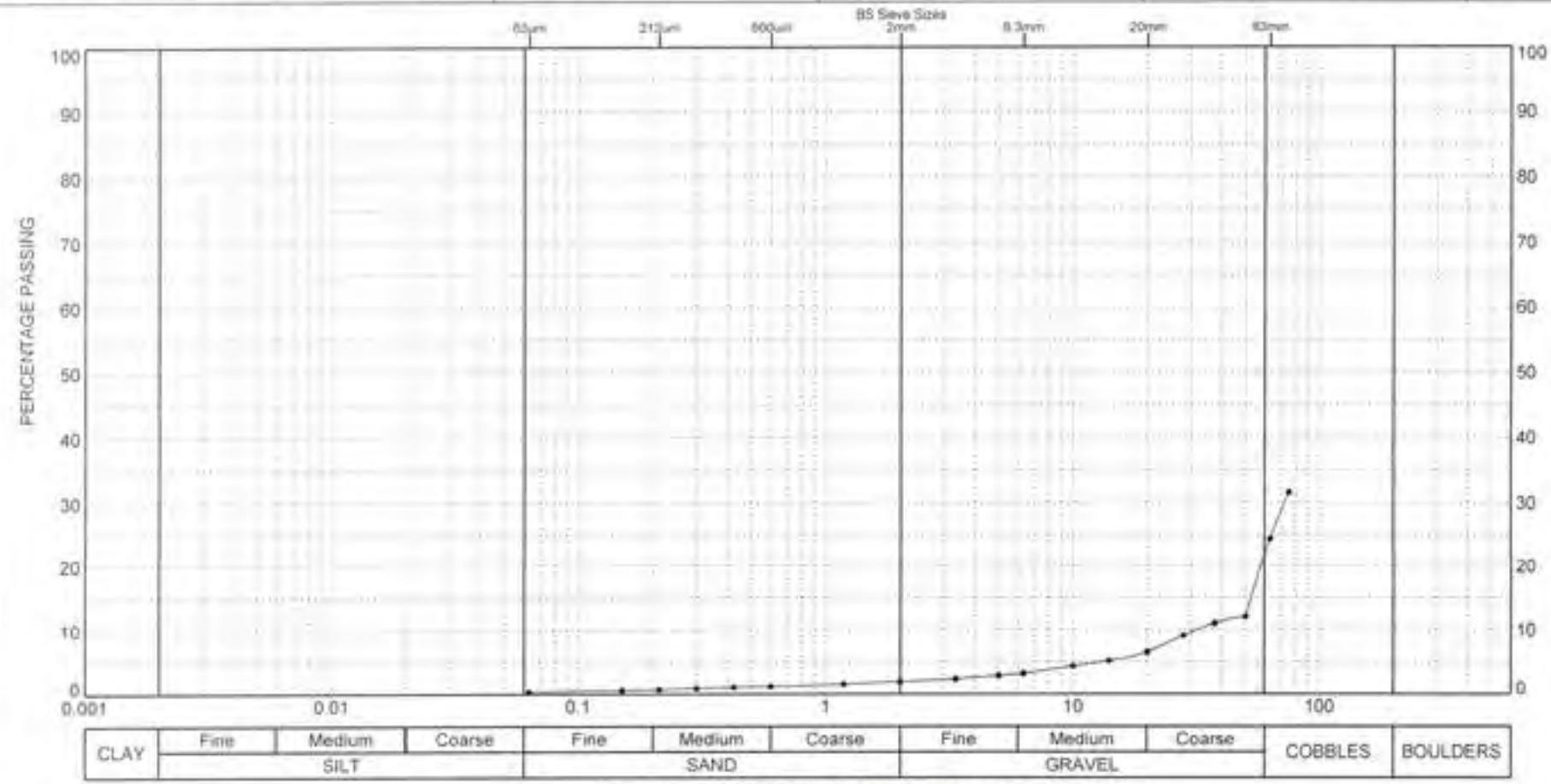
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 ; Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- **MPA_AUK_TP107**	Depth (m) :- **0.70**	Sample Type & No :- **B2**	Specific Depth (m) :- **0.70**	Date Tested :- **24/09/2020**



Sieve Size (mm)	Passing (%)
75	31.6
63	24.5
50	12.0
37.5	11.0
28	9.1
20	6.6
14	5.2
10	4.3
6.3	3.2
5	2.9
3.35	2.4
2	2.0
1.18	1.6
0.6	1.2
0.425	1.1
0.3	0.9
0.212	0.7
0.15	0.6
0.063	0.3

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP107/B2/0.70	MSorg		

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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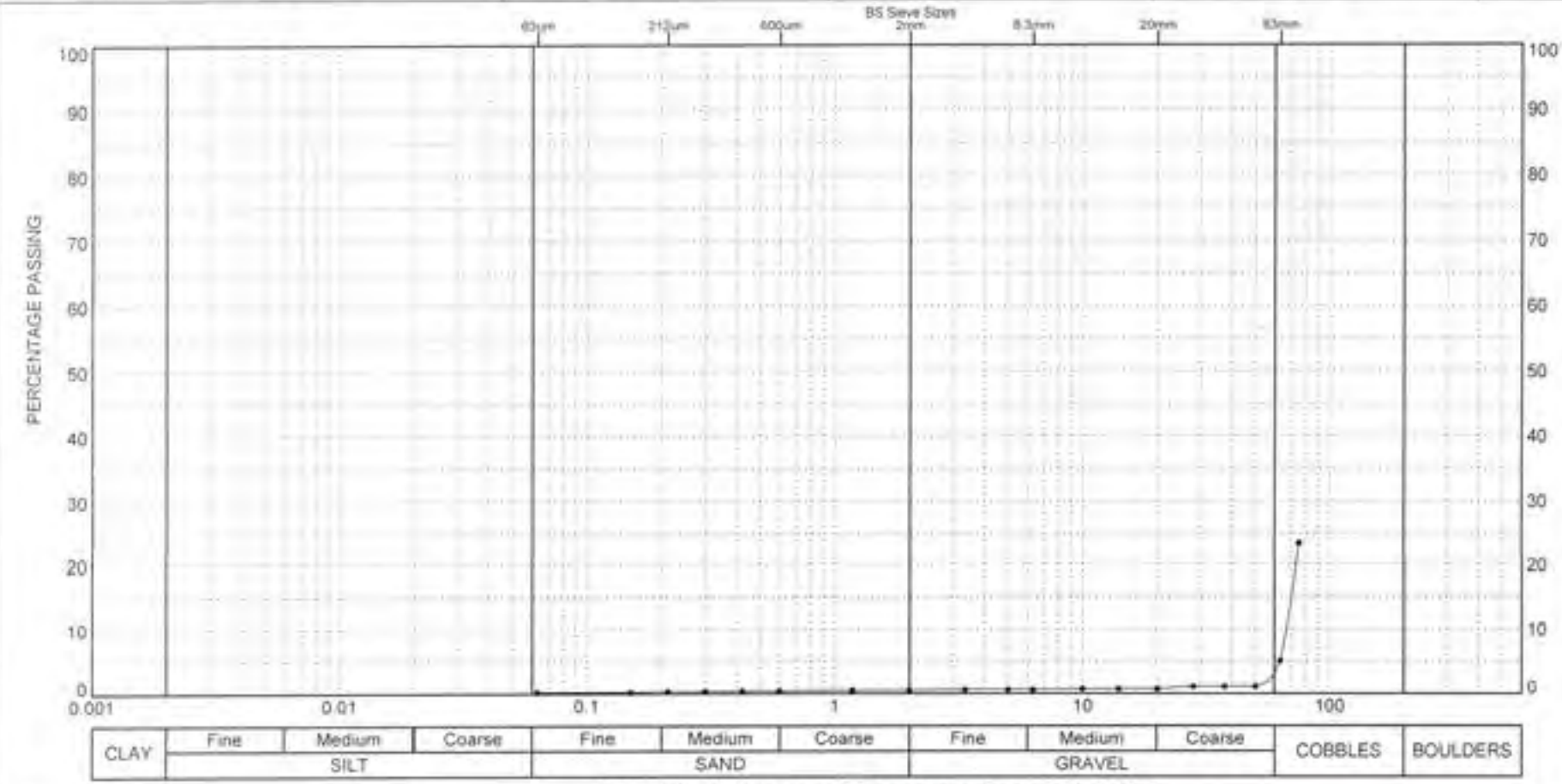
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP109	2.00	LB6	2.00	21/09/2020



Sieve Size (mm)	Passing (%)
75	23.6
63	5.1
50	1.1
37.5	1.1
28	1.1
20	0.7
14	0.7
10	0.7
6.3	0.6
5	0.6
3.35	0.6
2	0.5
1.18	0.5
0.6	0.4
0.425	0.4
0.3	0.3
0.212	0.3
0.15	0.2
0.063	0.2

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP109/LB6/2.00			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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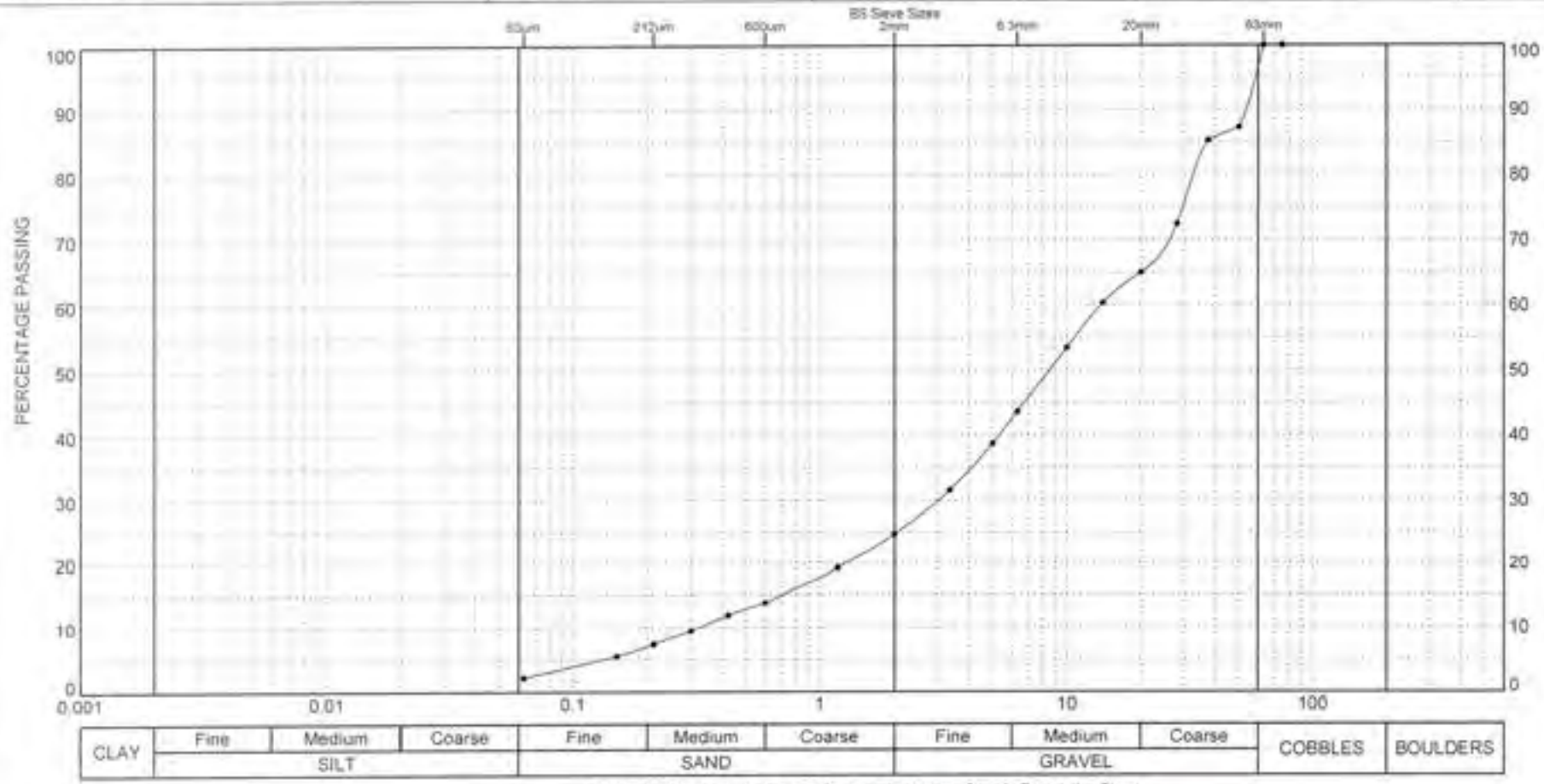
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP110	0.80	B2	0.80	18/09/2020



Sieve Size (mm)	Passing (%)
75	100.0
63	100.0
50	87.3
37.5	85.3
28	72.5
20	65.1
14	60.4
10	53.5
6.3	43.7
5	38.8
3.35	31.6
2	24.8
1.18	19.3
0.6	13.9
0.425	11.8
0.3	9.5
0.212	7.4
0.15	5.6
0.063	2.3

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP110/B2/0.80			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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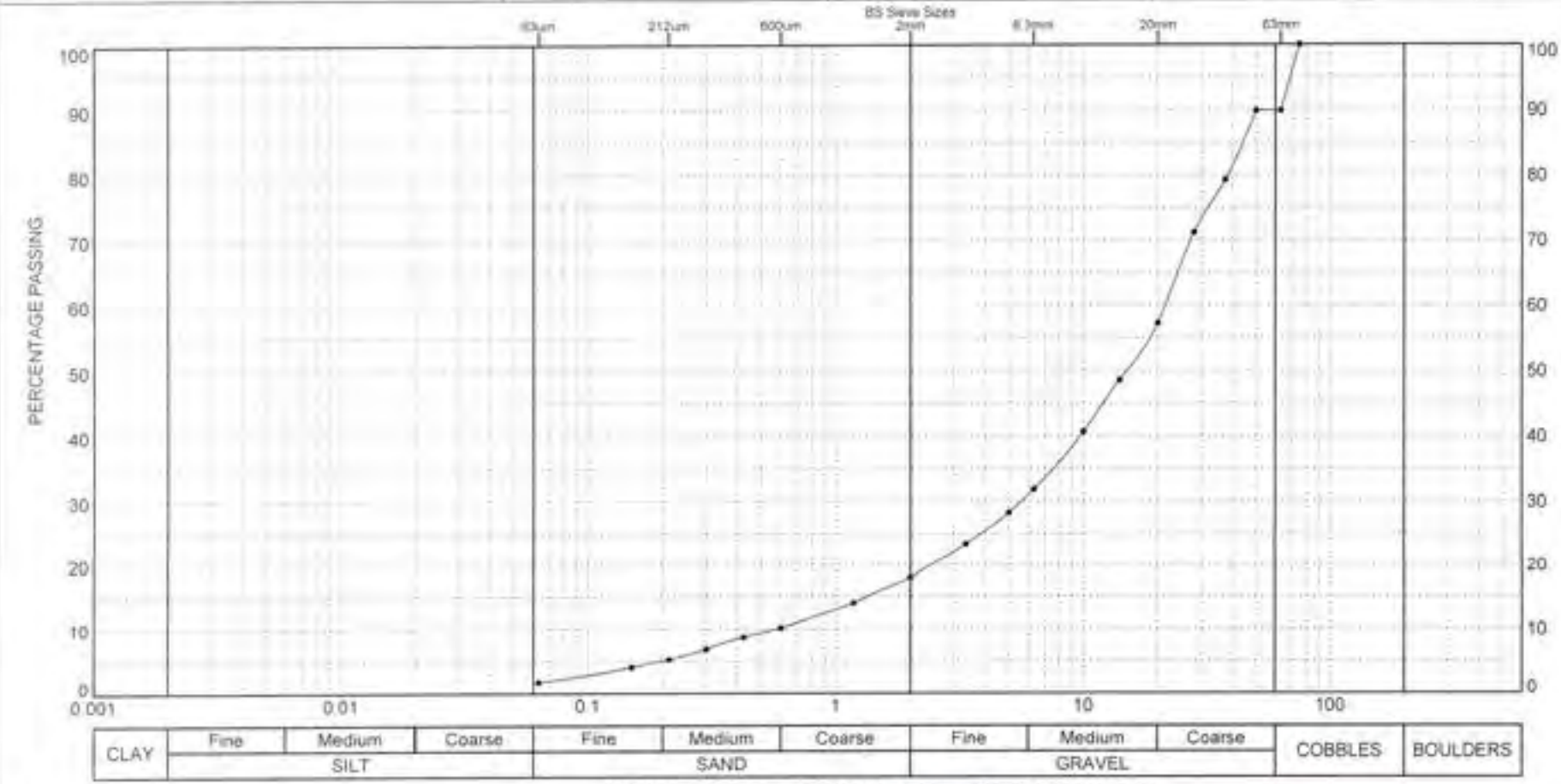
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP110	2.90	B8	2.90	22/09/2020



Sieve Size (mm)	Passing (%)
75	100.0
63	89.9
50	89.9
37.5	79.3
28	71.2
20	57.3
14	48.6
10	40.7
6.3	31.9
5	28.3
3.35	23.5
2	18.1
1.18	14.1
0.6	10.2
0.425	8.7
0.3	6.9
0.212	5.3
0.15	4.0
0.063	1.8

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP110/B8/2.90			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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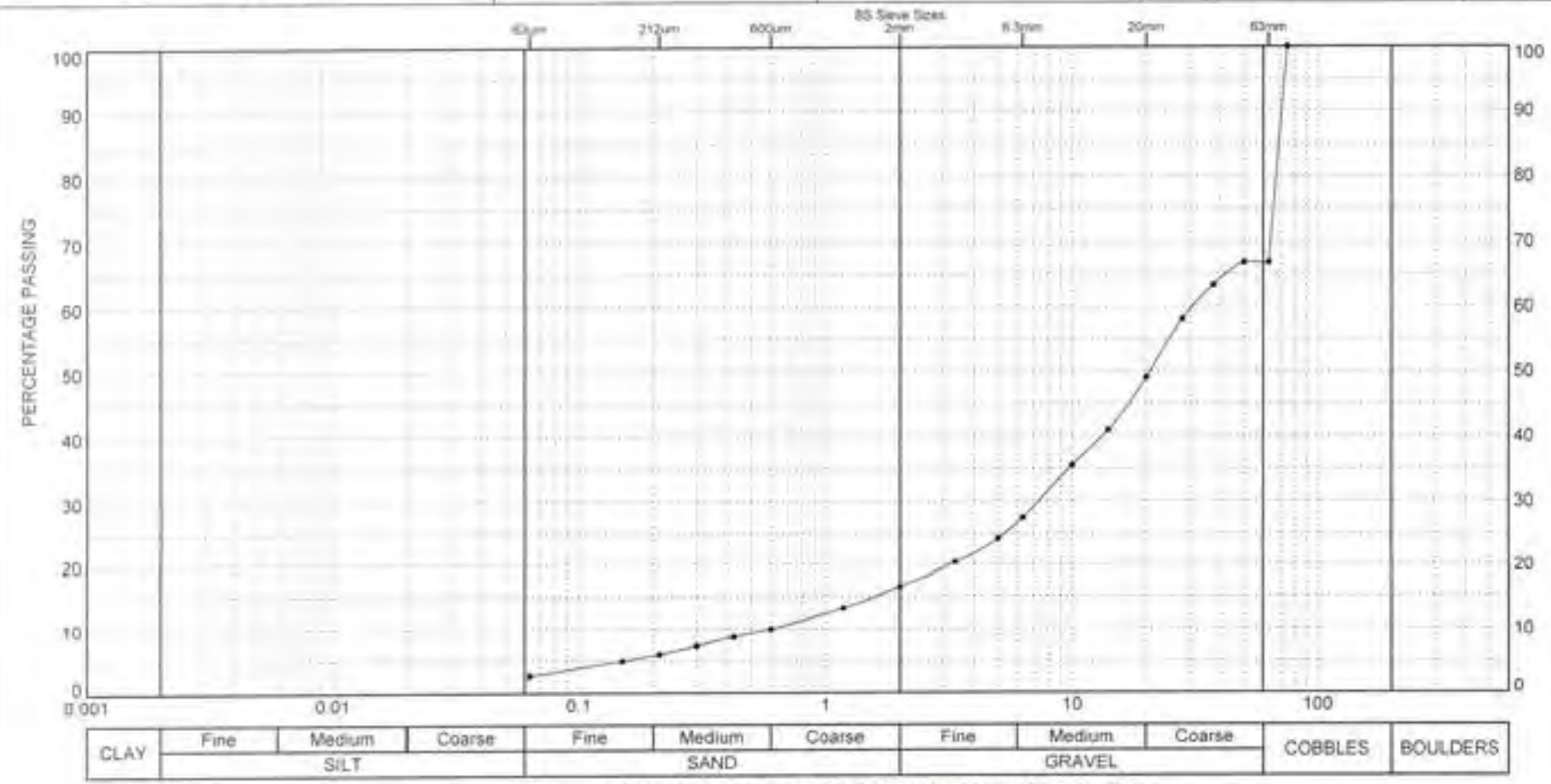
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP112	0.70	B2	0.70	21/09/2020



Sieve Size (mm)	Passing (%)
75	100.0
63	66.8
50	66.8
37.5	63.3
28	58.1
20	49.1
14	41.0
10	35.6
6.3	27.5
5	24.3
3.35	20.4
2	16.4
1.18	13.2
0.6	10.0
0.425	8.8
0.3	7.4
0.212	6.1
0.15	5.0
0.063	2.8

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP112/B2/0.70			

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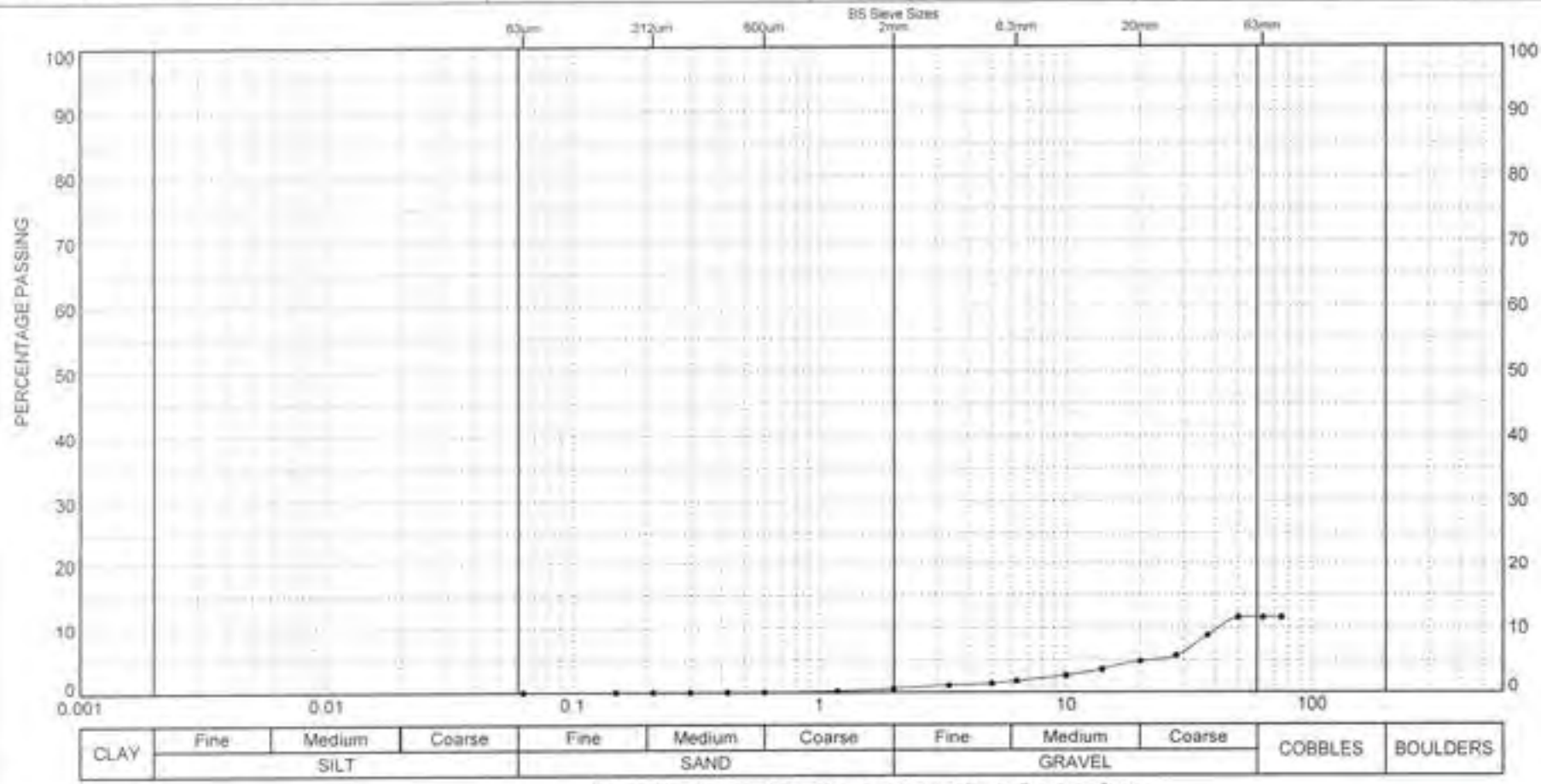
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP112	2.10	LB6	2.10	17/09/2020



Sieve Size (mm)	Passing (%)
75	11.5
63	11.5
50	11.5
37.5	8.8
28	5.7
20	4.8
14	3.5
10	2.6
6.3	1.8
5	1.4
3.35	1.1
2	0.6
1.18	0.2
0.6	0.0
0.425	0.0
0.3	0.0
0.212	0.0
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP112/LB6/2.10		SELKIRK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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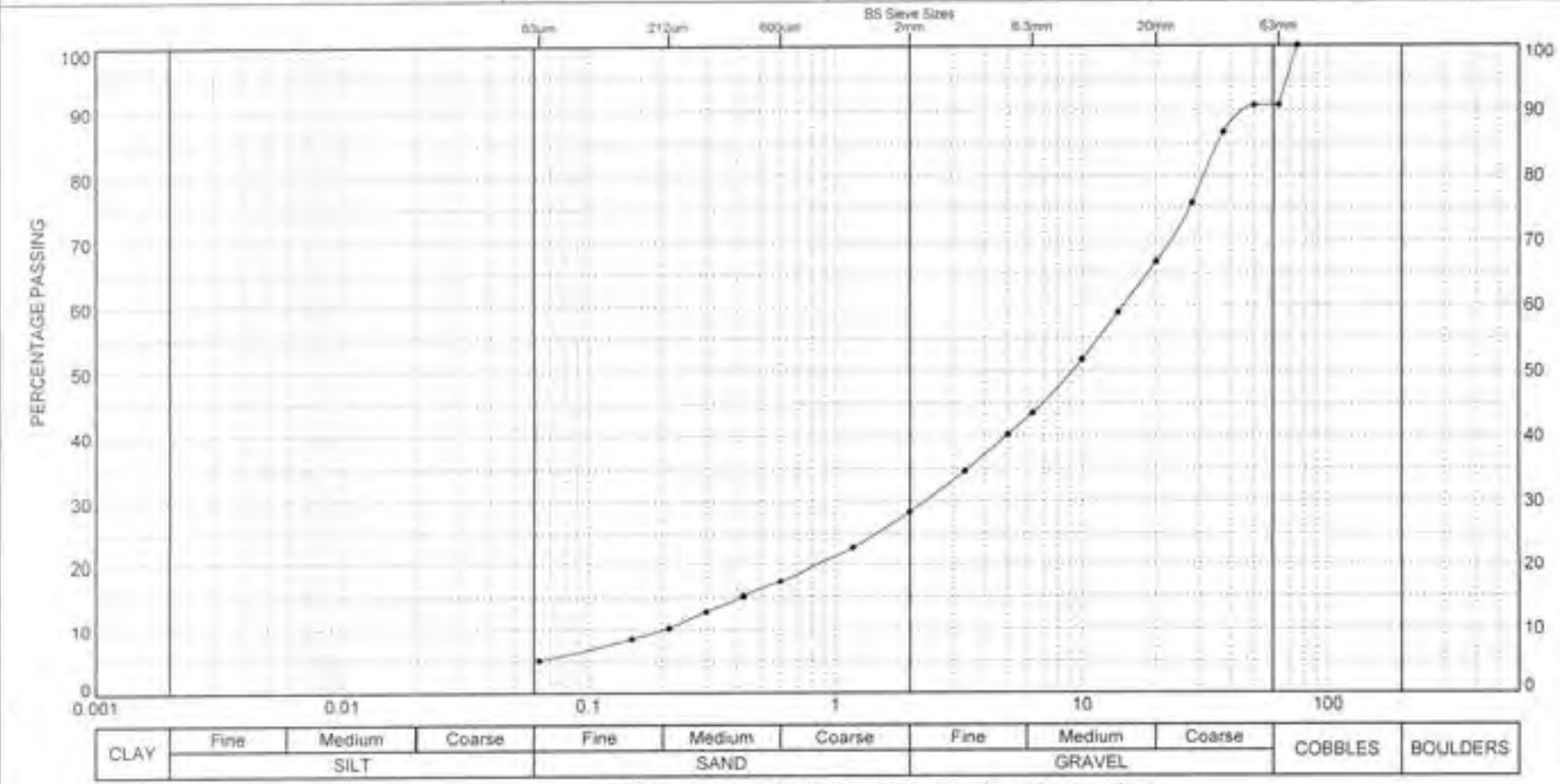
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP113	2.30	LB6	2.30	22/09/2020



Sieve Size (mm)	Passing (%)
75	100.0
63	90.8
50	90.8
37.5	86.7
28	75.9
20	66.8
14	59.0
10	51.8
6.3	43.6
5	40.3
3.35	34.7
2	28.4
1.18	22.9
0.6	17.4
0.425	15.1
0.3	12.6
0.212	10.2
0.15	8.4
0.063	5.1

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP113/LB6/2.30			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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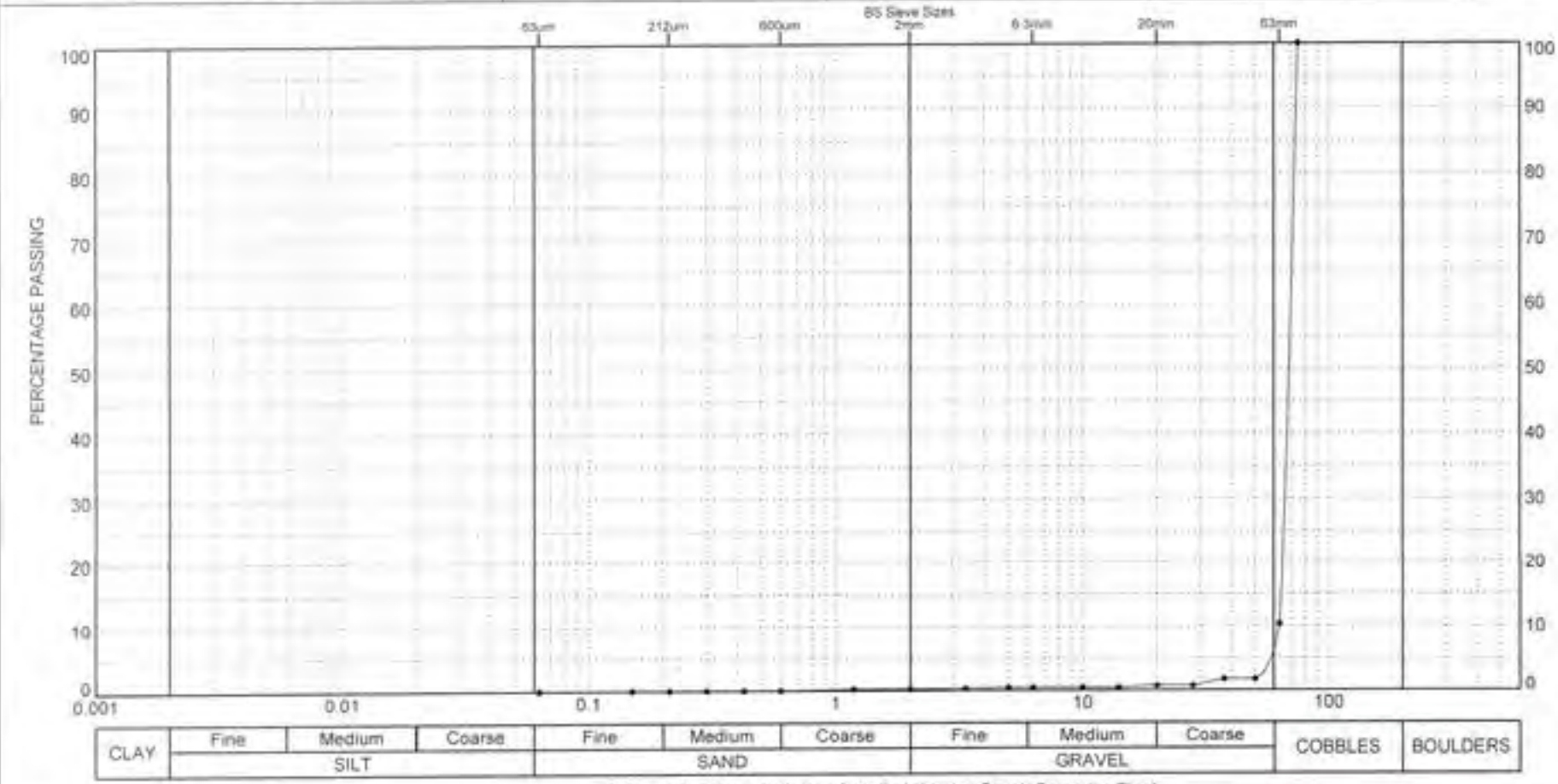
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- **MPA_AUK_TP113**	Depth (m) :- **3.80**	Sample Type & No :- **B10**	Specific Depth (m) :- **3.80**	Date Tested :- **17/09/2020**



Sieve Size (mm)	Passing (%)
75	100.0
63	10.4
50	1.8
37.5	1.8
28	0.7
20	0.7
14	0.4
10	0.4
6.3	0.4
5	0.4
3.35	0.3
2	0.2
1.18	0.2
0.6	0.0
0.425	0.0
0.3	0.0
0.212	0.0
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP113/B10/3.80			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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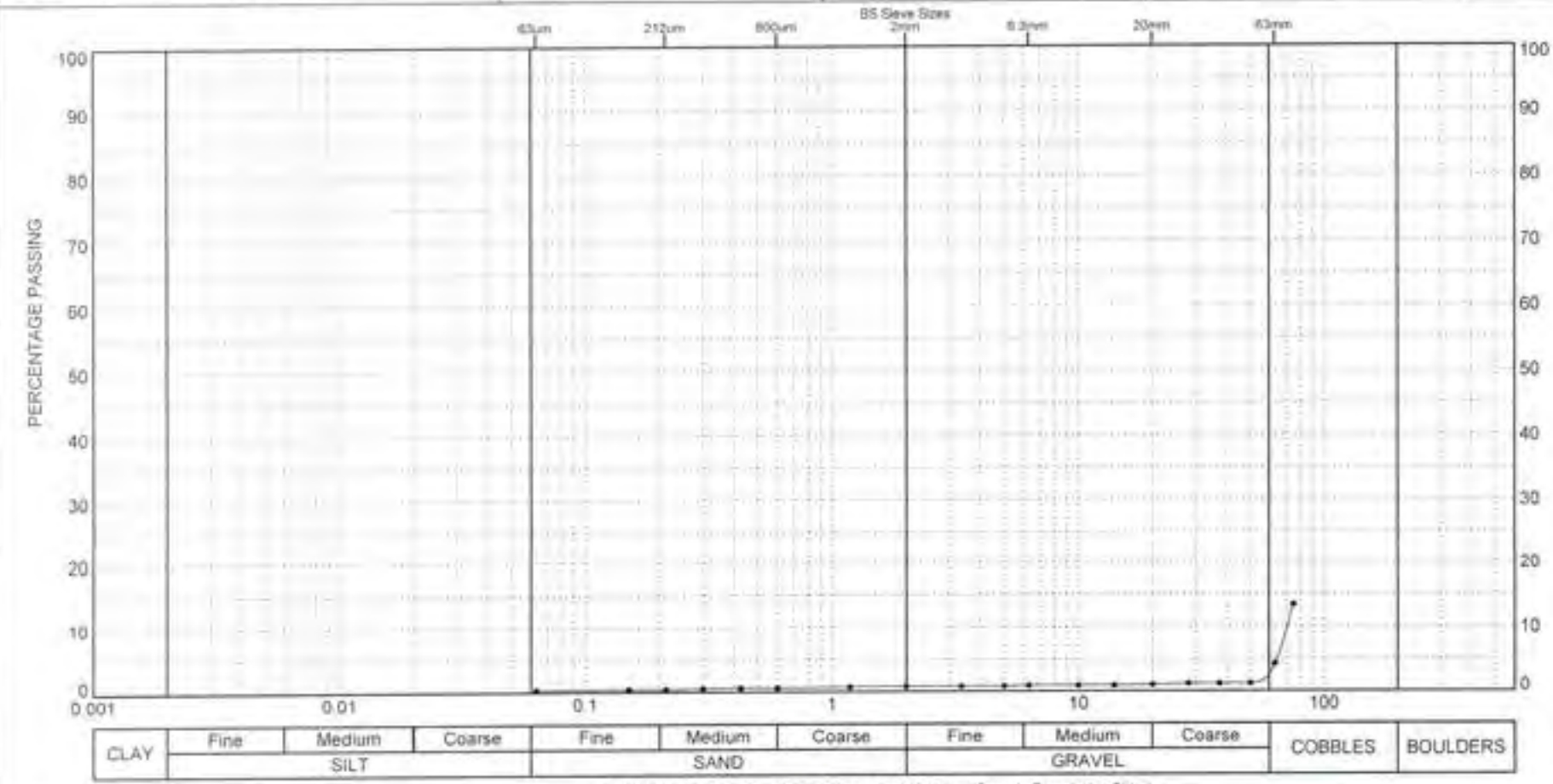
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP114	2.50	LB6	2.50	21/09/2020



Sieve Size (mm)	Passing (%)
75	13.5
63	4.2
50	1.2
37.5	1.2
28	1.2
20	1.0
14	0.9
10	0.9
6.3	0.9
5	0.8
3.35	0.8
2	0.8
1.18	0.7
0.6	0.6
0.425	0.6
0.3	0.5
0.212	0.4
0.15	0.4
0.063	0.3

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP114/LB6/2.50			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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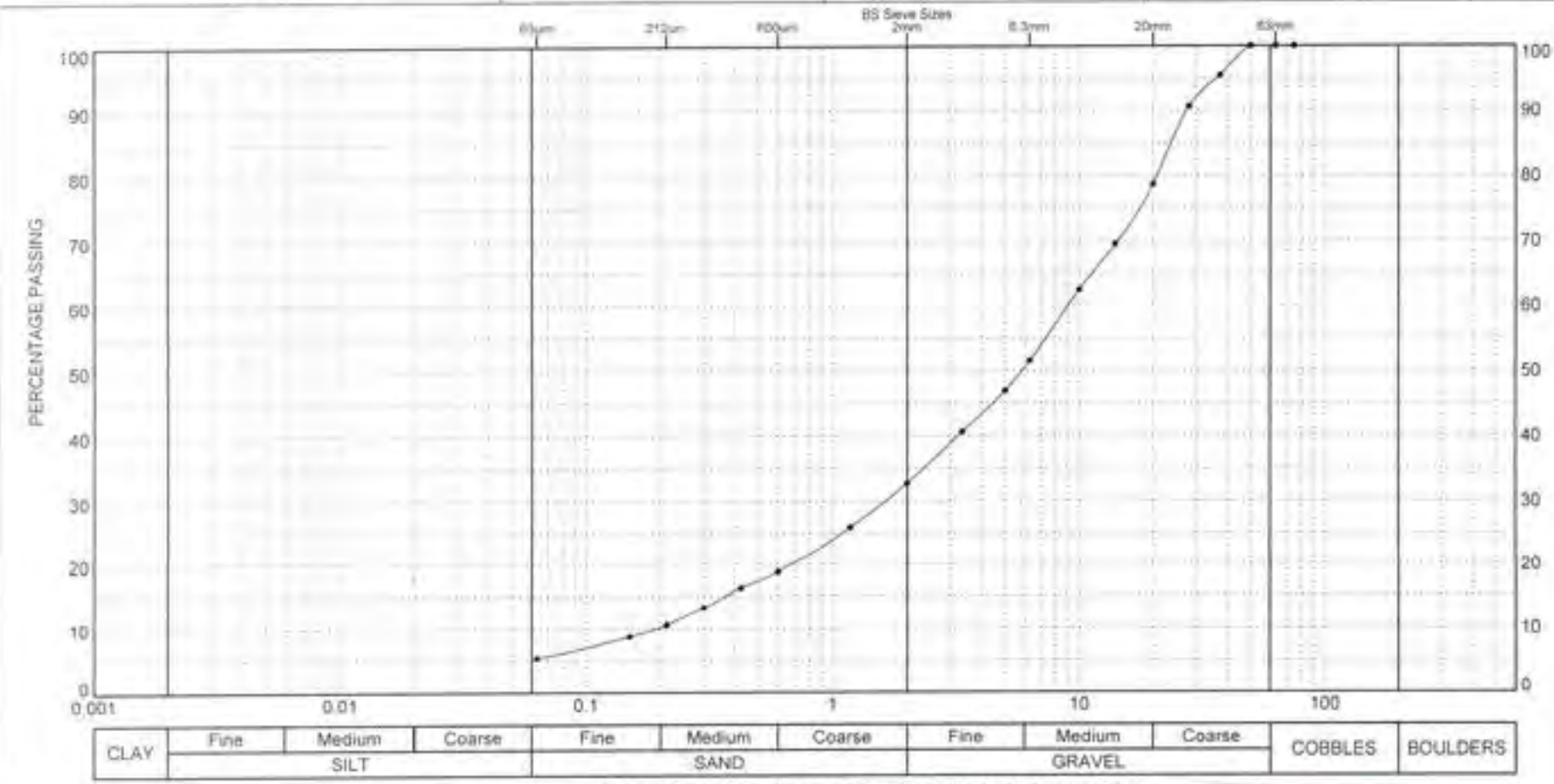
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- **MPA_AUK_TP115**	Depth (m) :- **0.50**	Sample Type & No :- **B2**	Specific Depth (m) :- **0.50**	Date Tested :- **18/09/2020**



Sieve Size (mm)	Passing (%)
75	100.0
63	100.0
50	100.0
37.5	95.5
28	90.7
20	78.8
14	69.5
10	62.5
6.3	51.6
5	47.0
3.35	40.7
2	32.8
1.18	26.0
0.6	18.9
0.425	16.2
0.3	13.2
0.212	10.6
0.15	8.7
0.063	5.4

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP115/B2/0.50	MSone		

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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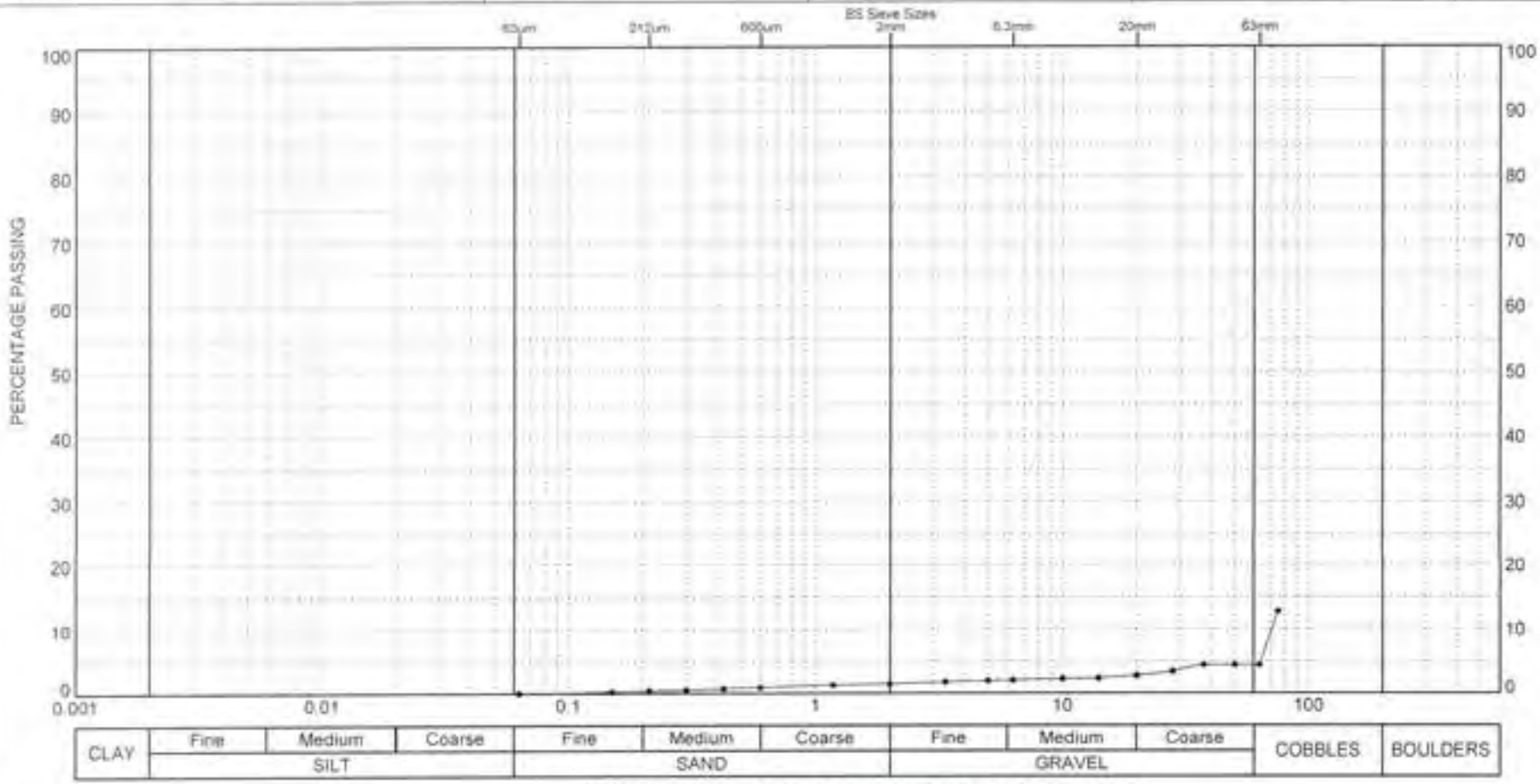
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP115	**2.00**	**LB6**	**2.00**	**18/09/2020**



Sieve Size (mm)	Passing (%)
75	12.8
63	4.4
50	4.4
37.5	4.4
28	3.4
20	2.8
14	2.4
10	2.3
6.3	2.1
5	2.0
3.35	1.8
2	1.5
1.18	1.3
0.6	0.9
0.425	0.7
0.3	0.5
0.212	0.4
0.15	0.2
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
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Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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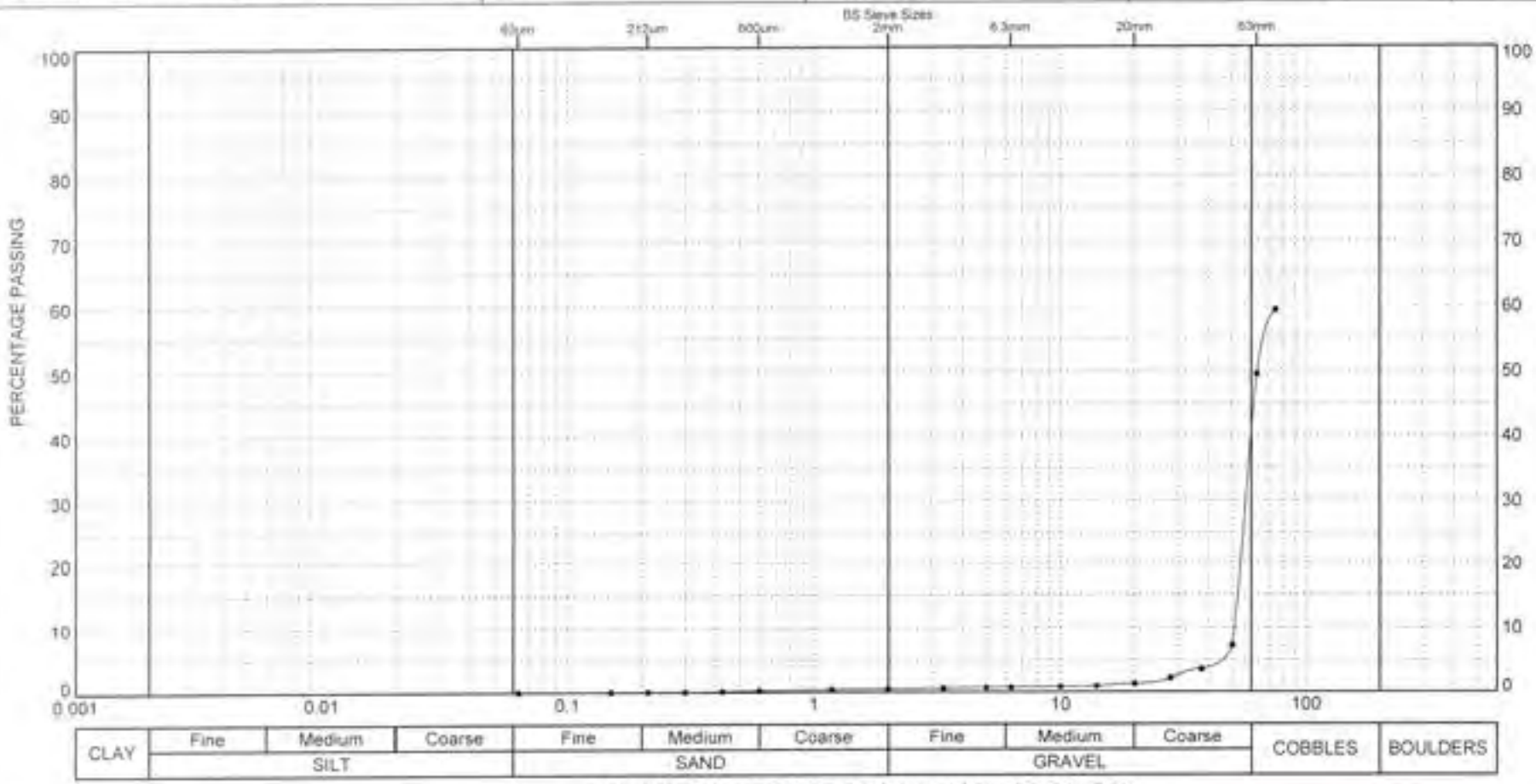
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP116	1.60	B5	1.60	18/09/2020



Sieve Size (mm)	Passing (%)
75	59.4
63	49.5
50	7.2
37.5	3.5
28	2.2
20	1.3
14	0.9
10	0.8
6.3	0.7
5	0.7
3.35	0.6
2	0.5
1.18	0.4
0.6	0.2
0.425	0.1
0.3	0.0
0.212	0.0
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP116/B5/1.60	MSone	[illegible]	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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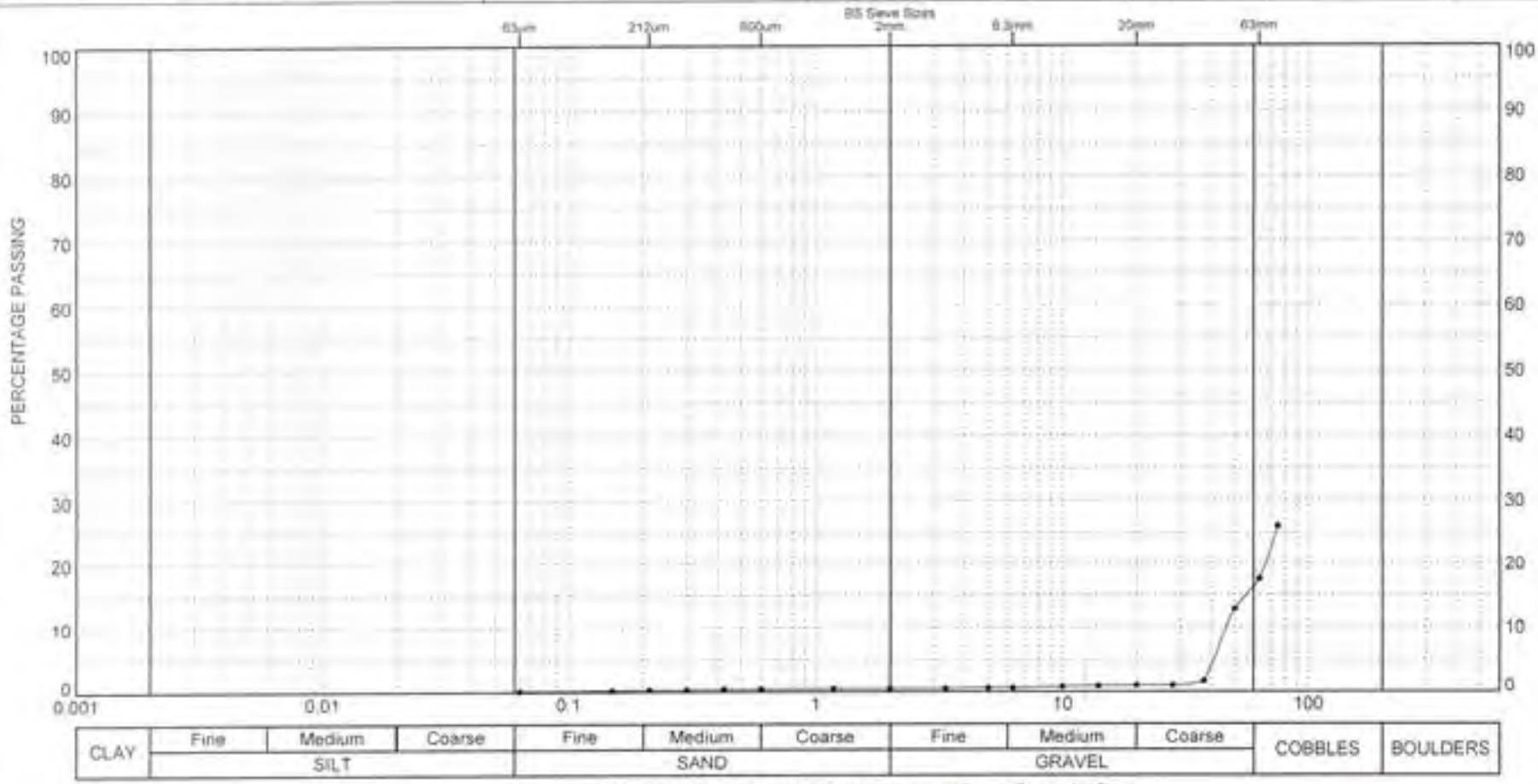
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- **MPA_AUK_TP117**	Depth (m) :- **2.00**	Sample Type & No :- **LB6**	Specific Depth (m) :- **2.00**	Date Tested :- **22/09/2020**



Sieve Size (mm)	Passing (%)
75	26.1
63	17.7
50	12.9
37.5	1.7
28	1.0
20	1.0
14	0.9
10	0.8
6.3	0.6
5	0.6
3.35	0.5
2	0.5
1.18	0.5
0.6	0.4
0.425	0.4
0.3	0.3
0.212	0.3
0.15	0.2
0.063	0.1

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP117/LB6/2.00			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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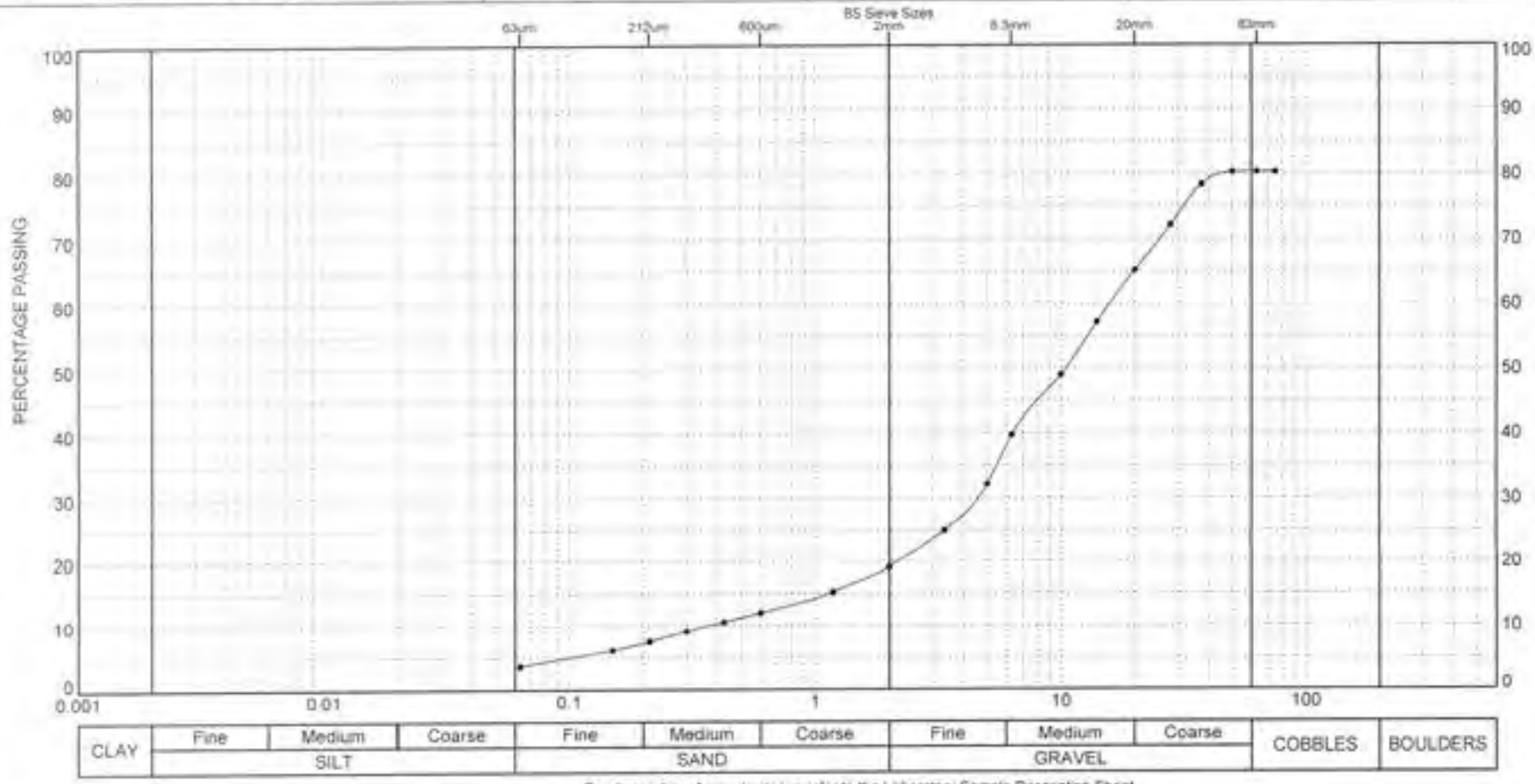
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP118	0.60	B2	0.60	23/09/2020



Sieve Size (mm)	Passing (%)
75	80.3
63	80.3
50	80.3
37.5	78.4
28	72.2
20	65.2
14	57.2
10	49.1
6.3	39.8
5	32.2
3.35	25.1
2	19.2
1.18	15.2
0.6	11.9
0.425	10.6
0.3	9.1
0.212	7.6
0.15	6.3
0.063	3.7

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP118/B2/0.60			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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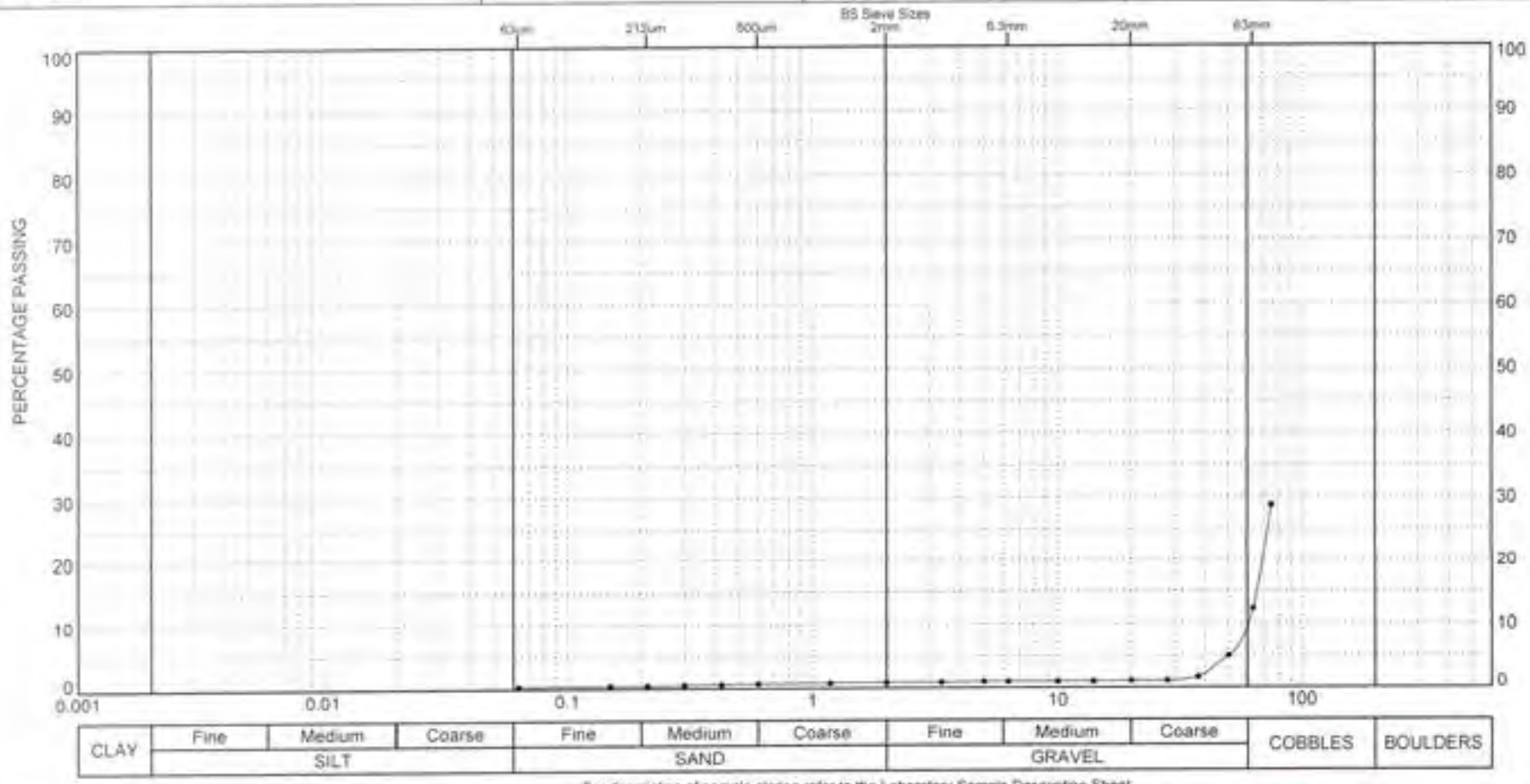
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP118	2.00	LB6	2.00	24/09/2020



Sieve Size (mm)	Passing (%)
75	28.8
63	12.3
50	5.0
37.5	1.7
28	1.1
20	1.1
14	1.0
10	1.0
6.3	1.0
5	1.0
3.35	0.9
2	0.9
1.18	0.8
0.6	0.7
0.425	0.6
0.3	0.5
0.212	0.4
0.15	0.4
0.063	0.3

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP118/LB6/2.00			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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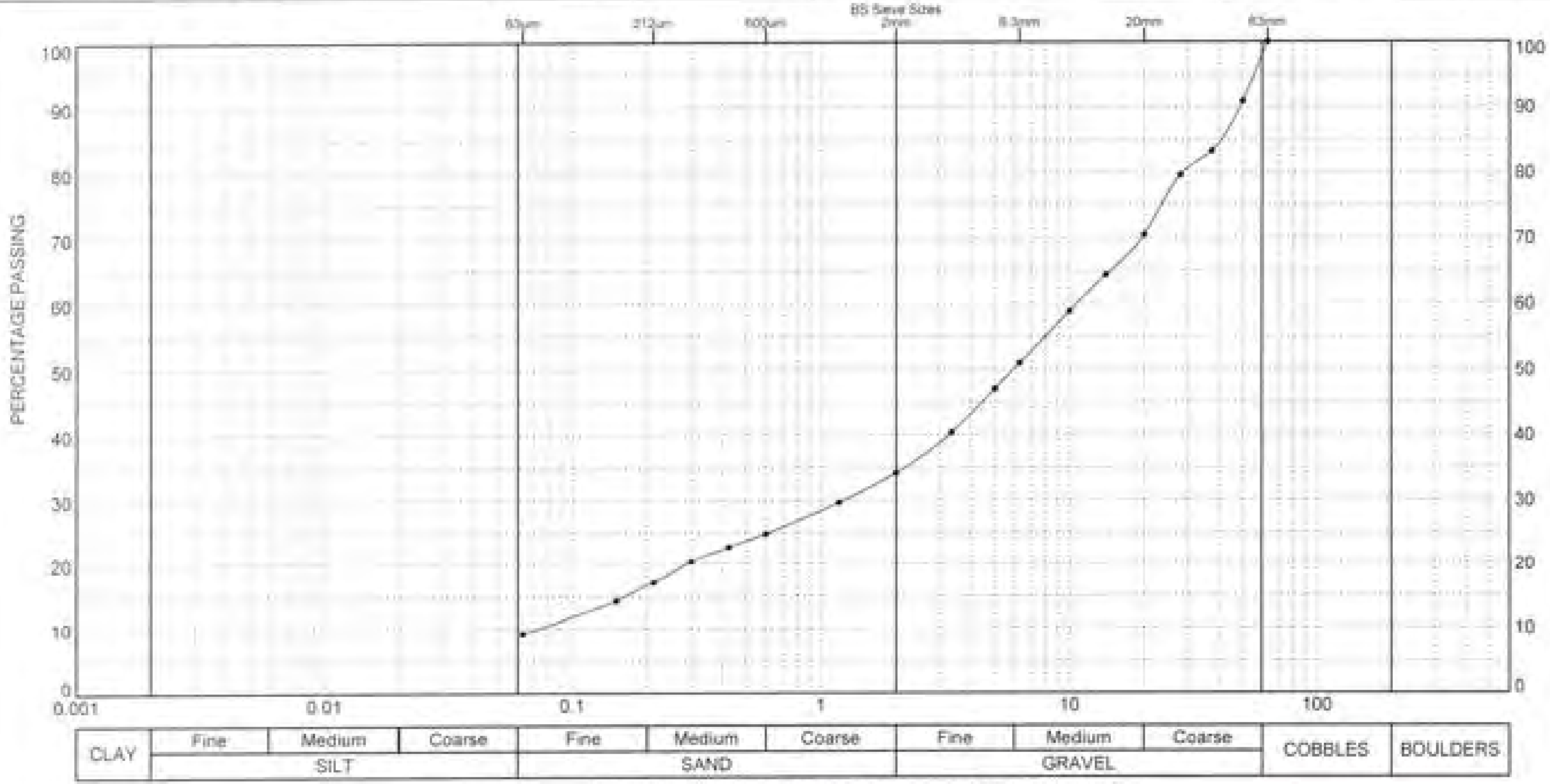
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- MPA_AUK_TP119	Depth (m) :- 0.80	Sample Type & No :- B2	Specific Depth (m) :- 0.80	Date Tested :- 22/09/2020



Sieve Size (mm)	Passing (%)
63	100.0
50	90.9
37.5	83.3
28	79.7
20	70.5
14	64.4
10	58.9
6.3	51.0
5	47.1
3.35	40.4
2	34.2
1.18	29.7
0.6	24.9
0.425	22.8
0.3	20.3
0.212	17.2
0.15	14.4
0.063	9.2

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 05/11/2020	Certificate No :- PSD/4291/MPA_AUK_TP119/B2/0.80	Signed :-	Name :- M. SELKIRK	Page 1 of 1
Client :- South Tees Development Corporation	Contract Title :- Metal Processing Area Shallow Soils Investigation			AEG Contract No :- 4291

UKAS TESTING 1367

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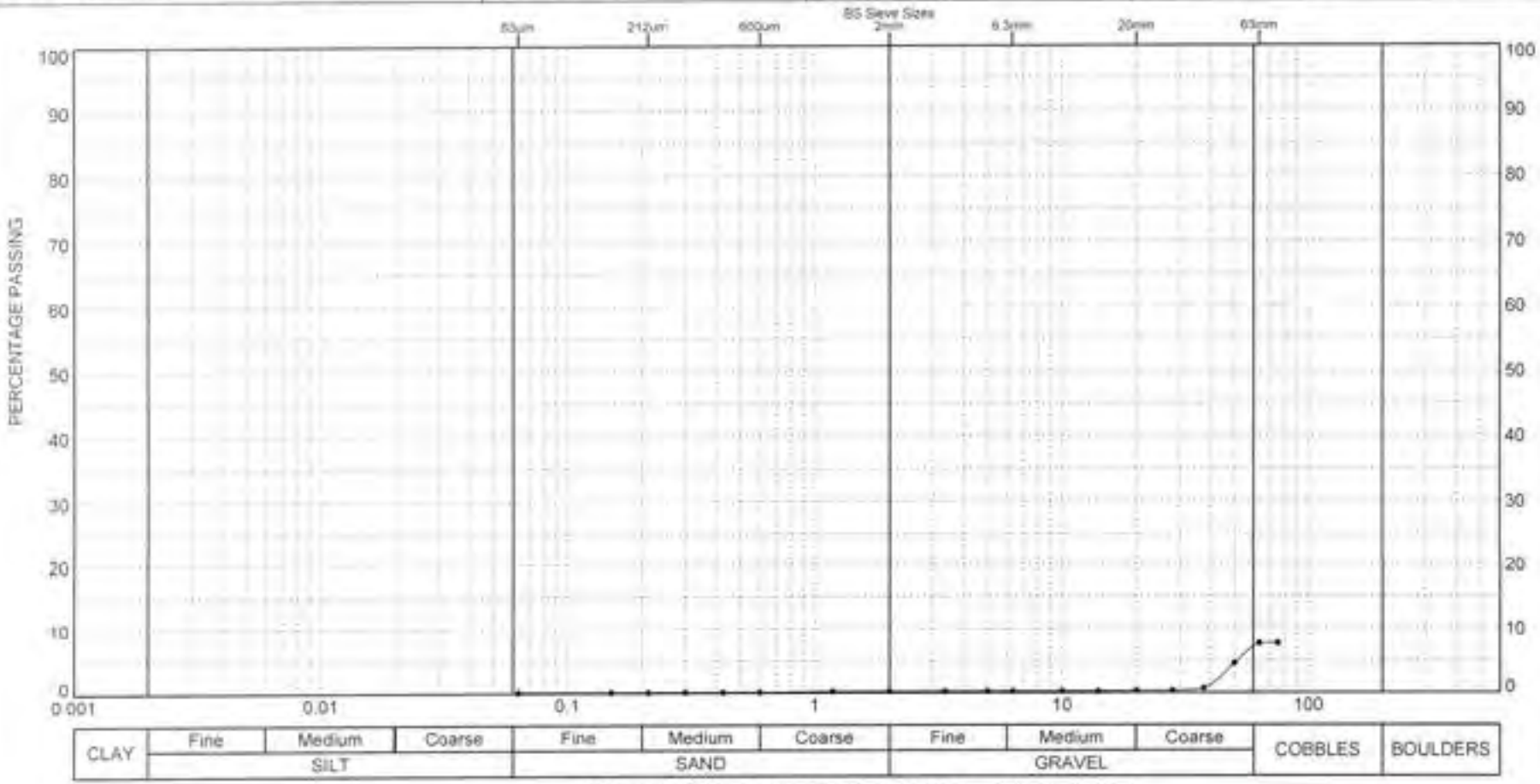
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP119	3.00	LB8	3.00	22/09/2020



Sieve Size (mm)	Passing (%)
75	7.7
63	7.7
50	4.6
37.5	0.7
28	0.3
20	0.3
14	0.2
10	0.2
6.3	0.2
5	0.2
3.35	0.2
2	0.2
1.18	0.2
0.6	0.1
0.425	0.1
0.3	0.1
0.212	0.1
0.15	0.1
0.063	0.1

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP119/LB8/3.00			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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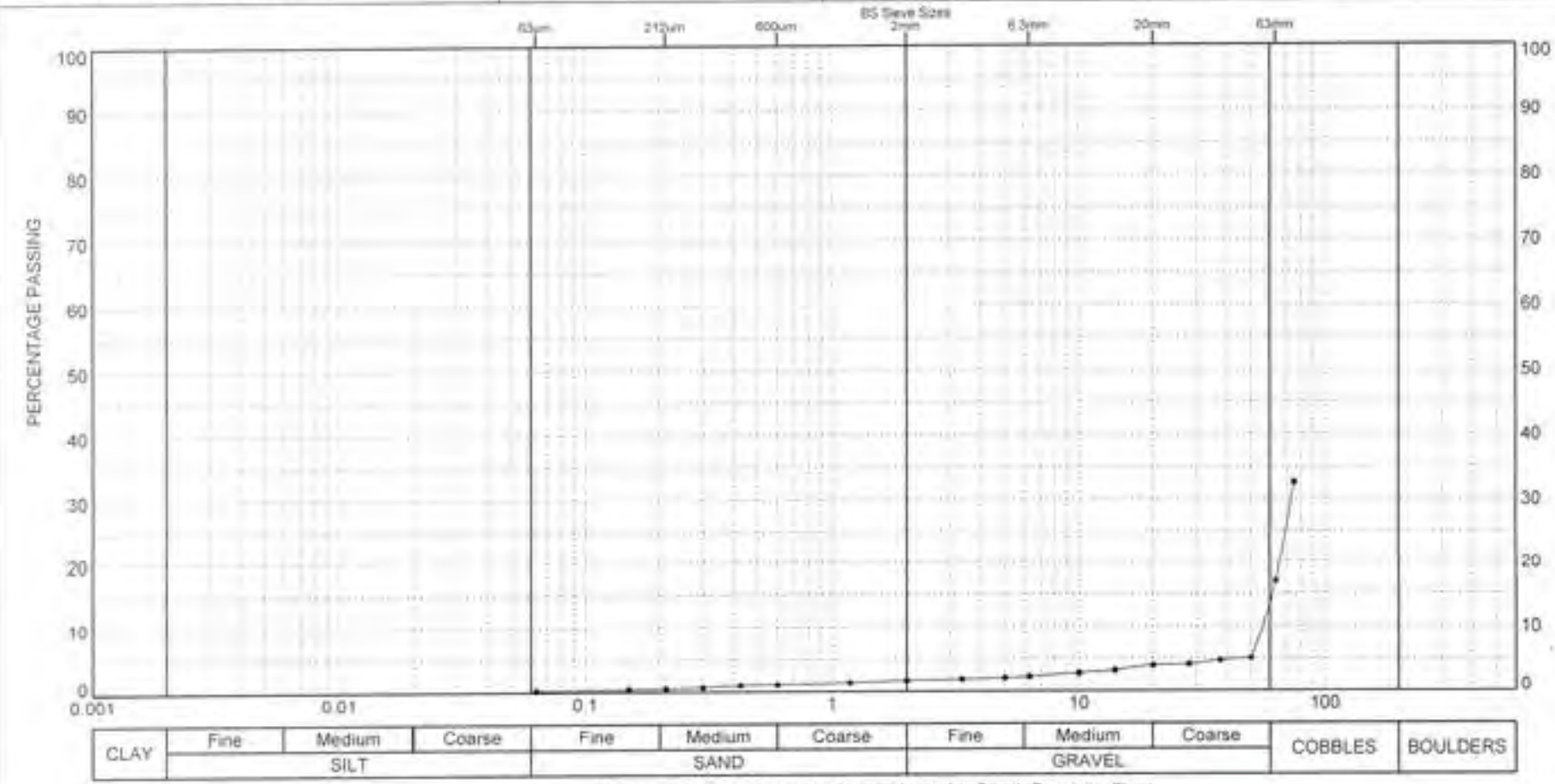
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP120	**0.60**	**B2**	**0.60**	**17/09/2020**



Sieve Size (mm)	Passing (%)
75	32.6
63	17.1
50	5.1
37.5	4.7
28	4.1
20	3.9
14	3.2
10	2.8
6.3	2.3
5	2.1
3.35	1.9
2	1.7
1.18	1.4
0.6	1.1
0.425	1.0
0.3	0.7
0.212	0.5
0.15	0.4
0.063	0.2

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP120/B2/0.60		N. DELPARK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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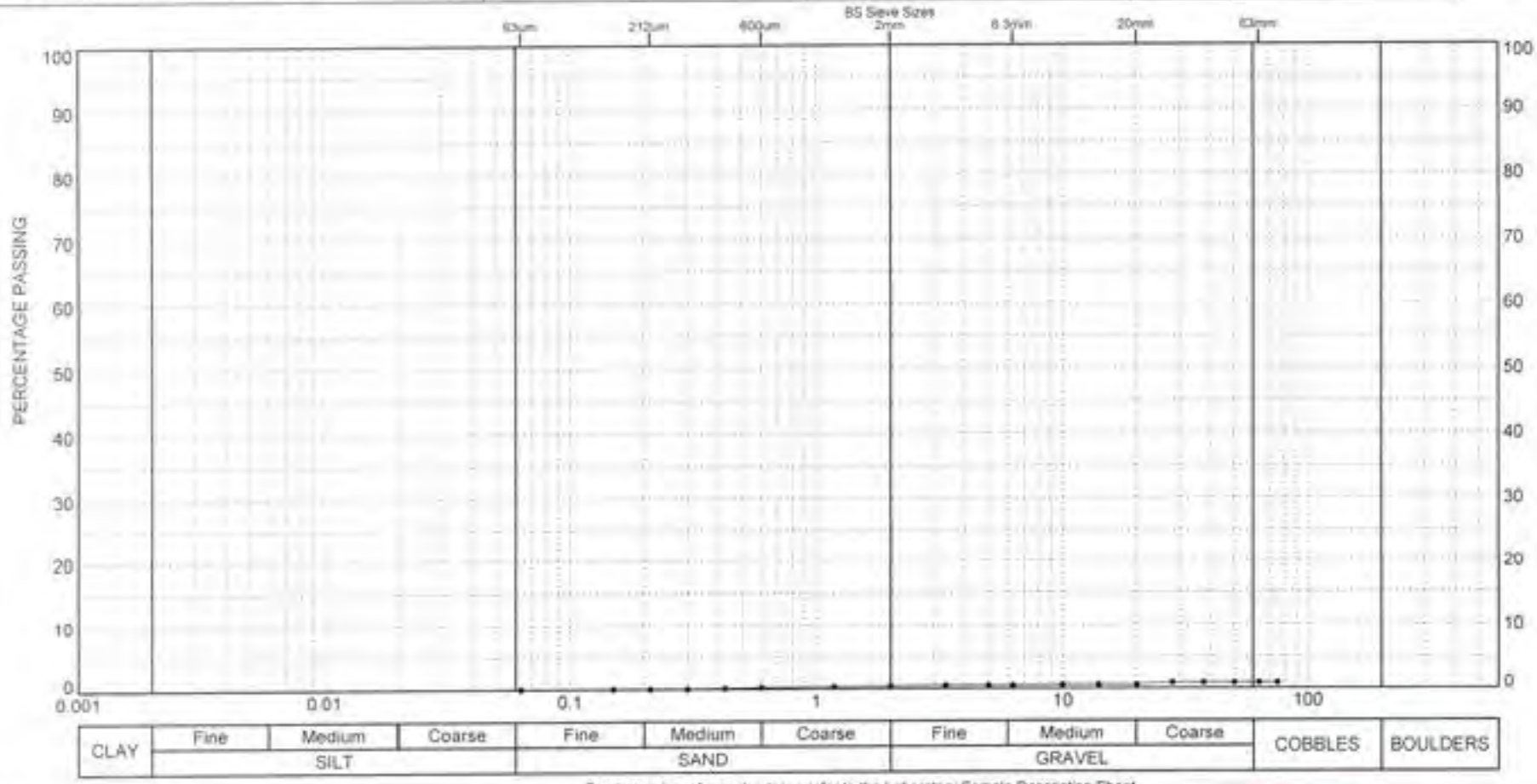
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 ; 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP120	2.00	LB6	2.00	18/09/2020



Sieve Size (mm)	Passing (%)
75	0.9
63	0.9
50	0.9
37.5	0.9
28	0.9
20	0.6
14	0.6
10	0.6
6.3	0.5
5	0.5
3.35	0.5
2	0.4
1.18	0.3
0.6	0.2
0.425	0.1
0.3	0.0
0.212	0.0
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP120/LB6/2.00	MSerl	M SERKPK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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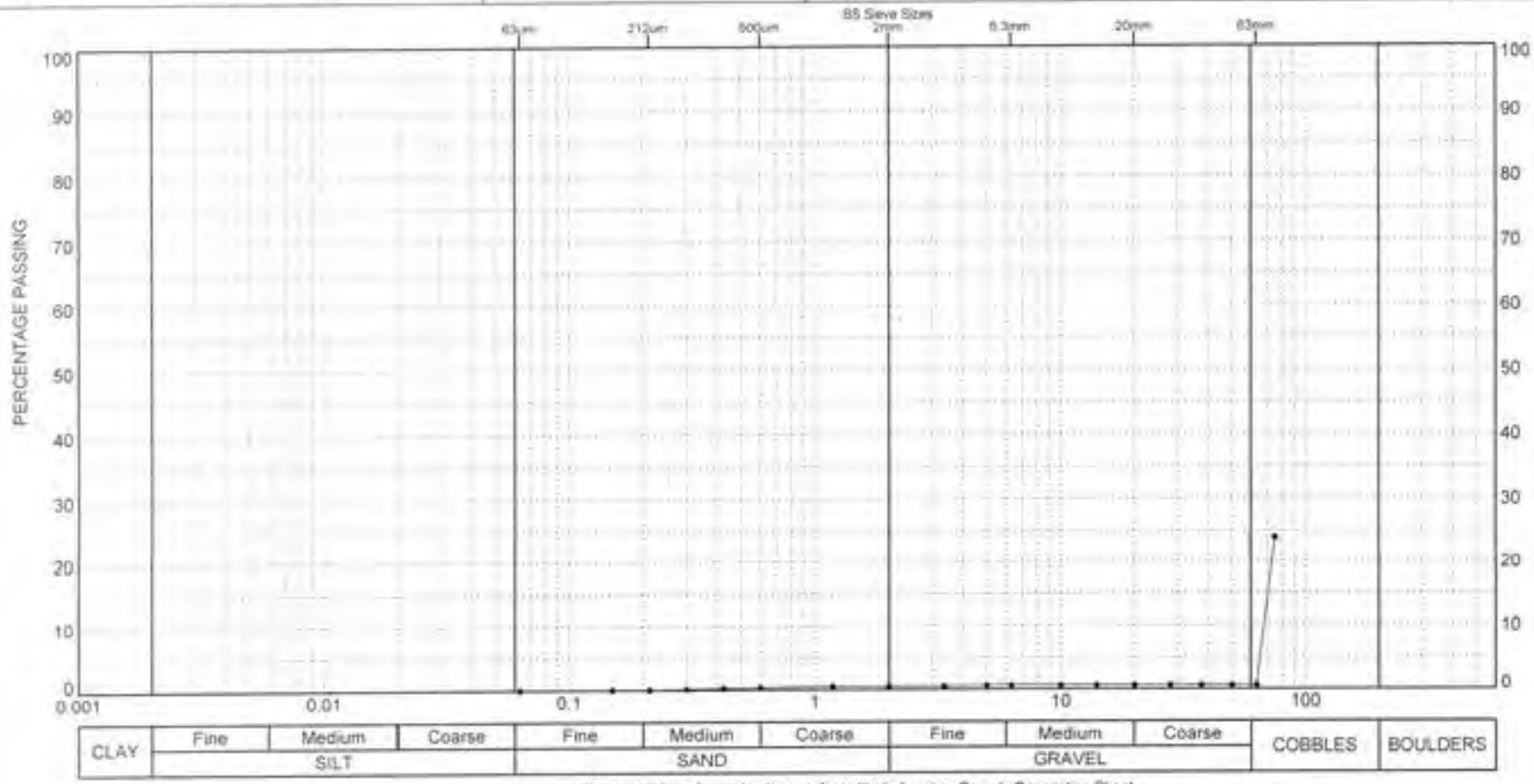
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP120	3.80	B10	3.80	17/09/2020



Sieve Size (mm)	Passing (%)
75	24.0
63	0.6
50	0.6
37.5	0.6
28	0.6
20	0.6
14	0.6
10	0.6
6.3	0.6
5	0.6
3.35	0.5
2	0.5
1.18	0.5
0.6	0.3
0.425	0.2
0.3	0.1
0.212	0.0
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP120/B10/3.80	mseq	M SELKIRK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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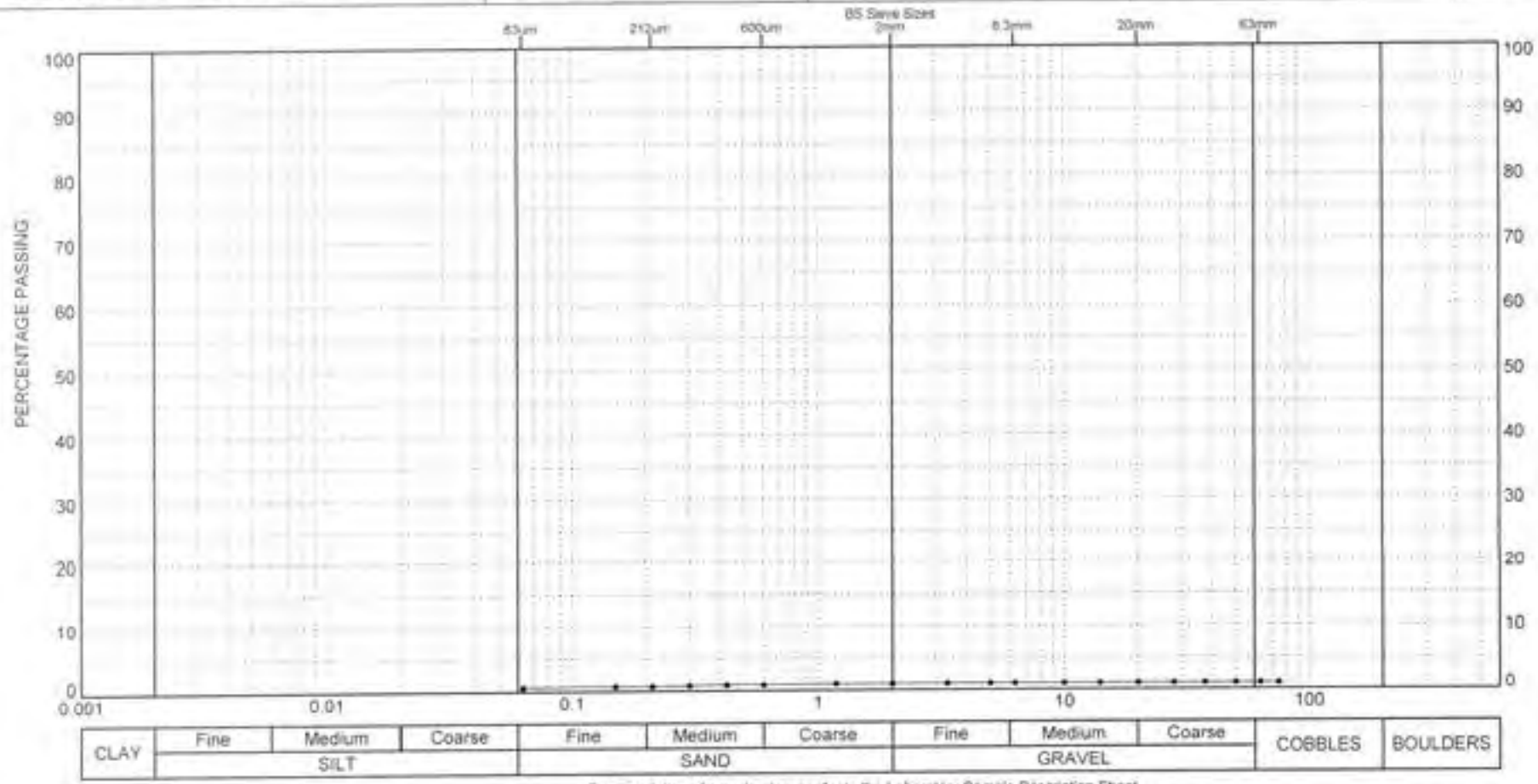
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP121	2.50	LB6	2.50	21/09/2020



Sieve Size (mm)	Passing (%)
75	1.0
63	1.0
50	1.0
37.5	1.0
28	1.0
20	1.0
14	1.0
10	1.0
6.3	1.0
5	1.0
3.35	1.0
2	1.0
1.18	1.0
0.6	0.9
0.425	0.9
0.3	0.8
0.212	0.7
0.15	0.7
0.063	0.6

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP121/LB6/2.50			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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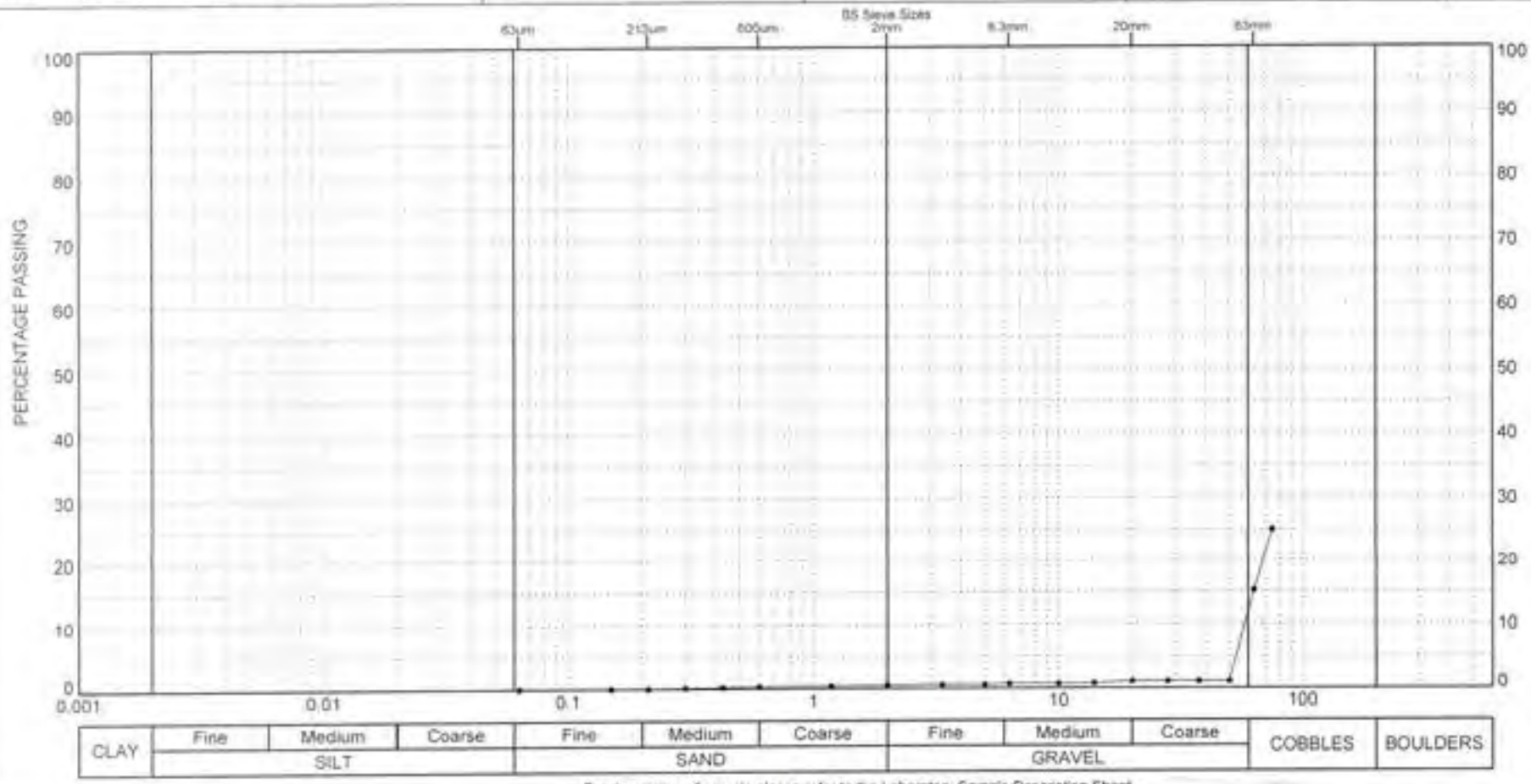
Head Office: Unit 2F, Wylla Gill Industrial Estate, Fenton Park, Chester-le-Street, Co. Durham, DH2 2HG. - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit D1, Business Development Centre, Earlam Wharf, Blackburn, BB1 5BL. - Tel: 01772 735 306 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP122	**1.70**	**B5**	**1.70**	**17/09/2020**



Sieve Size (mm)	Passing (%)
75	25.1
63	15.2
50	1.1
37.5	1.1
28	1.1
20	1.1
14	0.8
10	0.7
6.3	0.7
5	0.6
3.35	0.6
2	0.5
1.18	0.4
0.6	0.3
0.425	0.2
0.3	0.1
0.212	0.0
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP122/B5/1.70	MSeq		

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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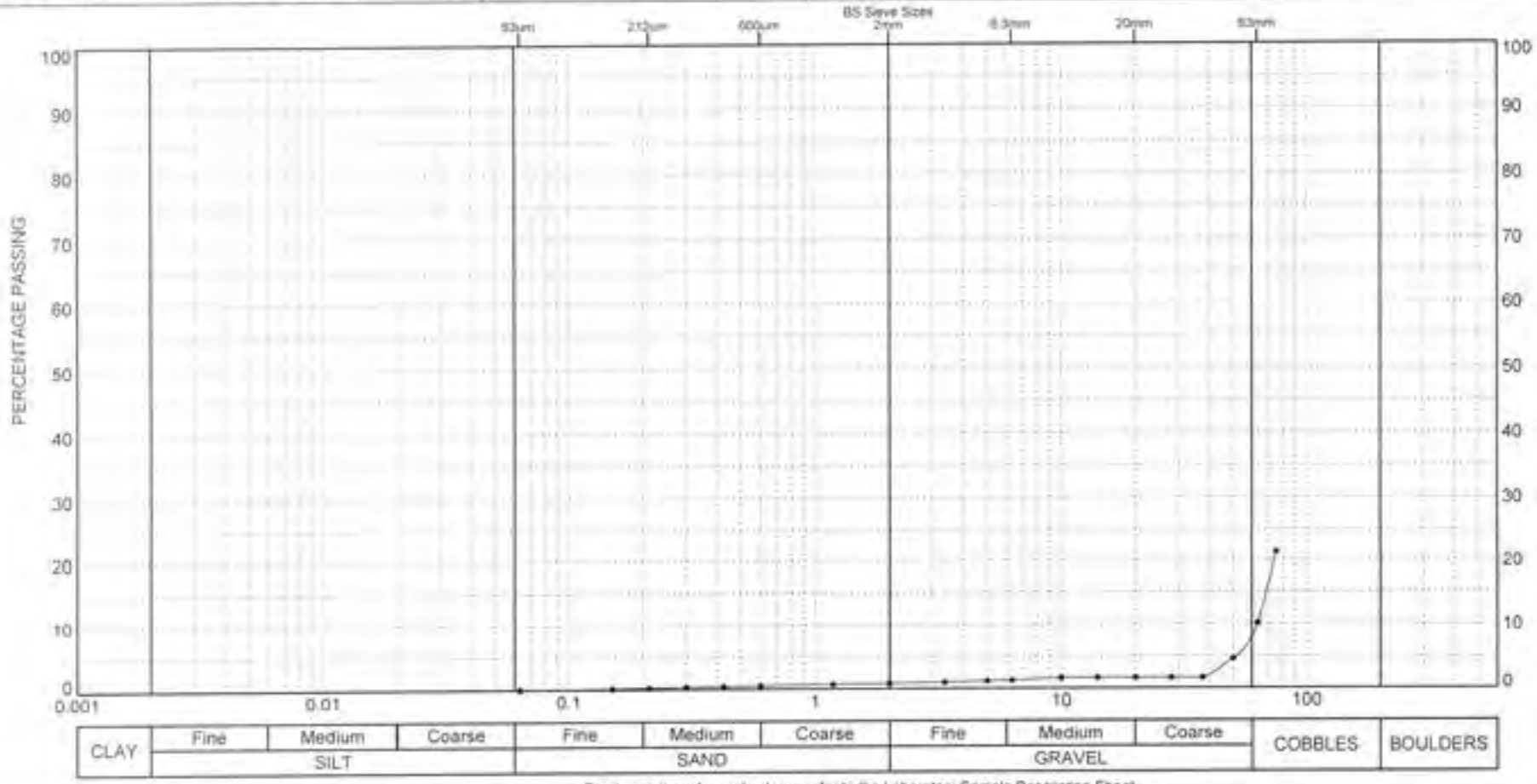
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP122	**2.80**	**LB7**	**2.80**	**24/09/2020**



Sieve Size (mm)	Passing (%)
75	21.5
63	10.2
50	4.6
37.5	1.7
28	1.7
20	1.7
14	1.7
10	1.7
6.3	1.3
5	1.2
3.35	1.0
2	0.8
1.18	0.7
0.6	0.5
0.425	0.4
0.3	0.3
0.212	0.2
0.15	0.1
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP122/LB7/2.80			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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ALLIED EXPLORATION & GEOTECHNICS LIMITED

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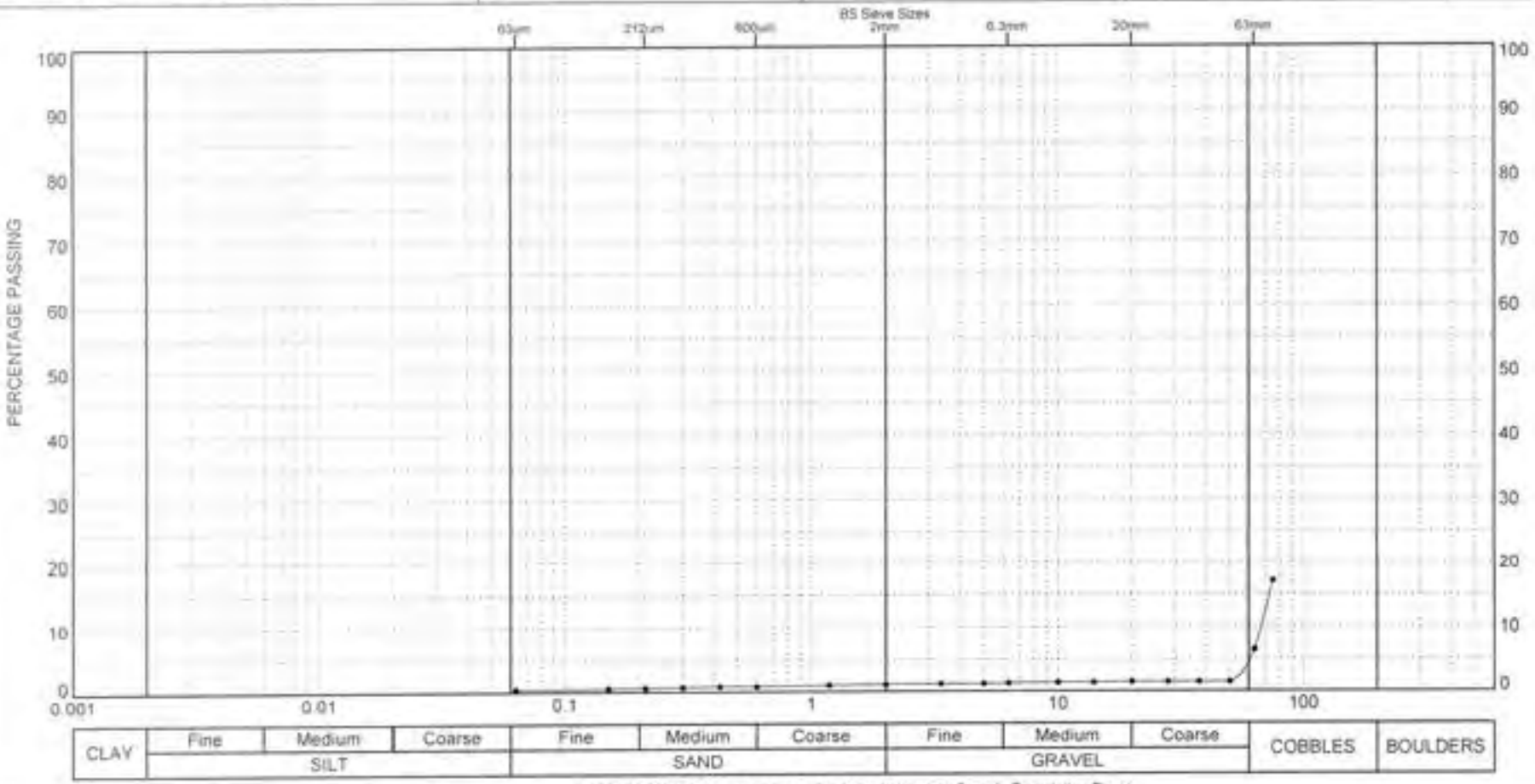
Regional Office: Unit 20, Business Development Centre, Earcam Road, Blackburn, BB1 5QL - Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP123	2.30	LB6	2.30	22/09/2020



Sieve Size (mm)	Passing (%)
75	17.3
63	6.5
50	1.5
37.5	1.5
28	1.5
20	1.5
14	1.4
10	1.4
6.3	1.3
5	1.2
3.35	1.2
2	1.1
1.18	1.0
0.6	0.8
0.425	0.8
0.3	0.7
0.212	0.6
0.15	0.5
0.063	0.4

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP123/LB6/2.30			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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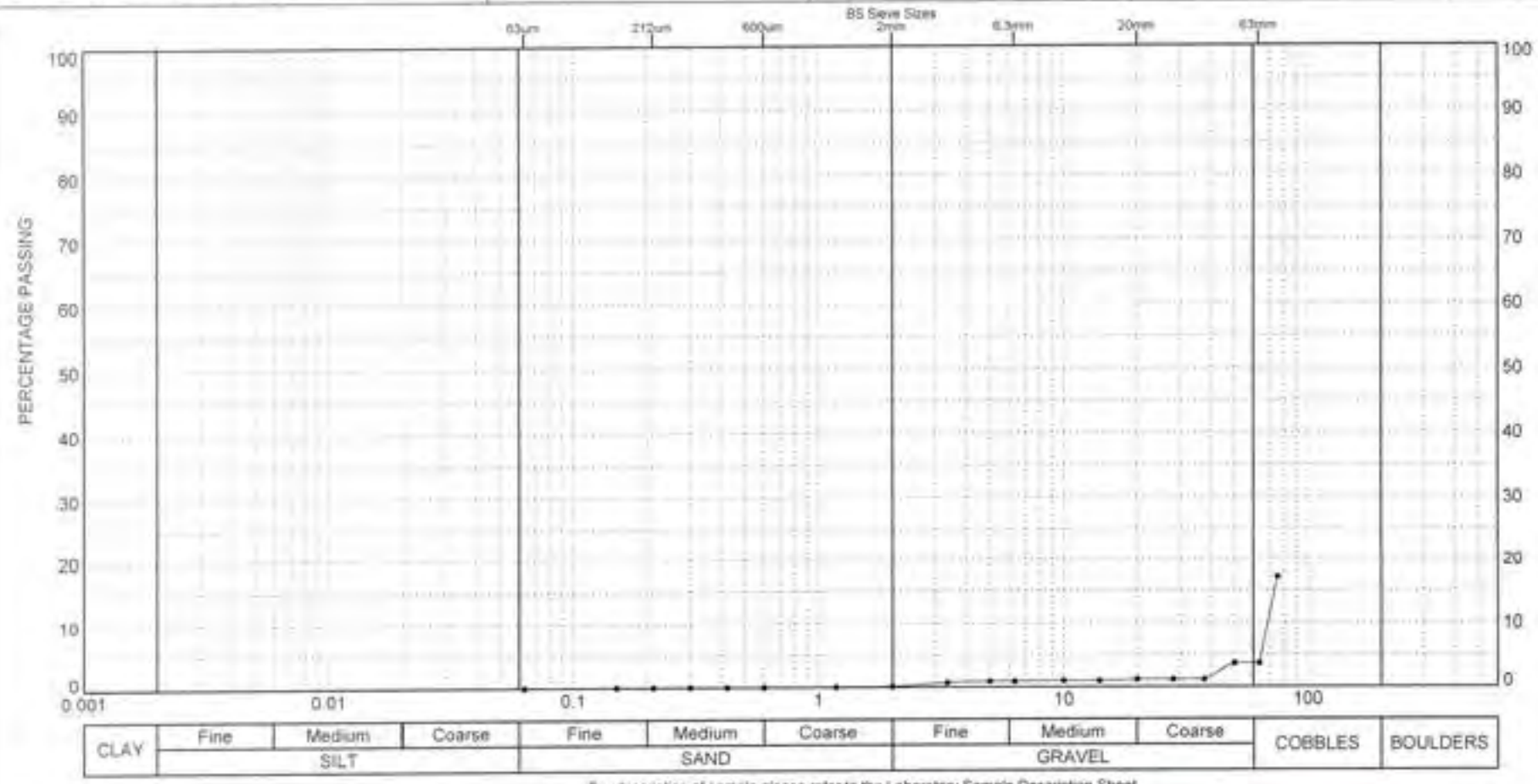
Head Office: Unit 25 Stella Old Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 21, Business Development Centre, Forum Way, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP124	1.60	B5	1.60	24/09/2020



Sieve Size (mm)	Passing (%)
75	17.3
63	3.6
50	3.6
37.5	1.2
28	1.2
20	1.2
14	1.0
10	1.0
6.3	0.9
5	0.9
3.35	0.7
2	0.1
1.18	0.0
0.6	0.0
0.425	0.0
0.3	0.0
0.212	0.0
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP124/B5/1.60	MSord	M SPLITTER	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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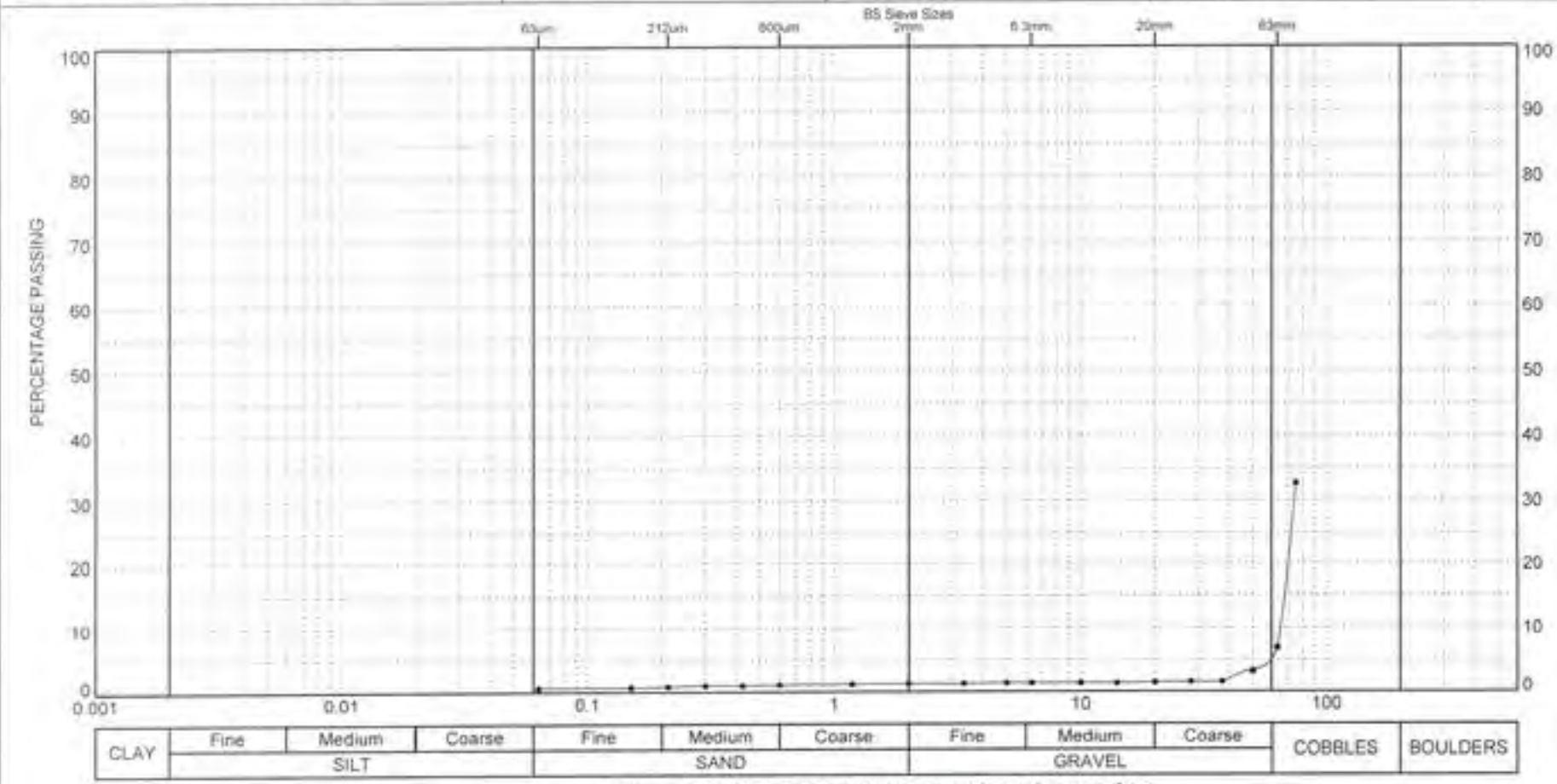
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP125	2.40	LB6	2.40	21/09/2020



Sieve Size (mm)	Passing (%)
75	32.7
63	6.9
50	3.2
37.5	1.6
28	1.6
20	1.5
14	1.4
10	1.4
6.3	1.4
5	1.4
3.35	1.3
2	1.3
1.18	1.2
0.6	1.1
0.425	1.0
0.3	1.0
0.212	0.8
0.15	0.7
0.063	0.6

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP125/LB6/2.40	MSone	CLARK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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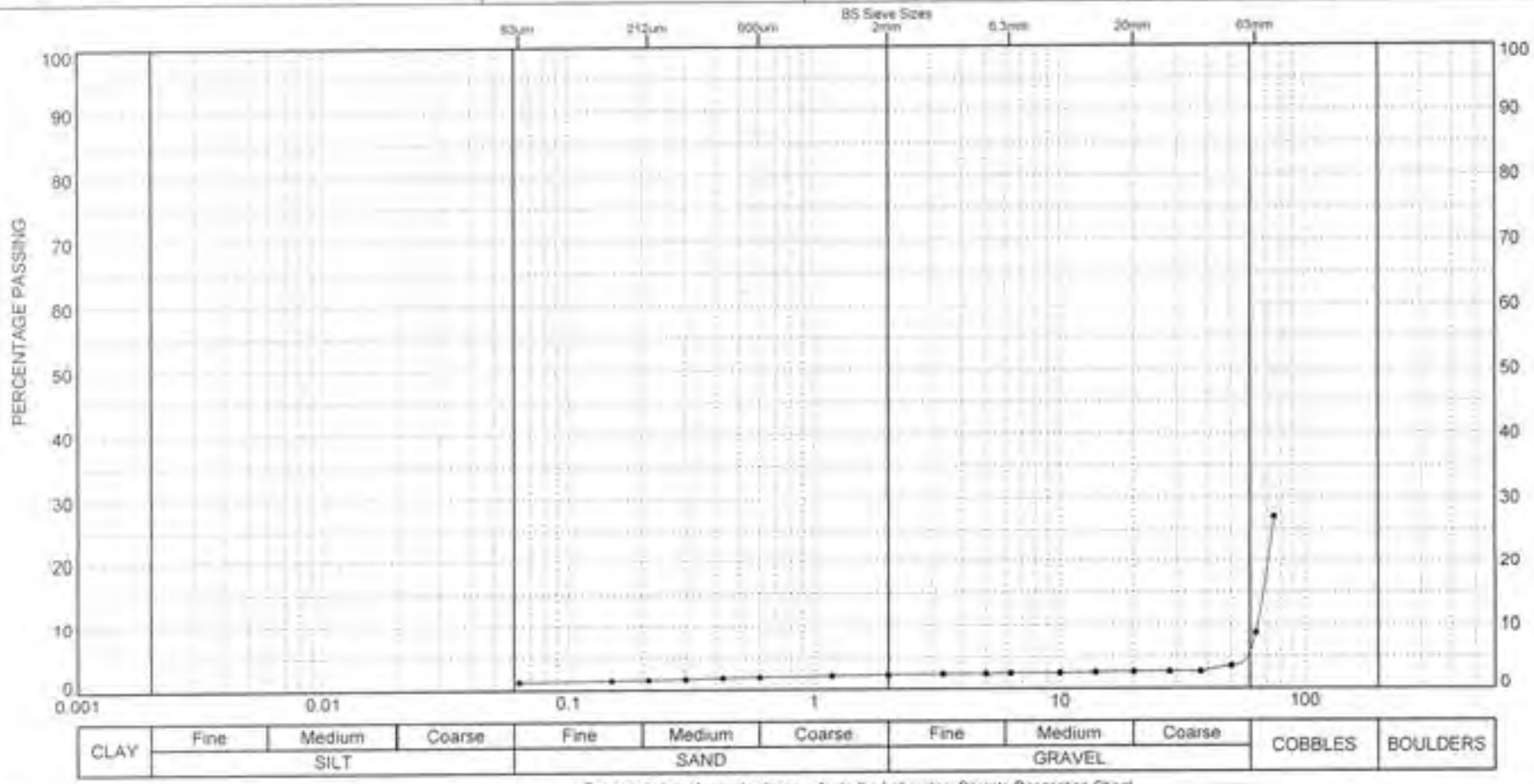
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 700 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP125	4.20	B10	4.20	22/09/2020



Sieve Size (mm)	Passing (%)
75	27.1
63	8.7
50	3.5
37.5	2.7
28	2.7
20	2.7
14	2.6
10	2.5
6.3	2.5
5	2.4
3.35	2.4
2	2.3
1.18	2.2
0.6	2.0
0.425	1.9
0.3	1.7
0.212	1.6
0.15	1.5
0.063	1.3

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP125/B10/4.20			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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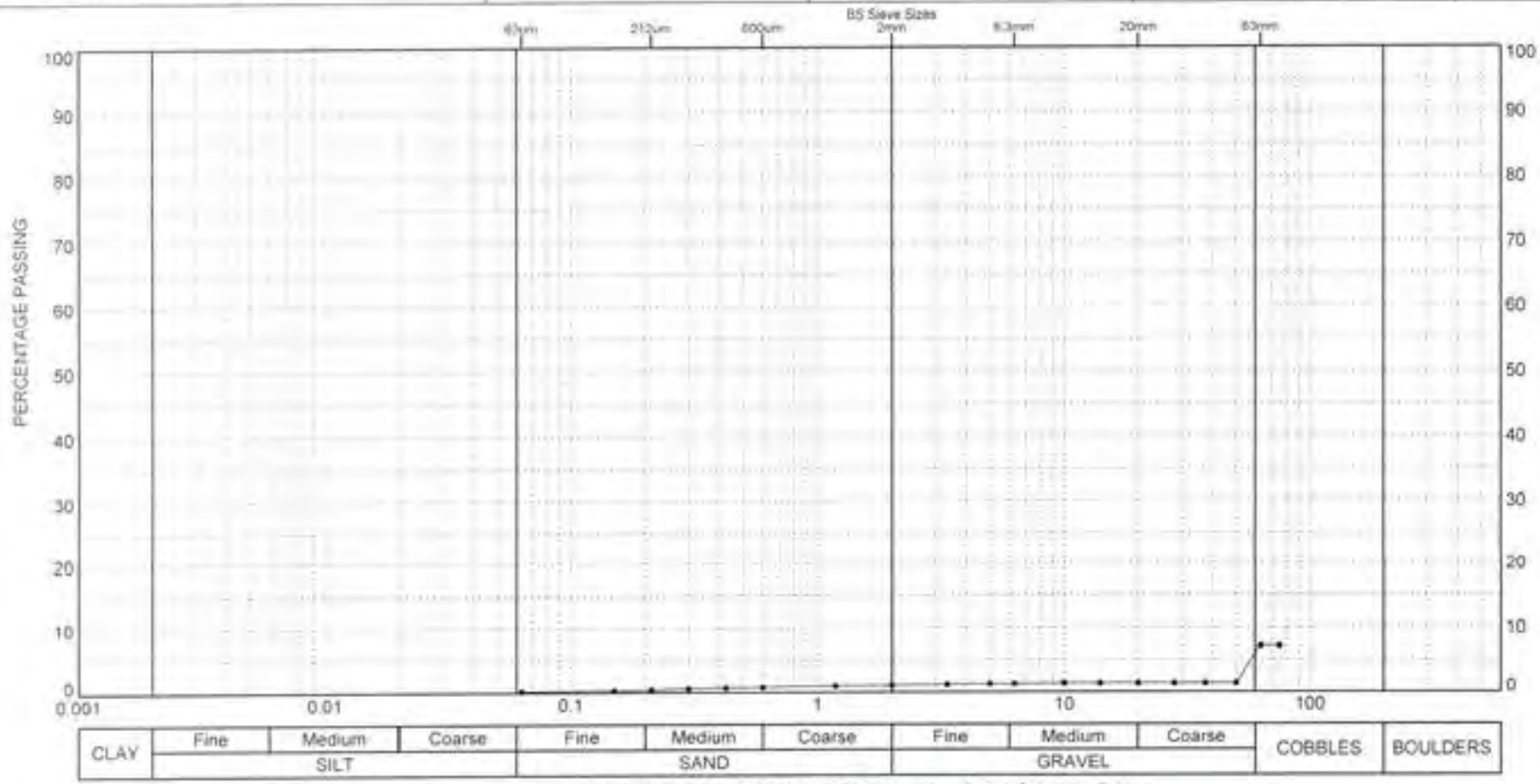
Regional Office: Unit 20, Business Development Centre, Eastern Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- **MPA_AUK_TP126**	Depth (m) :- **0.60**	Sample Type & No :- **B2**	Specific Depth (m) :- **0.60**	Date Tested :- **21/09/2020**



Sieve Size (mm)	Passing (%)
75	7.1
63	7.1
50	1.4
37.5	1.4
28	1.4
20	1.4
14	1.4
10	1.4
6.3	1.3
5	1.3
3.35	1.2
2	1.1
1.18	1.0
0.6	0.8
0.425	0.7
0.3	0.6
0.212	0.4
0.15	0.3
0.063	0.2

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP126/B2/0.60			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

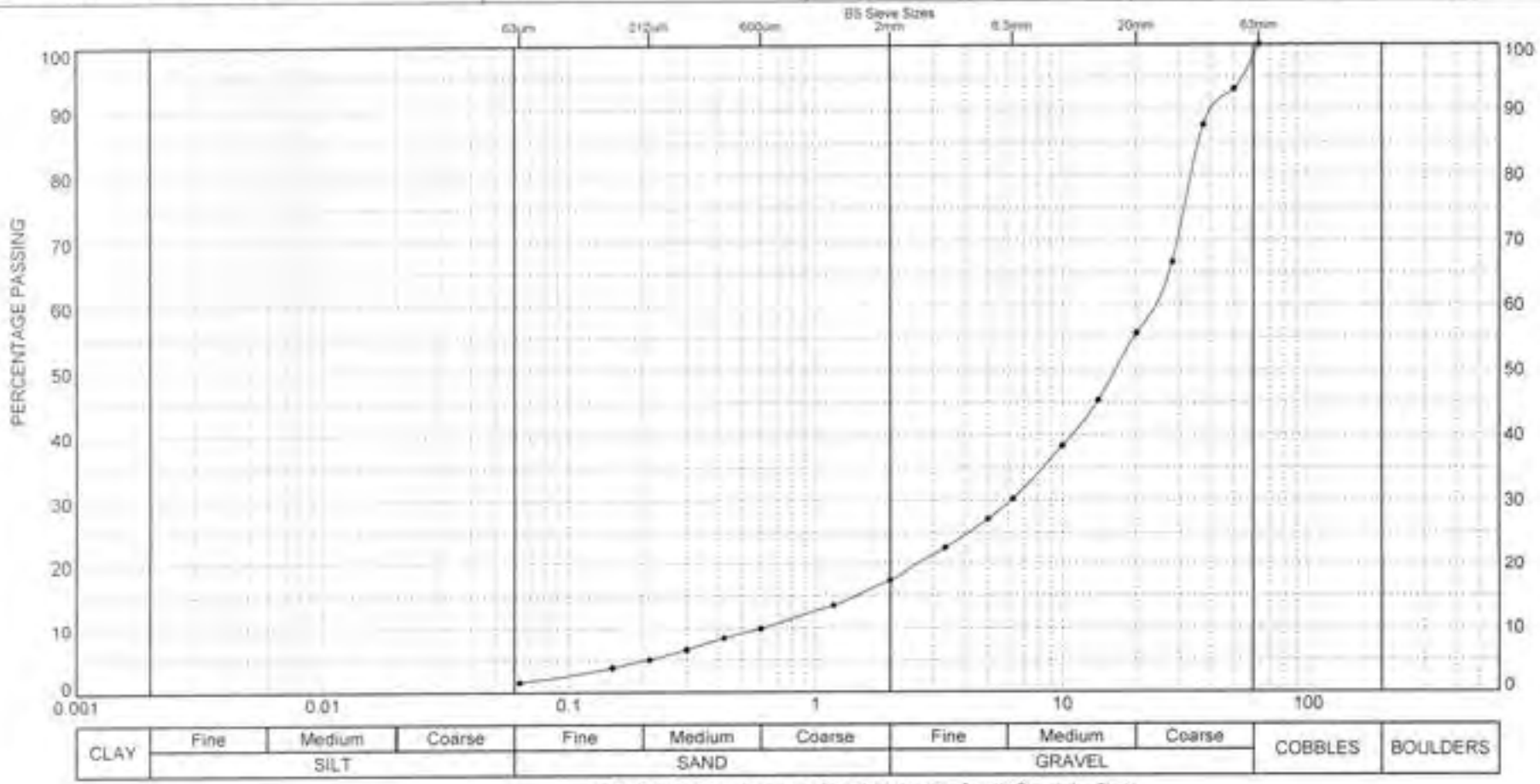
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25,Wells Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham. DH2 2RD - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 20, Riverside Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP127	0.60	B2	0.60	22/09/2020



Sieve Size (mm)	Passing (%)
63	100.0
50	93.2
37.5	87.7
28	66.7
20	55.7
14	45.4
10	38.4
6.3	30.3
5	27.2
3.35	22.8
2	17.5
1.18	13.6
0.6	10.0
0.425	8.4
0.3	6.7
0.212	5.1
0.15	3.8
0.063	1.6

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP127/B2/0.60			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

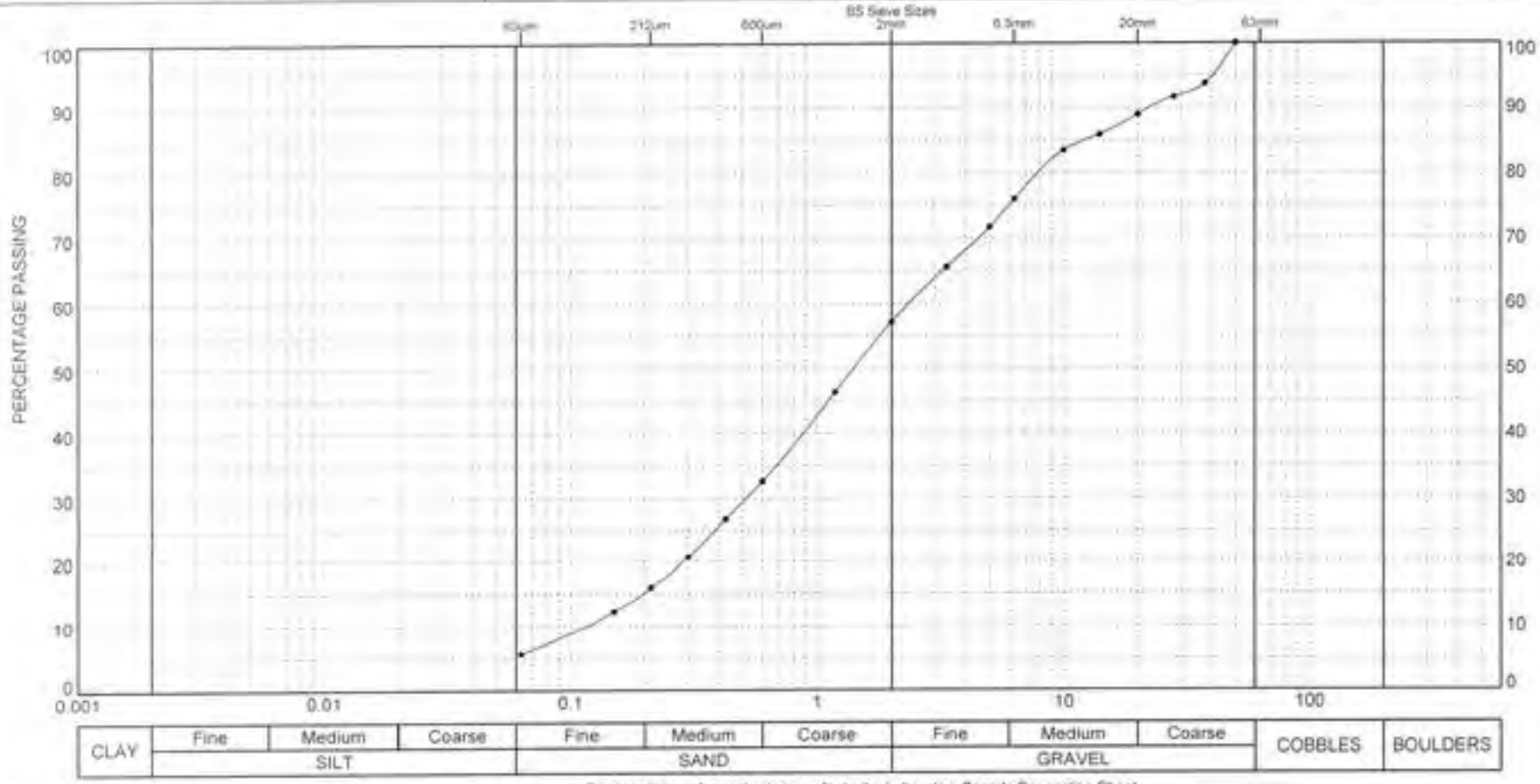
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2NG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 20, Business Development Centre, Earnett Street, Blackburn, BB1 5BL - Tel: 01772 735 500 Fax: 01772 735 599

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP128	0.60	B2	0.60	23/09/2020



Sieve Size (mm)	Passing (%)
50	100.0
37.5	93.7
28	91.7
20	89.0
14	85.9
10	83.5
6.3	76.0
5	71.7
3.35	65.6
2	57.2
1.18	46.4
0.6	32.7
0.425	26.9
0.3	20.8
0.212	15.9
0.15	12.2
0.063	5.8

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP128/B2/0.60	msene	[illegible]	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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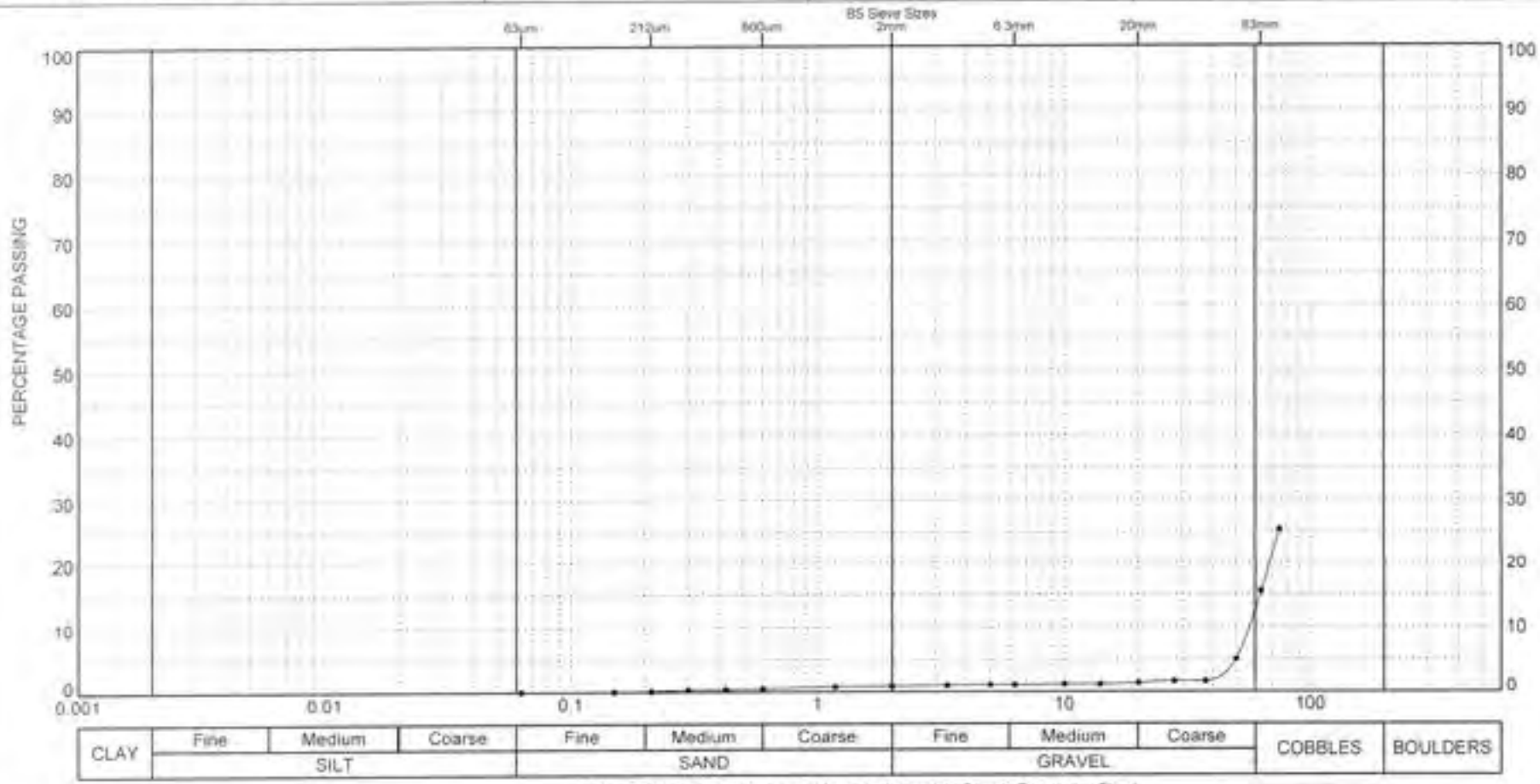
Head Office: Unit 25, Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 700 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP128	3.00	LB8	3.00	17/09/2020



Sieve Size (mm)	Passing (%)
75	25.5
63	15.5
50	5.1
37.5	1.7
28	1.7
20	1.4
14	1.2
10	1.2
6.3	1.1
5	1.1
3.35	1.0
2	0.9
1.18	0.8
0.6	0.5
0.425	0.4
0.3	0.3
0.212	0.1
0.15	0.0
0.063	0.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP128/LB8/3.00			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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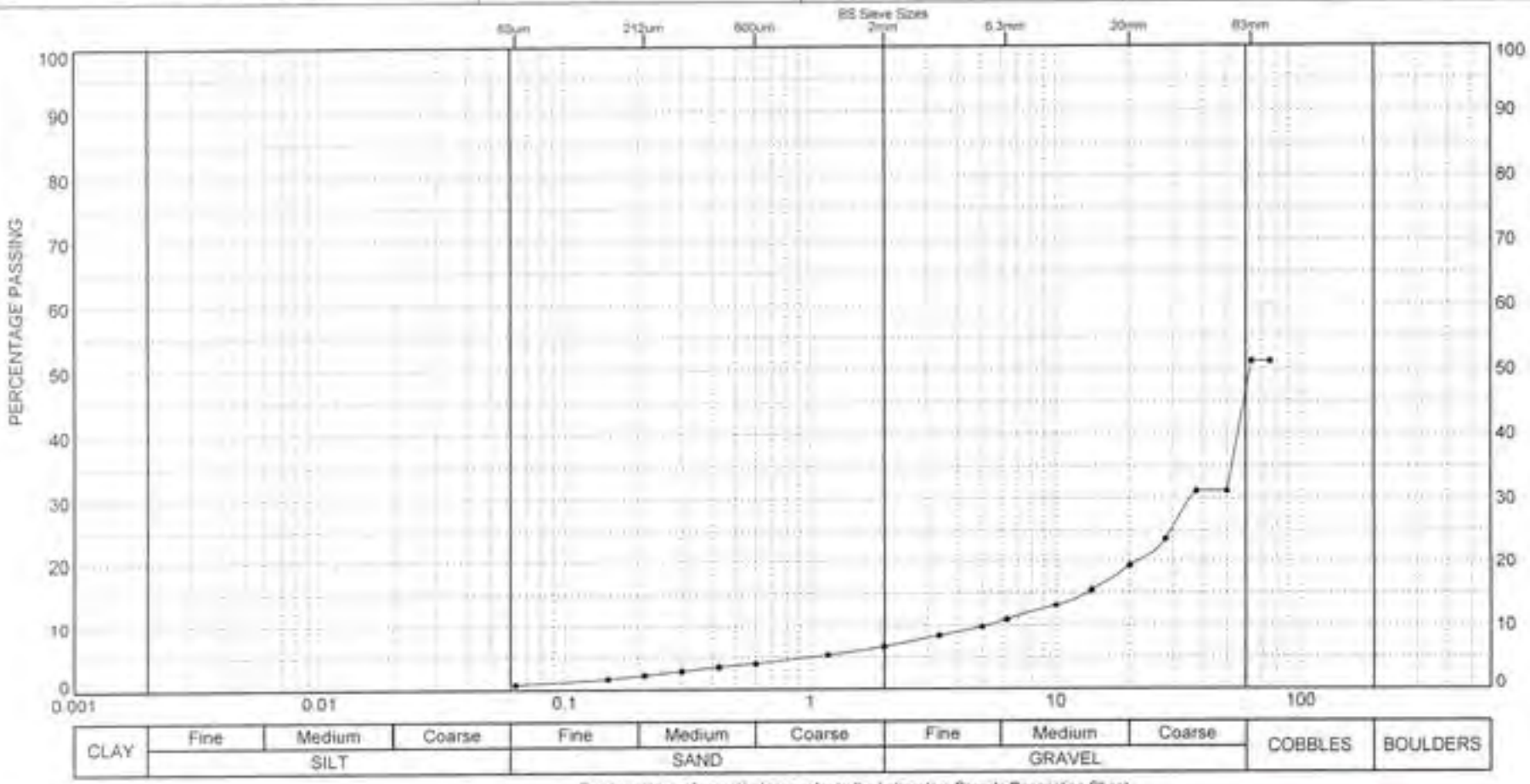
Regional Office: Unit 20, Business Development Centre, Carrum Wharf, Blackburn, BB1 5BL - Tel: 01772 735 500 Fax: 01772 735 599

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP130	0.30	B2	0.30	18/09/2020



Sieve Size (mm)	Passing (%)
75	51.2
63	51.2
50	31.2
37.5	31.2
28	23.8
20	19.3
14	15.4
10	13.1
6.3	10.9
5	9.8
3.35	8.3
2	6.7
1.18	5.4
0.6	4.0
0.425	3.5
0.3	2.9
0.212	2.3
0.15	1.7
0.063	0.8

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP130/B2/0.30		SELKIRK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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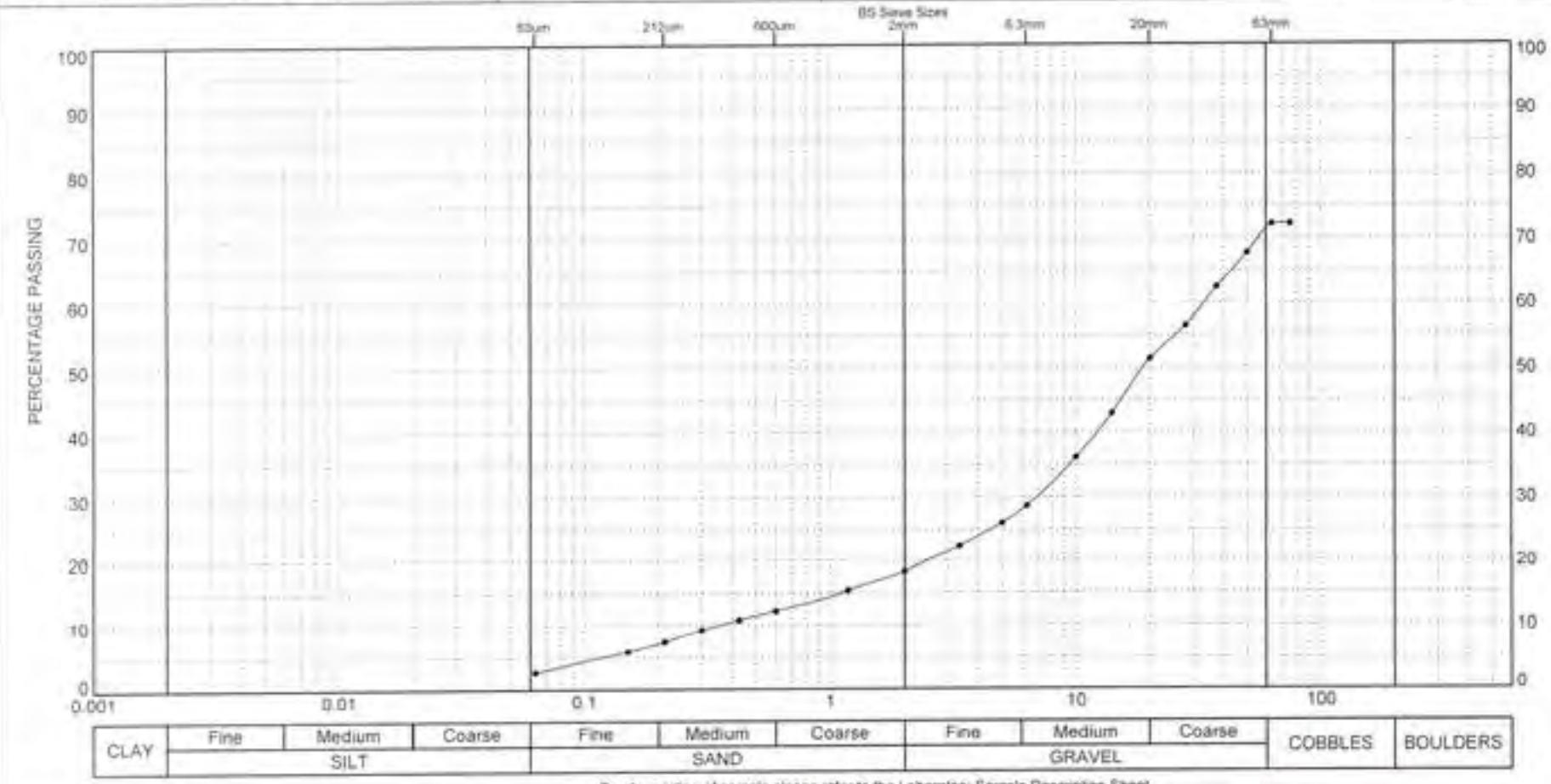
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 309 Fax: 01772 735 866

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :-	Depth (m) :-	Sample Type & No :-	Specific Depth (m) :-	Date Tested :-
MPA_AUK_TP130	**1.30**	**B5**	**1.30**	**21/09/2020**



Sieve Size (mm)	Passing (%)
75	72.2
63	72.2
50	67.7
37.5	62.5
28	56.5
20	51.4
14	43.0
10	36.2
6.3	28.7
5	26.1
3.35	22.5
2	18.4
1.18	15.3
0.6	12.1
0.425	10.8
0.3	9.2
0.212	7.5
0.15	6.0
0.063	2.8

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/MPA_AUK_TP130/B5/1.30			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

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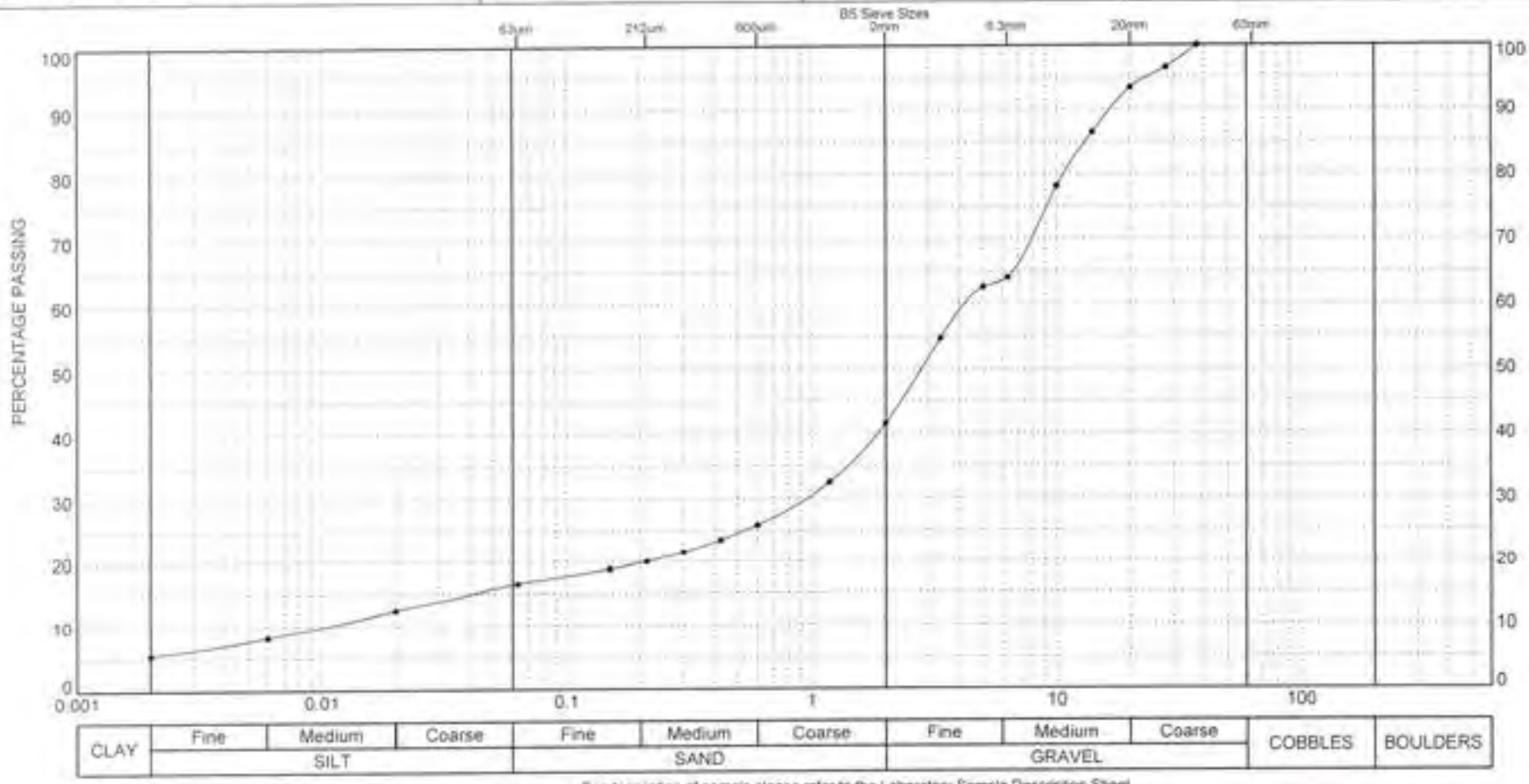
PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- **Stockpile**	Depth (m) :- **0.00**	Sample Type & No :- **B1**	Specific Depth (m) :- **0.00**	Date Tested :- **15/07/2020**



Sieve Size (mm)	Passing (%)
37.5	100.0
28	96.5
20	93.4
14	86.5
10	78.2
6.3	64.1
5	62.6
3.35	54.7
2	41.6
1.18	32.5
0.6	25.9
0.425	23.6
0.3	21.6
0.212	20.0
0.15	18.9
0.063	16.4
0.02	12.3
0.006	8.2
0.002	5.5

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/Stockpile/B1/0.00	MSeal	SELKIRK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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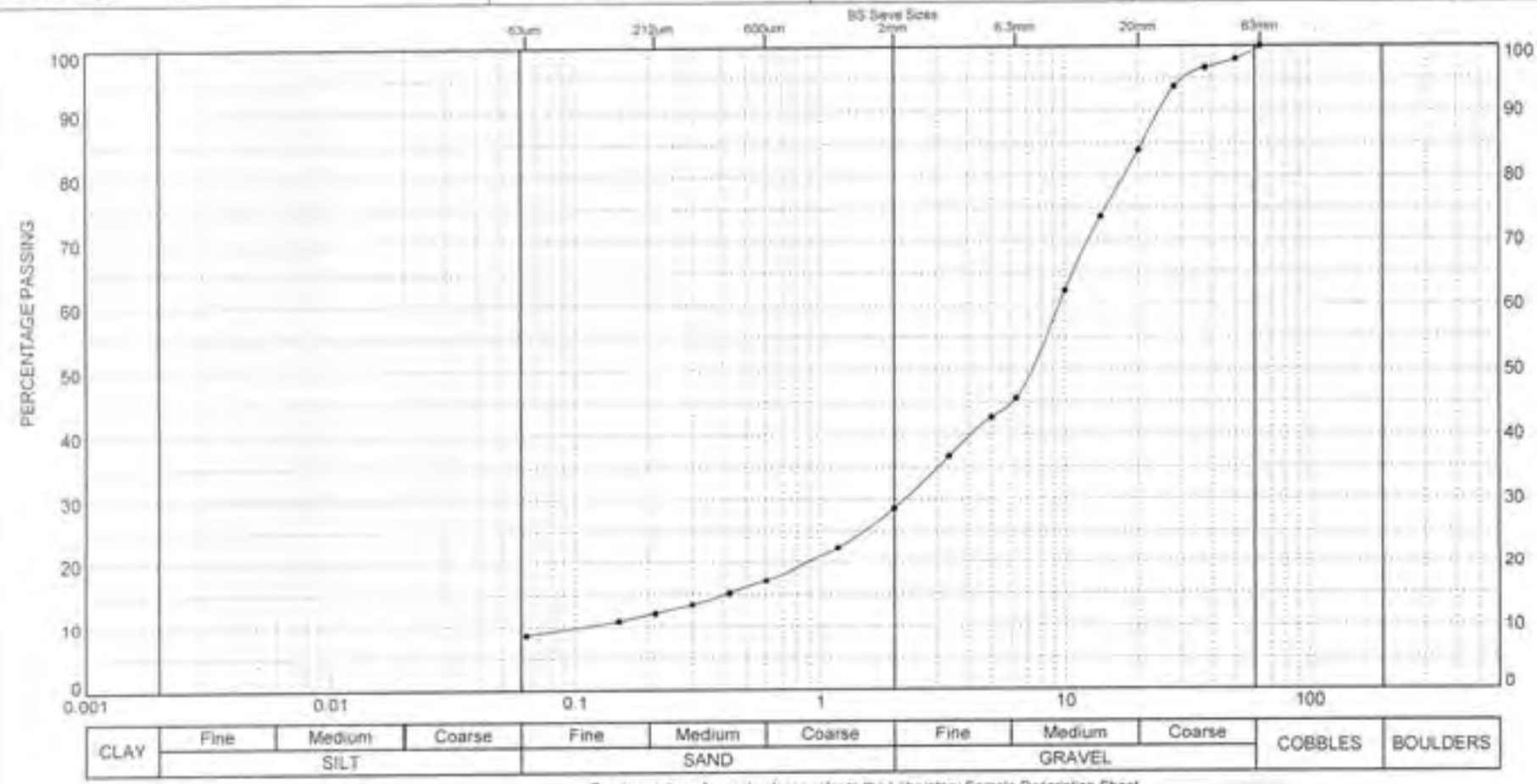
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2NG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 29, Business Development Centre, Euxton Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- **Stockpile**	Depth (m) :- **0.00**	Sample Type & No :- **B2**	Specific Depth (m) :- **0.00**	Date Tested :- **16/07/2020**



Sieve Size (mm)	Passing (%)
63	100.0
50	97.9
37.5	96.6
28	93.7
20	84.0
14	73.7
10	62.2
6.3	45.6
5	42.7
3.35	36.7
2	28.6
1.18	22.5
0.6	17.1
0.425	15.2
0.3	13.4
0.212	12.0
0.15	10.9
0.063	8.6

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/Stockpile/B2/0.00			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

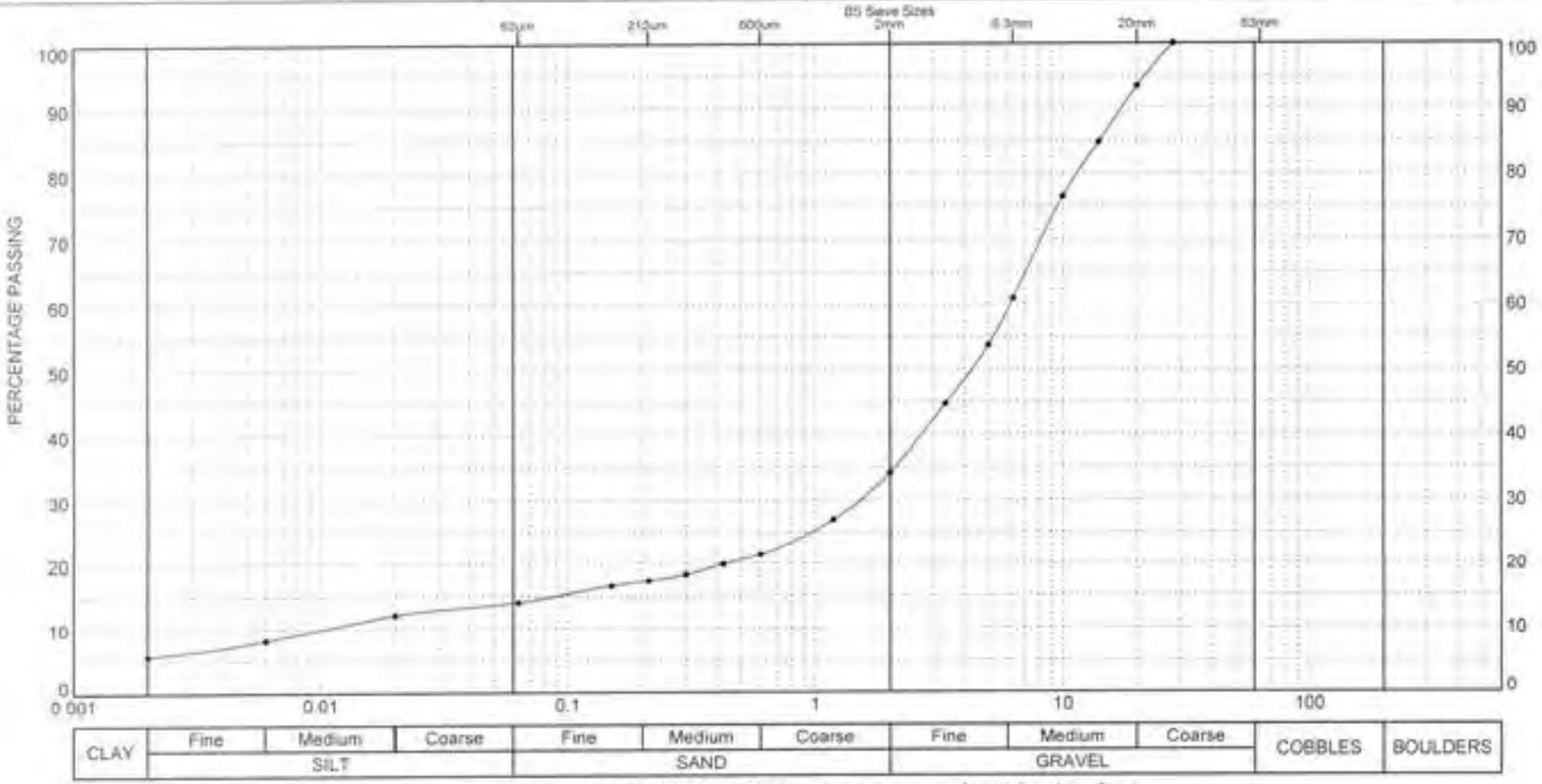
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25,Wells Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2AG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- **Stockpile**	Depth (m) :- **0.00**	Sample Type & No :- **C2**	Specific Depth (m) :- **0.00**	Date Tested :- **17/07/2020**



Sieve Size (mm)	Passing (%)
28	100.0
20	93.4
14	84.8
10	76.5
6.3	61.0
5	53.8
3.35	44.8
2	34.2
1.18	27.0
0.6	21.6
0.425	19.9
0.3	18.4
0.212	17.4
0.15	16.5
0.063	14.1
0.02	12.0
0.006	8.2
0.002	5.8

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/Stockpile/C2/0.00	MBerd	[illegible]	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

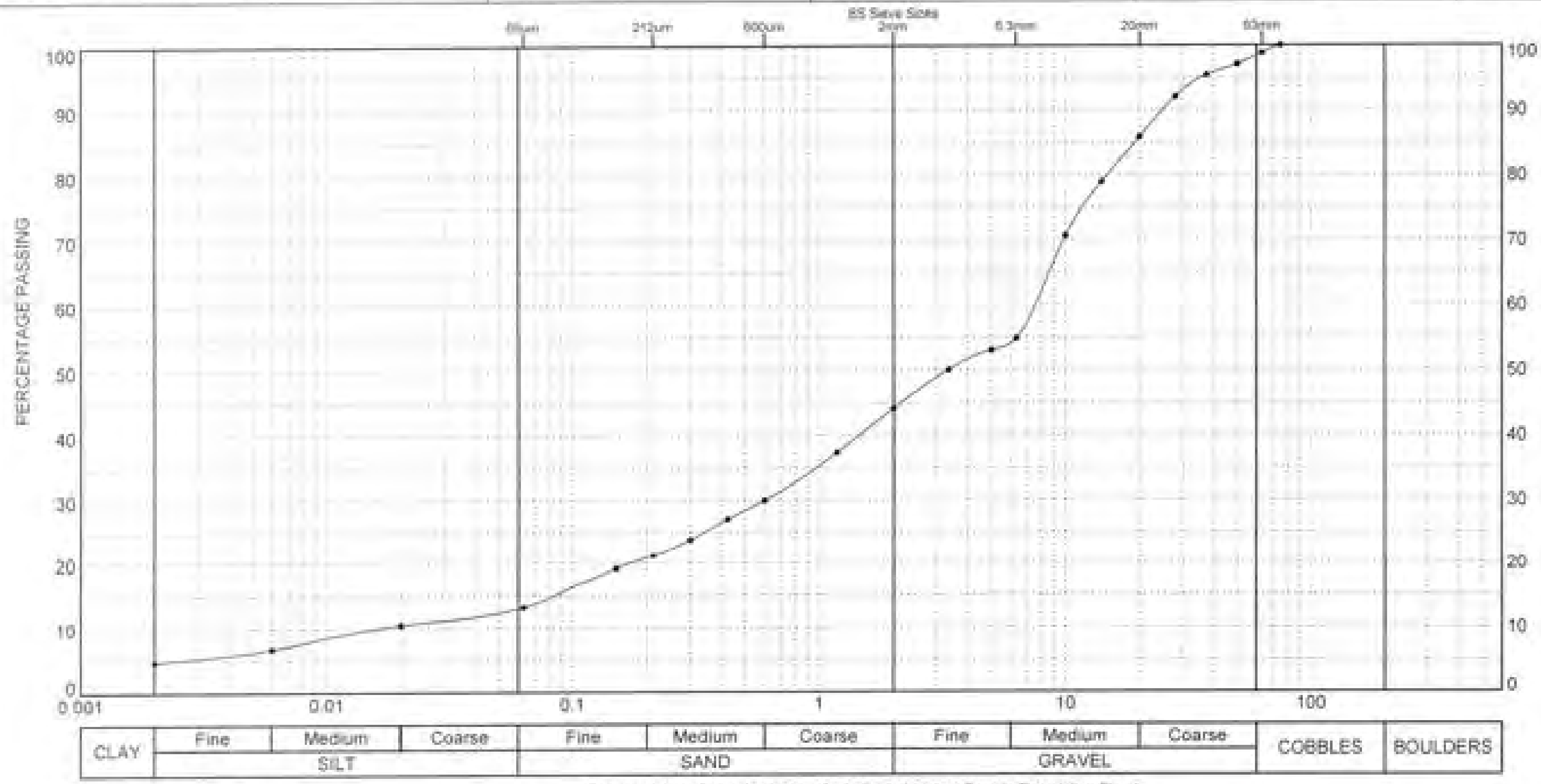
UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- **Stockpile**	Depth (m) :- **0.00**	Sample Type & No :- **B3**	Specific Depth (m) :- **0.00**	Date Tested :- **16/07/2020**



Sieve Size (mm)	Passing (%)
75	100.0
63	98.8
50	97.0
37.5	95.4
28	92.1
20	85.9
14	79.0
10	70.7
6.3	54.9
5	53.1
3.35	50.1
2	44.2
1.18	37.4
0.6	30.0
0.425	27.1
0.3	23.9
0.212	21.3
0.15	19.2
0.063	13.2
0.02	10.5
0.006	6.8
0.002	4.7

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 05/11/2020	Certificate No :- PSD/4291/Stockpile/B3/0.00	Signed :-	Name :-	Page 1 of 1
Client :- South Tees Development Corporation	Contract Title :- Metal Processing Area Shallow Soils Investigation			AEG Contract No :- 4291

UKAS TESTING 1367

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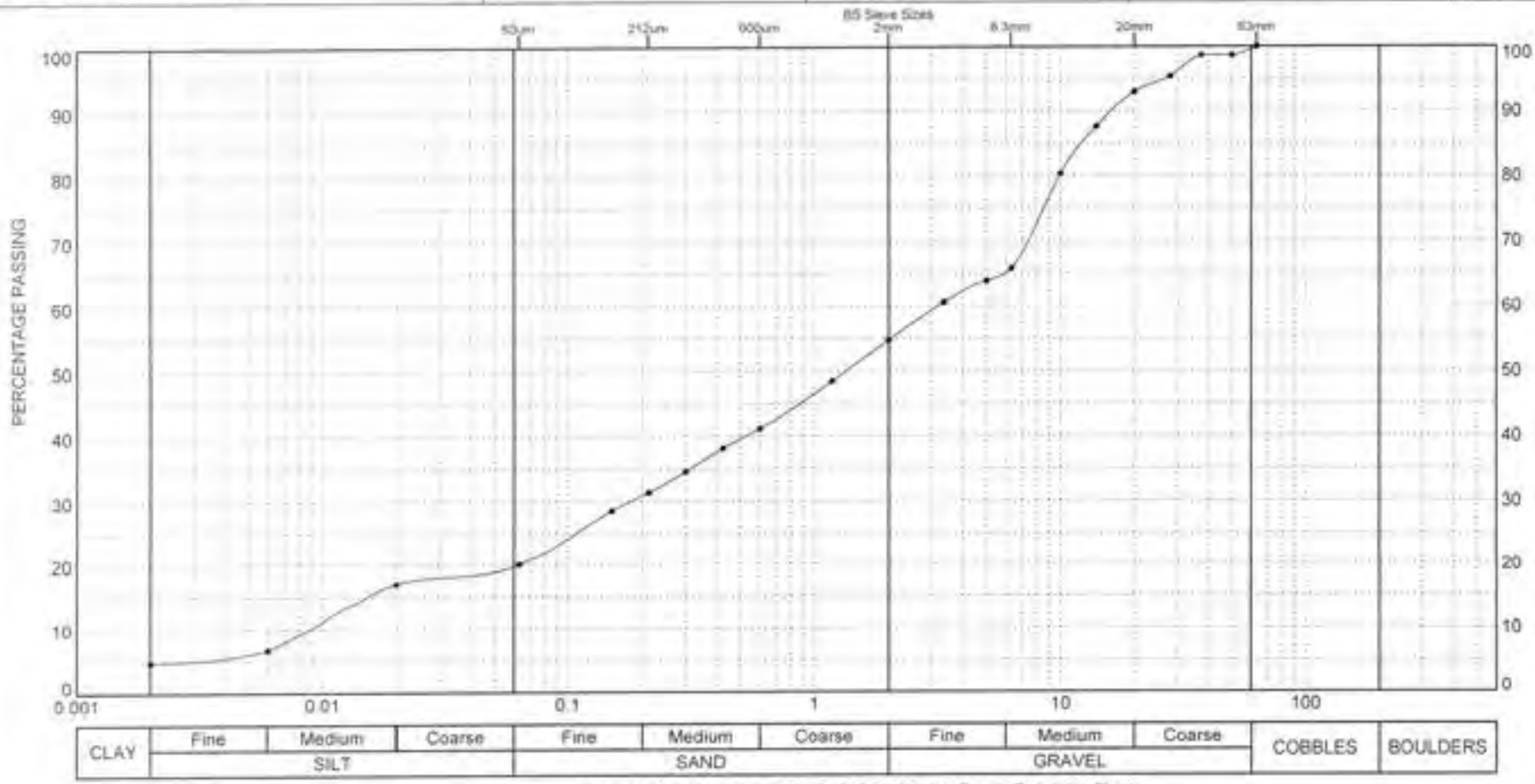
Regional Office: Unit 20, Business Development Centre, Eamont Wharf, Blackburn, BB1 5BL - Tel: 01772 735 700 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- **Stockpile**	Depth (m) :- **0.00**	Sample Type & No :- **B4**	Specific Depth (m) :- **0.00**	Date Tested :- **17/07/2020**



Sieve Size (mm)	Passing (%)
63	100.0
50	98.6
37.5	98.6
28	95.4
20	93.0
14	87.7
10	80.4
6.3	65.8
5	63.9
3.35	60.6
2	54.6
1.18	48.5
0.6	41.2
0.425	38.2
0.3	34.6
0.212	31.4
0.15	28.6
0.063	20.0
0.02	16.9
0.006	6.8
0.002	4.7

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/Stockpile/B4/0.00			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

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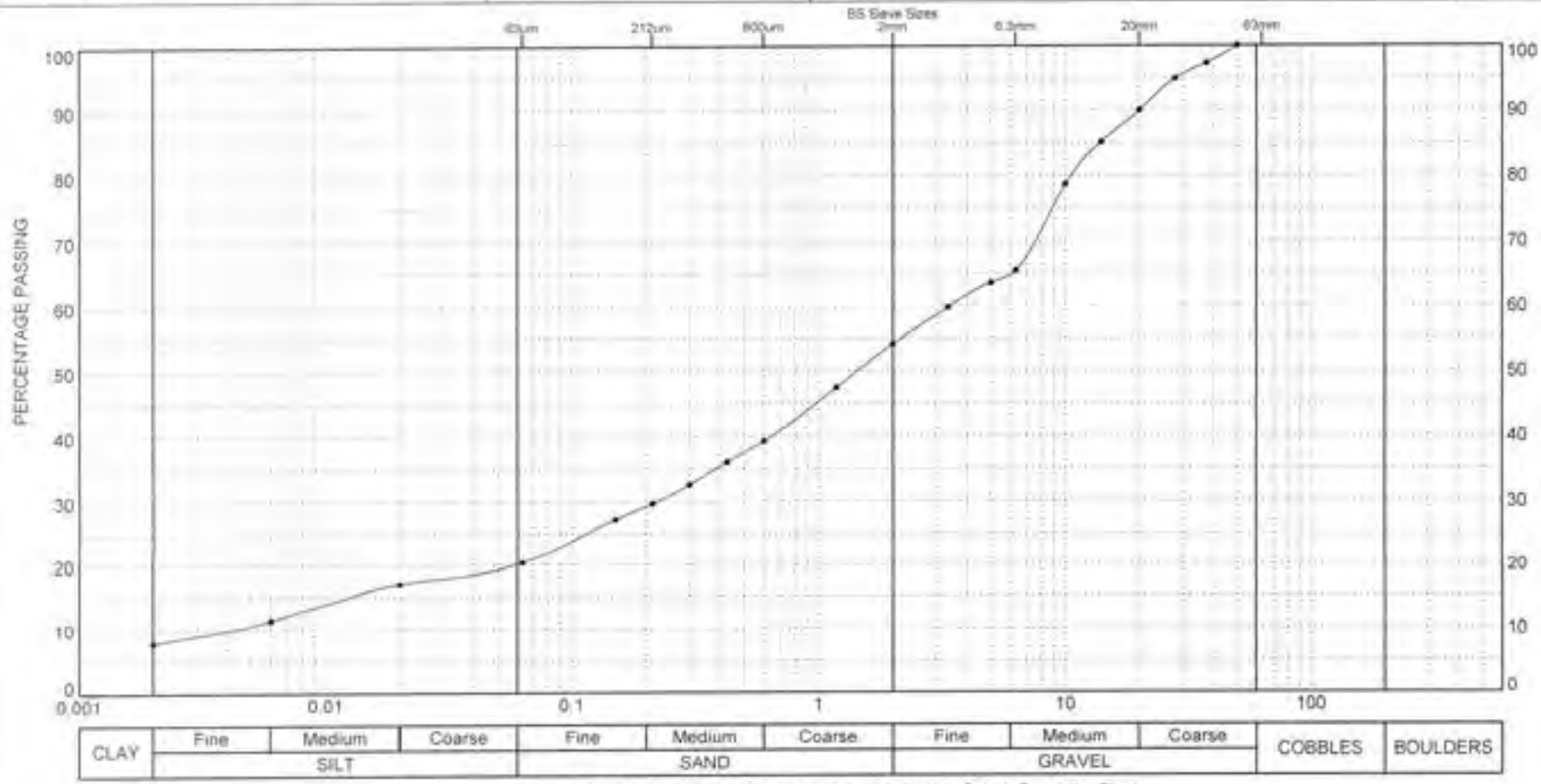
Regional Office: Unit 20, Rosemosa Development Centre, Eanam Wharf, Blackburn, BB1 5RL. - Tel: 01772 735 300 Fax: 01772 735 599

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- **Stockpile**	Depth (m) :- **0.00**	Sample Type & No :- **B5**	Specific Depth (m) :- **0.00**	Date Tested :- **17/07/2020**



Sieve Size (mm)	Passing (%)
50	100.0
37.5	97.2
28	94.9
20	90.0
14	85.2
10	78.7
6.3	65.5
5	63.6
3.35	59.9
2	54.2
1.18	47.5
0.6	39.3
0.425	36.1
0.3	32.6
0.212	29.7
0.15	27.3
0.063	20.4
0.02	17.0
0.006	11.4
0.002	7.9

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/Stockpile/B5/0.00			

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

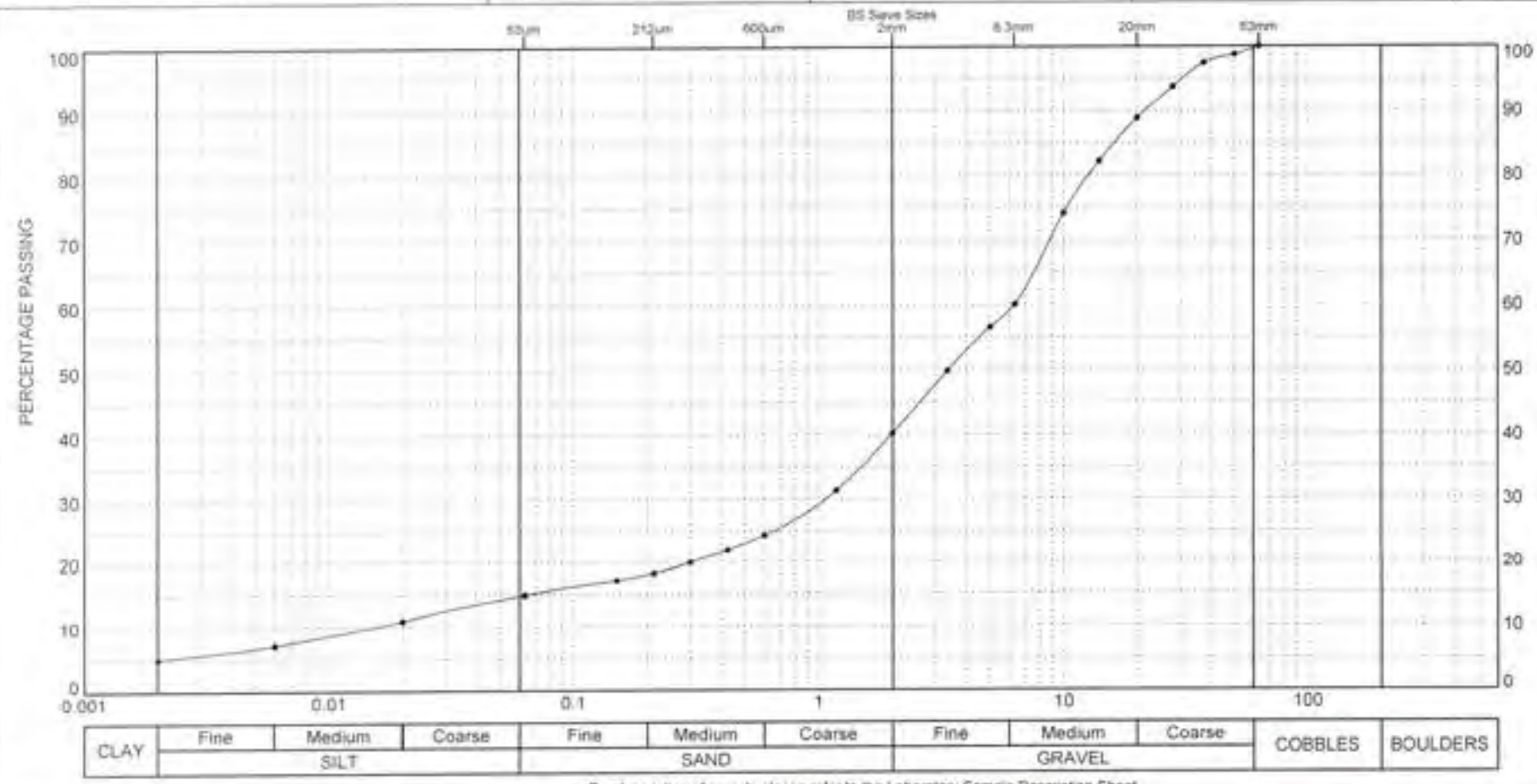
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG. Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 2C, Business Development Centre, Eanam Wharf, Blackburn, BB1 5RL. Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- **Stockpile**	Depth (m) :- **0.00**	Sample Type & No :- **B6**	Specific Depth (m) :- **0.00**	Date Tested :- **17/07/2020**



Sieve Size (mm)	Passing (%)
63	100.0
50	98.7
37.5	97.4
28	93.7
20	88.9
14	82.2
10	74.2
6.3	60.1
5	56.6
3.35	49.9
2	40.3
1.18	31.4
0.6	24.4
0.425	22.1
0.3	19.9
0.212	18.3
0.15	17.1
0.063	14.9
0.02	10.9
0.006	7.2
0.002	5.0

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :-	Certificate No :-	Signed :-	Name :-	Page 1 of 1
05/11/2020	PSD/4291/Stockpile/B6/0.00	MSone	[illegible] CLARK	

Client :-	Contract Title :-	AEG Contract No :-
South Tees Development Corporation	Metal Processing Area Shallow Soils Investigation	4291

UKAS TESTING 1367

LABORATORY TESTING ENCLOSURE 5

Determination of Calorific Value, Total Sulphur, Sulphate and pH (Tested Externally)

DETS

Certificate of Analysis

Certificate Number 20-12670 11-Nov-20

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 20-12670

Client Reference 4291

Order No LA2369

Contract Title Metal Processing Area Shallow Soils Investigation

Description 3 Soil samples.

Date Received 15-Jul-20

Date Started 15-Jul-20

Date Completed 11-Nov-20

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

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis

Soil Samples

Our Ref 20-12670
Client Ref 4291
Contract Title Metal Processing Area Shallow Soils Investigation

			Lab No	1697822	1697823	1697824
			Sample ID	Stockpile	Stockpile	Stockpile
			Depth	0	0	0
			Other ID	1	2	3
			Sample Type	B	B	B
			Sampling Date	08/07/2020	08/07/2020	08/07/2020
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Inorganics						
pH	DETSC 2008#		pH	9.3	9.5	9.3
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	190	96	190
Sulphur as S, Total	DETSC 2320	0.01	%	0.93	0.57	0.68

Information in Support of the Analytical Results

Our Ref 20-12670
Client Ref 4291
Contract Metal Processing Area Shallow Soils Investigation

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1697822	Stockpile 0 SOIL	08/07/20	PT 500ml		
1697823	Stockpile 0 SOIL	08/07/20	PT 500ml		
1697824	Stockpile 0 SOIL	08/07/20	PT 500ml		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received where by 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 20-18899

11-Nov-20

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 20-18899

Client Reference 4291

Order No LA 2395

Contract Title Metal Processing Area Shallow Soils Investigation

Description 20 Soil samples.

Date Received 28-Sep-20

Date Started 28-Sep-20

Date Completed 11-Nov-20

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

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis

Soil Samples

Our Ref 20-18899
Client Ref 4291
Contract Title Metal Processing Area Shallow Soils Investigation

				Lab No	1734061	1734062	1734063	1734064	1734065	1734066
					MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP1
				Sample ID	03	05	06	06	07	08
				Depth	0.6	0.4	0.5	2.6	0.5	0.6
				Other ID	1	1	1	7	1	1
				Sample Type	1	1	1	1	1	1
				Sampling Date	09/07/2020	09/07/2020	08/07/2020	08/07/2020	08/07/2020	09/07/2020
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Inorganics										
pH	DETSC 2008#		pH				11.5	10.1		
Calorific Value	DETSC 5008	1	MJ/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l				490	1700		

key: # MCERTS (accreditation only applies if report carries the MCERTS logo), n/s not supplied.

Summary of Chemical Analysis

Soil Samples

Our Ref 20-18899
Client Ref 4291
Contract Title Metal Processing Area Shallow Soils Investigation

				Lab No	1734067	1734068	1734069	1734070	1734071	1734072	1734073	1734074	1734075
					MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP1	MPA_AUK_TP	MPA_AUK_TP
				Sample ID	08	09	12	15	16	17	19	120	124
				Depth	1.6	2.6	2.6	0.4	1.4	3.3	1.4	3.6	3.7
				Other ID	4	7	7	1	4	9	4	9	9
				Sample Type	J	J	J	J	J	J	J	J	J
				Sampling Date	09/07/2020	06/07/2020	08/07/2020	06/07/2020	06/07/2020	08/07/2020	06/07/2020	07/07/2020	07/07/2020
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**										
Inorganics													
pH	DETSC 2008#		pH			11.2			12.3	12.3		11.9	11.2
Calorific Value	DETSC 5008	1	MJ/kg		< 1.0		< 1.0	< 1.0		< 1.0	< 1.0		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l			740			23	400		570	1400

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo) n/s - not supplied

Summary of Chemical Analysis

Soil Samples

Our Ref 20-18899
Client Ref 4291
Contract Title Metal Processing Area Shallow Soils Investigation

			Lab No	1734076	1734077	1734078	1734079	1734080
				MPA_AUK_TP	MPA_AUK_TP	MPA_AUK_TP	MPA_AUK_TP	MPA_AUK_TP
			Sample ID	126	127	127	128	128
			Depth	0.4	0.4	1.6	0.4	1.6
			Other ID	1	1	4	3	9
			Sample Type	J	J	J	J	J
			Sampling Date	13/07/2020	10/07/2020	10/07/2020	10/07/2020	10/07/2020
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
Inorganics								
pH	DETSC 2008#		pH	12.1			12.0	
Calorific Value	DETSC 5008	1	MJ/kg		< 1.0	< 1.0		< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	55			18	

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s - not supplied.

Information in Support of the Analytical Results

Our Ref 20-18899
Client Ref 4291
Contract Metal Processing Area Shallow Soils Investigation

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1734061	MPA_AUK_TP103 0.6 SOIL	09/07/20	PT 1L		
1734062	MPA_AUK_TP105 0.4 SOIL	09/07/20	PT 1L		
1734063	MPA_AUK_TP106 0.5 SOIL	08/07/20	PT 1L	Anions 2:1 (10 days), pH + Conductivity (7 days)	
1734064	MPA_AUK_TP106 2.6 SOIL	08/07/20	PT 1L	Anions 2:1 (10 days), pH + Conductivity (7 days)	
1734065	MPA_AUK_TP107 0.5 SOIL	08/07/20	PT 1L		
1734066	MPA_AUK_TP108 0.6 SOIL	09/07/20	PT 1L		
1734067	MPA_AUK_TP108 1.6 SOIL	09/07/20	PT 1L		
1734068	MPA_AUK_TP109 2.6 SOIL	06/07/20	PT 1L	Anions 2:1 (10 days), pH + Conductivity (7 days)	
1734069	MPA_AUK_TP112 2.6 SOIL	08/07/20	PT 1L		
1734070	MPA_AUK_TP115 0.4 SOIL	06/07/20	PT 1L		
1734071	MPA_AUK_TP116 1.4 SOIL	06/07/20	PT 1L	Anions 2:1 (10 days), pH + Conductivity (7 days)	
1734072	MPA_AUK_TP117 3.3 SOIL	08/07/20	PT 1L	Anions 2:1 (10 days), pH + Conductivity (7 days)	
1734073	MPA_AUK_TP119 1.4 SOIL	06/07/20	PT 1L		
1734074	MPA_AUK_TP120 3.6 SOIL	07/07/20	PT 1L	Anions 2:1 (10 days), pH + Conductivity (7 days)	
1734075	MPA_AUK_TP124 3.7 SOIL	07/07/20	PT 1L	Anions 2:1 (10 days), pH + Conductivity (7 days)	
1734076	MPA_AUK_TP126 0.4 SOIL	13/07/20	PT 1L	Anions 2:1 (10 days), pH + Conductivity (7 days)	
1734077	MPA_AUK_TP127 0.4 SOIL	10/07/20	PT 1L		
1734078	MPA_AUK_TP127 1.6 SOIL	10/07/20	PT 1L		
1734079	MPA_AUK_TP128 0.4 SOIL	10/07/20	PT 1L	Anions 2:1 (10 days), pH + Conductivity (7 days)	
1734080	MPA_AUK_TP128 3.6 SOIL	10/07/20	PT 1L		

Key: P-Plastic 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 425um sieve, in accordance with BS 1377.

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 25°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

LABORATORY TESTING ENCLOSURE 6

Determination of Dry Density/Moisture Content Relationship

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990 (Test deviated from standard due to excessive coarse material)

Specimen Identification

Exploratory Hole No :- **MPA_AUK_TP105** Depth (m) :- **0.70** Sample Type & No :- **B2**

Test Method 4.5kg Compaction Single Sample

Test Results

Optimum Moisture Content (%) = **6.3**

Particle Density (Assumed) = **3.50**

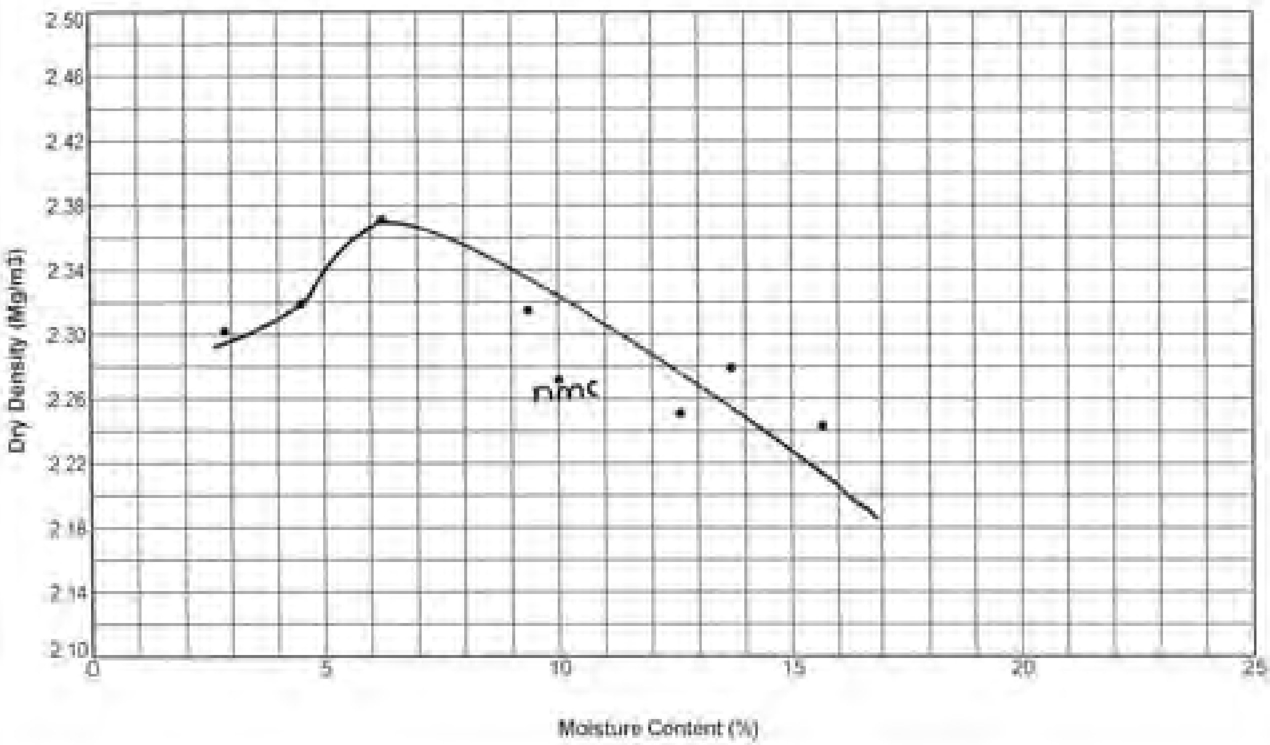
Maximum Dry Density (Mg/m3) = **2.37**

Retained on 20mm Sieve (%) = **28.0**

Date Tested = **23/09/2020**

Retained on 37.5mm Sieve (%) = **4.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation	Client :- South Tees Development Corporation

Signed :- [signature]	Name :-	Page 1 of 1
Date of issue :- 05/11/2020	Certificate No :- COMP/4291/1	AEG Contract No :- 4291

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990 (Test deviated from standard due to excessive coarse material)

Specimen Identification

Exploratory Hole No :- **MPA_AUK_TP110** Depth (m) :- **0.80** Sample Type & No :- **B2**

Test Method 4.5kg Compaction Single Sample

Test Results

Optimum Moisture Content (%) = **9.0**

Particle Density (Measured) = **3.36**

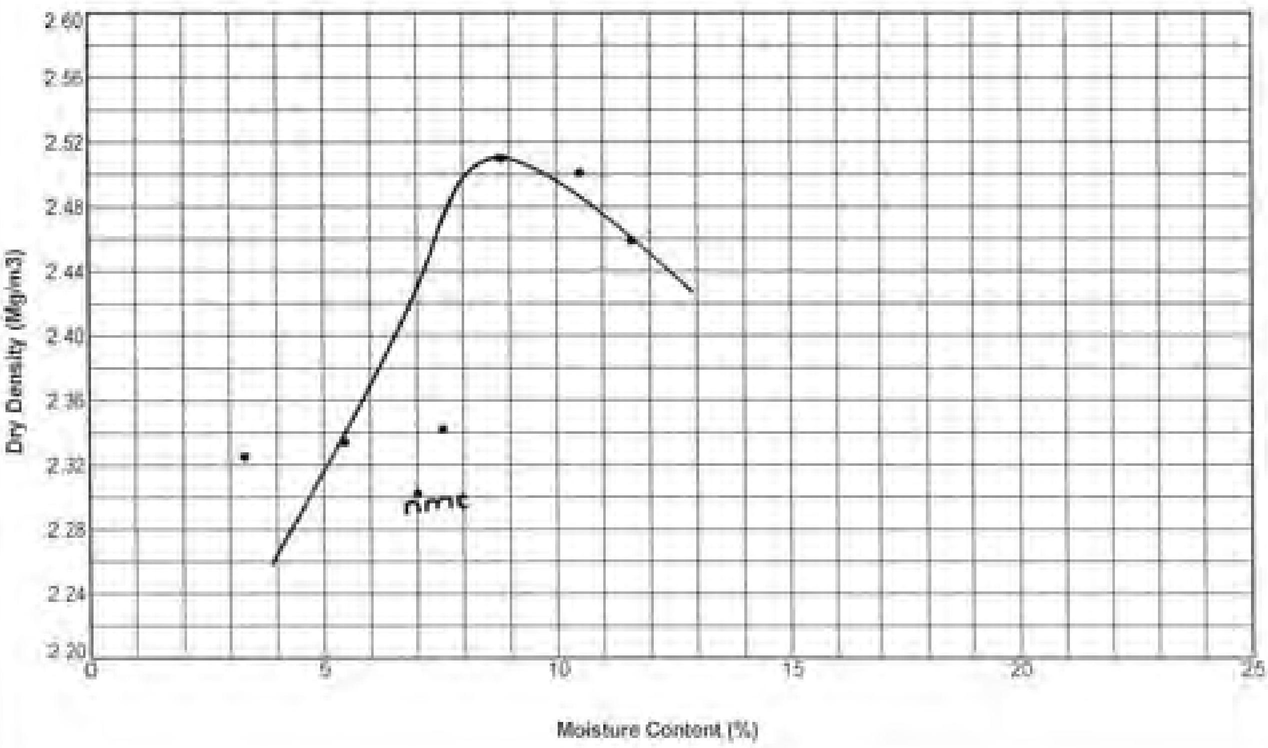
Maximum Dry Density (Mg/m3) = **2.51**

Retained on 20mm Sieve (%) = **35.0**

Date Tested = **18/09/2020**

Retained on 37.5mm Sieve (%) = **15.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation	Client :- South Tees Development Corporation

Signed :-	Name :-	Page 1 of 1
Date of Issue :- 05/11/2020	Certificate No :- COMP/4291/1	AEG Contract No :- 4291

1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990 (Test deviated from standard due to excessive coarse material)

Specimen Identification

Exploratory Hole No :- **MPA_AUK_TP115** Depth (m) :- **0.50** Sample Type & No :- **B2**

Test Method 4.5kg Compaction Single Sample

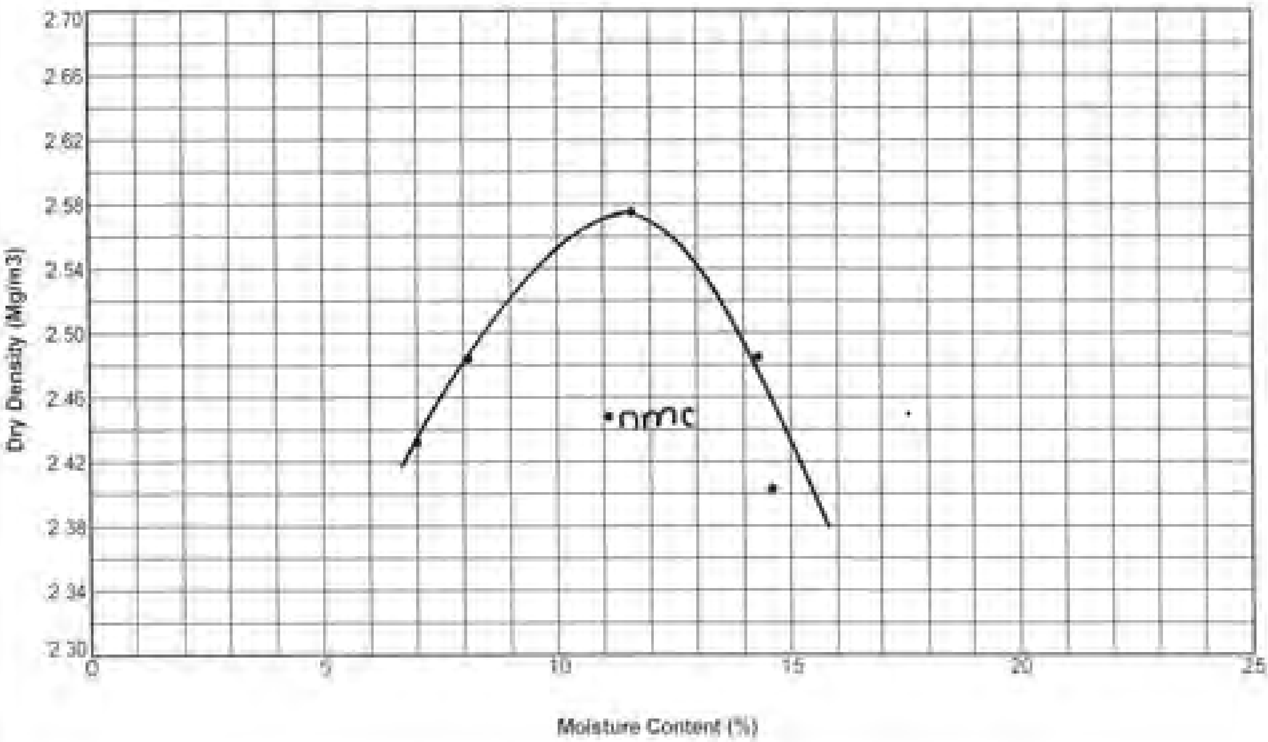
Test Results

Optimum Moisture Content (%) = **11.6** Particle Density (Assumed) = **3.85**

Maximum Dry Density (Mg/m3) = **2.58** Retained on 20mm Sieve (%) = **21.0**

Date Tested = **18/09/2020** Retained on 37.5mm Sieve (%) = **4.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation

Client :- South Tees Development Corporation

Signed :- Name :- Page 1 of 1

Date of issue :- 05/11/2020 Certificate No :- COMP/4291/1 AEG Contract No :- 4291

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990 (Test deviated from standard due to excessive coarse material)

Specimen Identification

Exploratory Hole No :- **MPA_AUK_TP128** Depth (m) :- **0.60** Sample Type & No :- **B2**

Test Method 4.5kg Compaction Single Sample

Test Results

Optimum Moisture Content (%) = **6.8**

Particle Density (Measured) = **4.50**

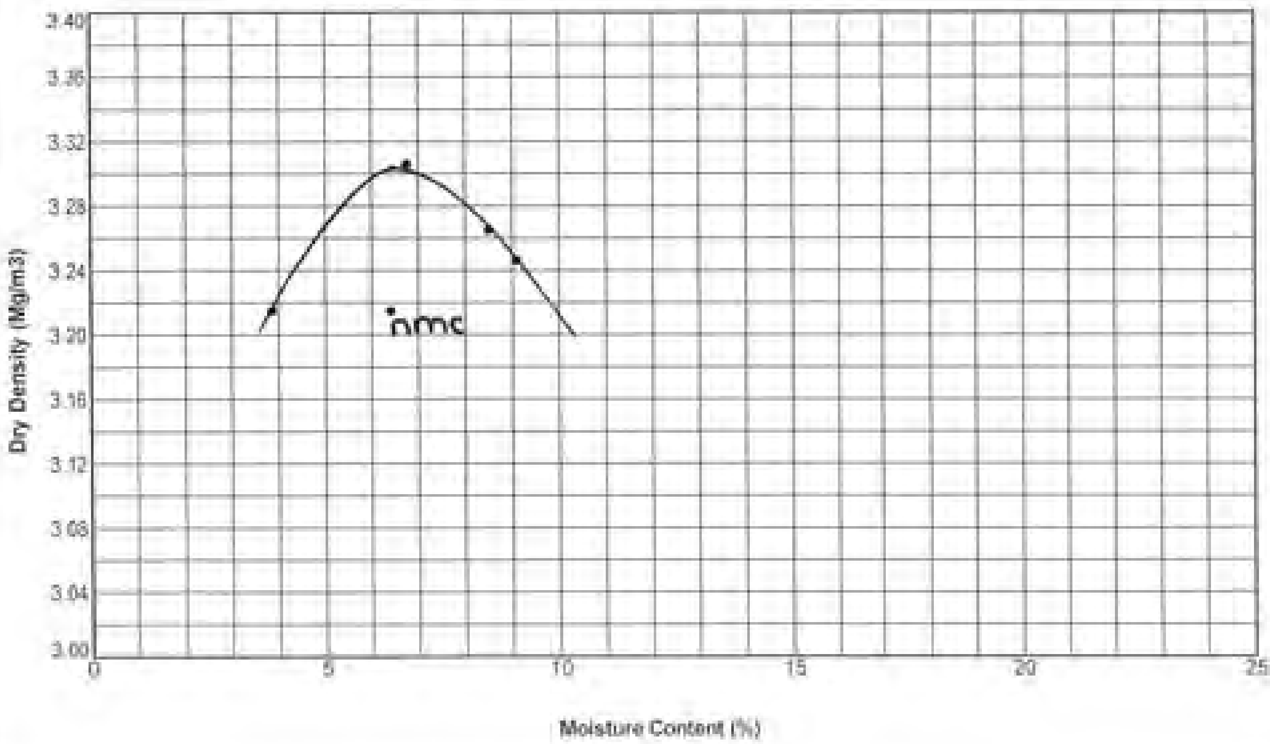
Maximum Dry Density (Mg/m3) = **3.31**

Retained on 20mm Sieve (%) = **11.0**

Date Tested = **23/09/2020**

Retained on 37.5mm Sieve (%) = **6.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation	Client :- South Tees Development Corporation

Signed :-	Name :-	Page 1 of 1
Date of Issue :- 06/11/2020	Certificate No :- COMP/4291/1	AEG Contract No. :- 4291

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **BOS1** Depth (m) :- **0.00** Sample Type & No :- **B**

Test Method 2.5kg Compaction Separate Samples

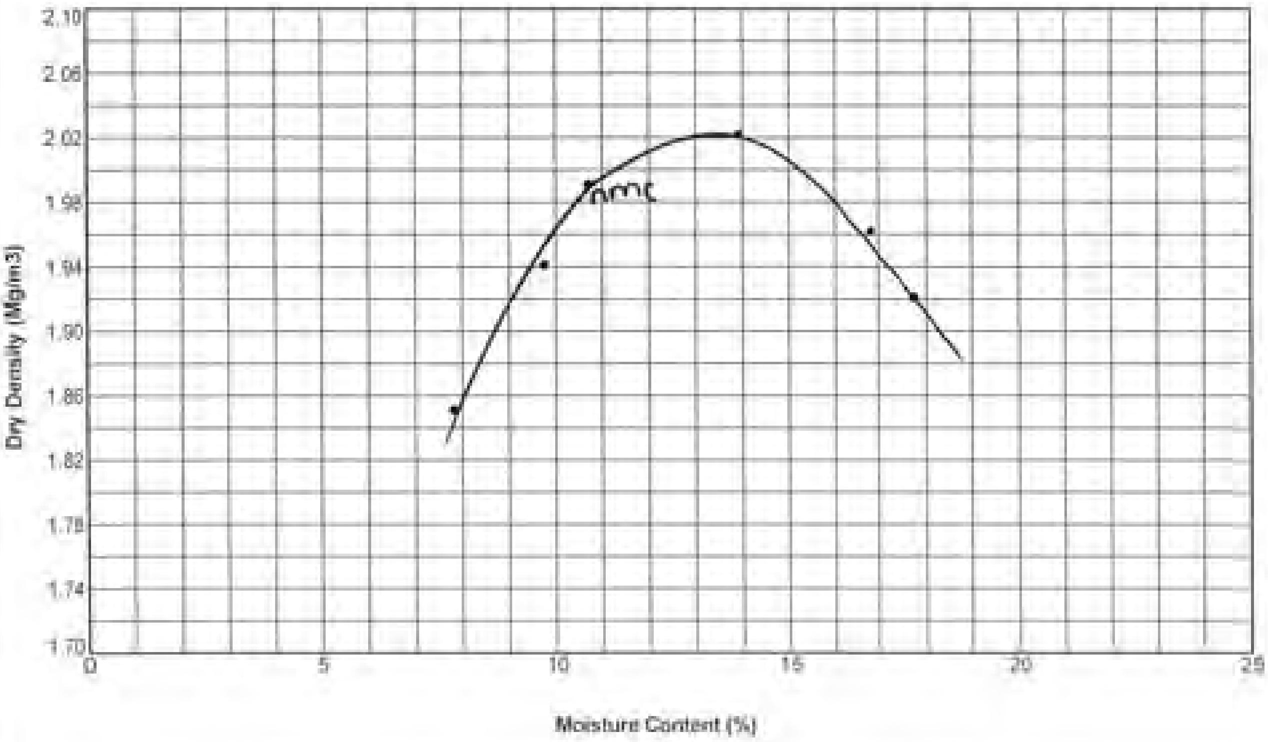
Test Results

Optimum Moisture Content (%) = **14.0** Particle Density (Assumed) = **2.95**

Maximum Dry Density (Mg/m3) = **2.02** Retained on 20mm Sieve (%) = **9.0**

Date Tested = **20/07/2020** Retained on 37.5mm Sieve (%) = **0.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-	Client :-
Metal Processing Area Shallow Soils Investigation	South Tees Development Corporation

Signed :-	Name :-	Page 1 of 1
Date of issue :- 05/11/2020	Certificate No :- COMP/4291/1	AEG Contract No :- 4291

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990 (Test deviated from standard due to excessive coarse material)

Specimen Identification

Exploratory Hole No :- **Stockpile** Depth (m) :- **0.00** Sample Type & No :- **B1**

Test Method 2.5kg Compaction Separate Samples

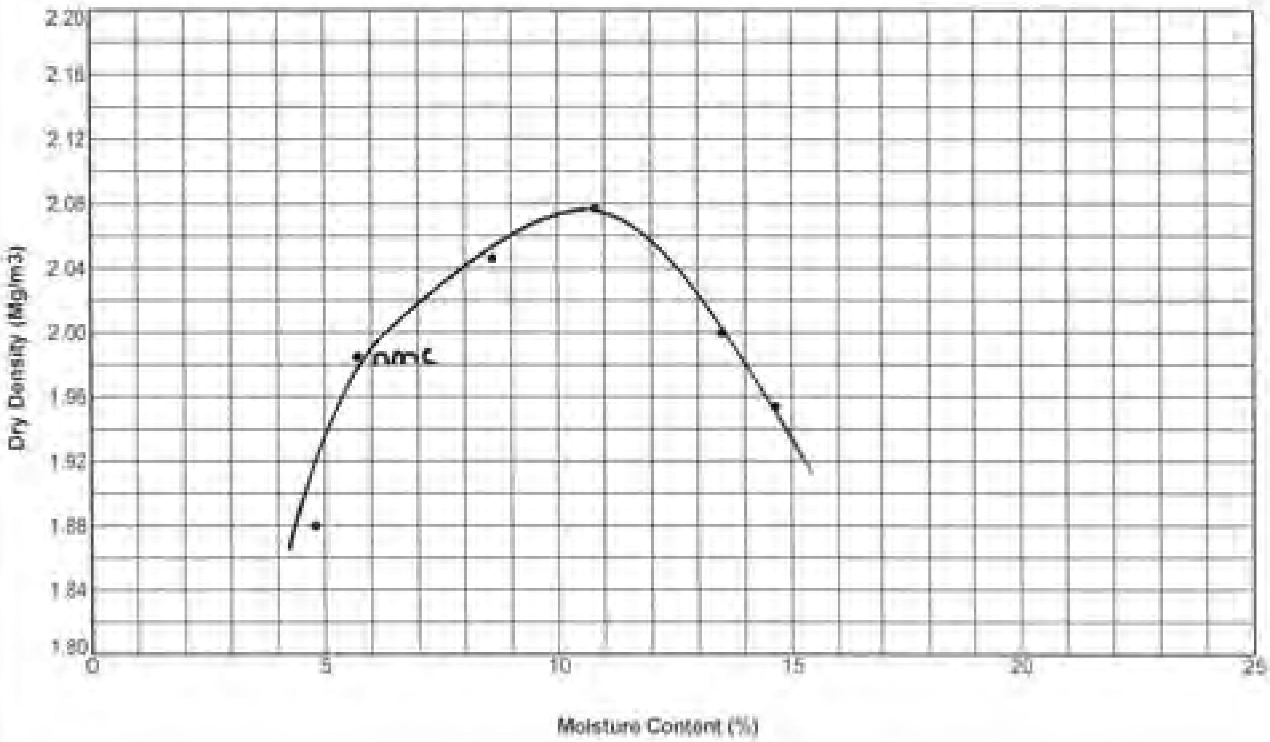
Test Results

Optimum Moisture Content (%) = **10.8** Particle Density (Assumed) = **2.75**

Maximum Dry Density (Mg/m3) = **2.08** Retained on 20mm Sieve (%) = **7.0**

Date Tested = **15/07/2020** Retained on 37.5mm Sieve (%) = **0.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation	Client :- South Tees Development Corporation

Signed :-	Name :-	Page 1 of 1
Date of issue :- 05/11/2020	Certificate No :- COMP/4291/1	AEG Contract No :- 4291

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office [illegible] Regional Office [illegible]

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990 (Test deviated from standard due to excessive coarse material)

Specimen Identification

Exploratory Hole No :- **Stockpile** Depth (m) :- **0.00** Sample Type & No :- **B2**

Test Method 2.5kg Compaction Separate Samples

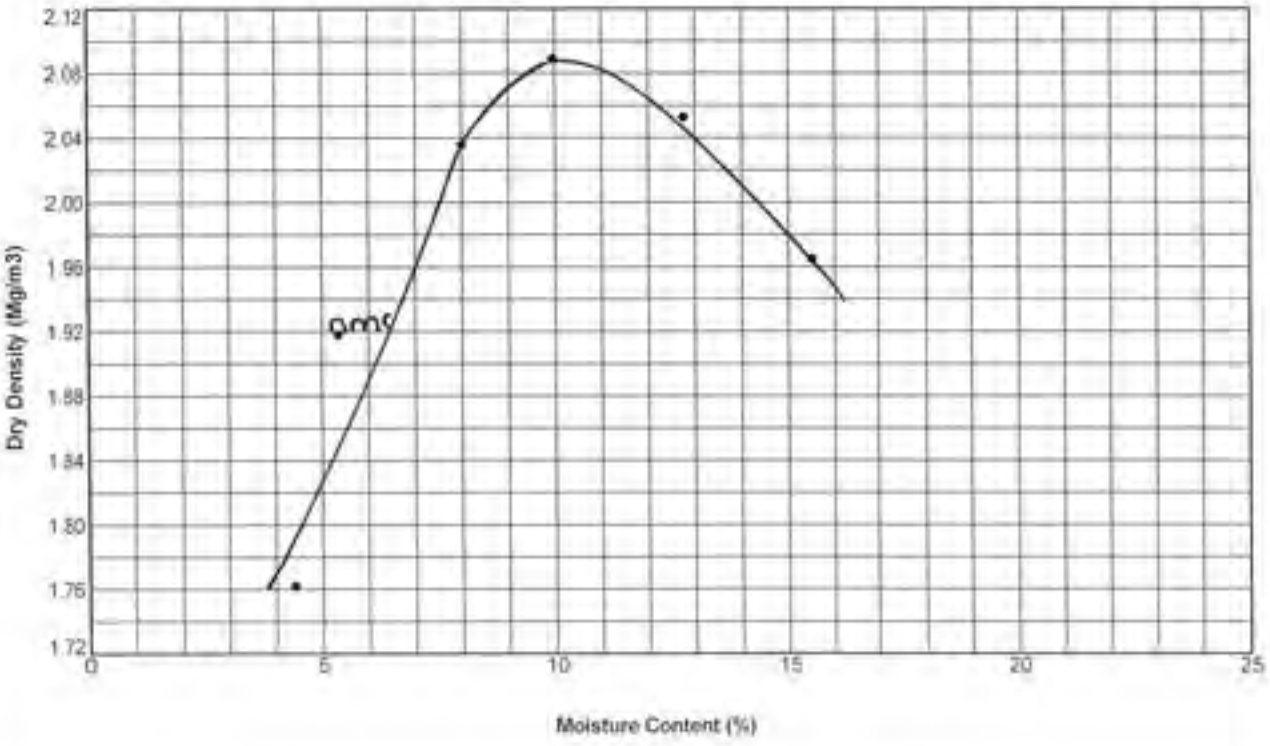
Test Results

Optimum Moisture Content (%) = **10.0** Particle Density (Measured) = **2.71**

Maximum Dry Density (Mg/m3) = **2.09** Retained on 20mm Sieve (%) = **16.0**

Date Tested = **16/07/2020** Retained on 37.5mm Sieve (%) = **3.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-	Client :-
Metal Processing Area Shallow Soils Investigation	South Tees Development Corporation

Signed :-	Name :-		Page 1 of 1
Date of issue :- 05/11/2020	Certificate No :- COMP/4291/1	AEG Contract No. :- 4291	UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990 (Test deviated from standard due to excessive coarse material)

Specimen Identification

Exploratory Hole No :- **Stockpile** Depth (m) :- **0.00** Sample Type & No :- **B3**

Test Method 2.5kg Compaction Separate Samples

Test Results

Optimum Moisture Content (%) = **10.0**

Particle Density (Assumed) = **2.75**

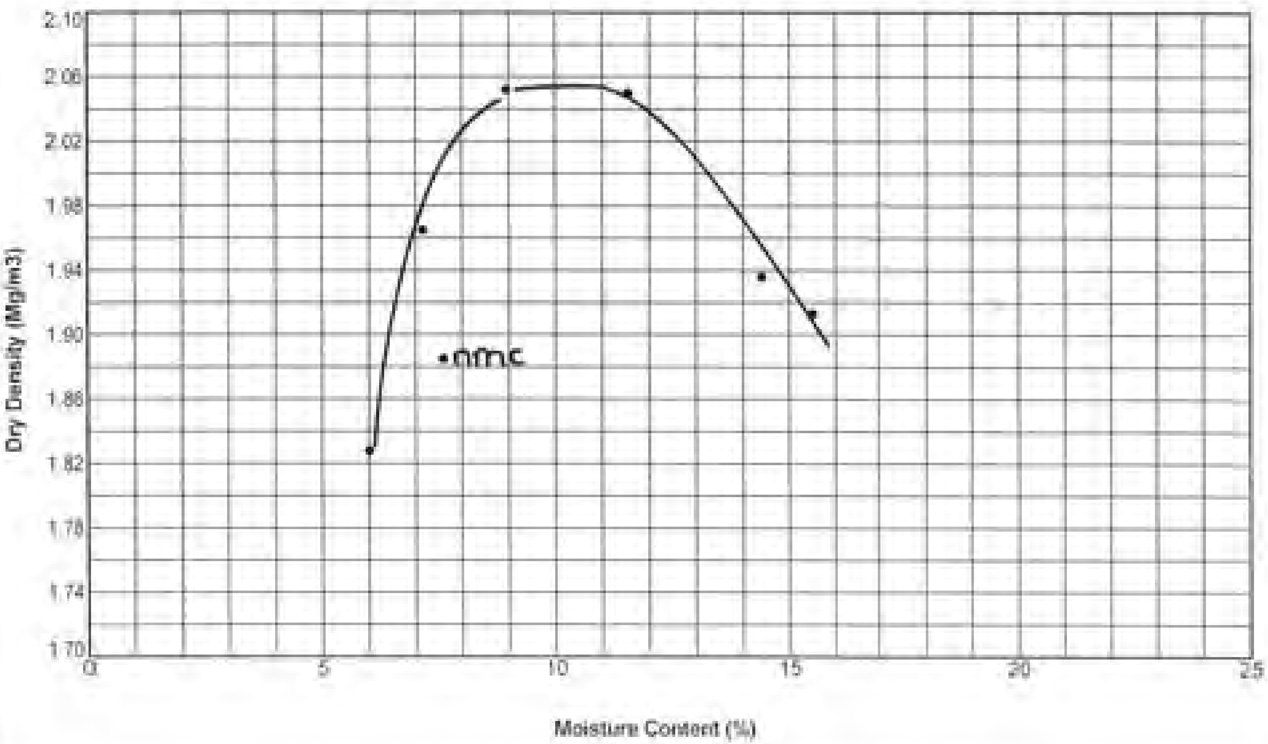
Maximum Dry Density (Mg/m3) = **2.06**

Retained on 20mm Sieve (%) = **14.0**

Date Tested = **17/07/2020**

Retained on 37.5mm Sieve (%) = **5.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation	Client :- South Tees Development Corporation

Signed :- msml	Name :-	Page 1 of 1
Date of issue :- 05/11/2020	Certificate No :- COMP/4291/1	AEG Contract No :- 4291

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **Stockpile** Depth (m) :- **0.00** Sample Type & No :- **B4**

Test Method 2.5kg Compaction Separate Samples

Test Results

Optimum Moisture Content (%) = **11.2**

Particle Density (Assumed) = **2.80**

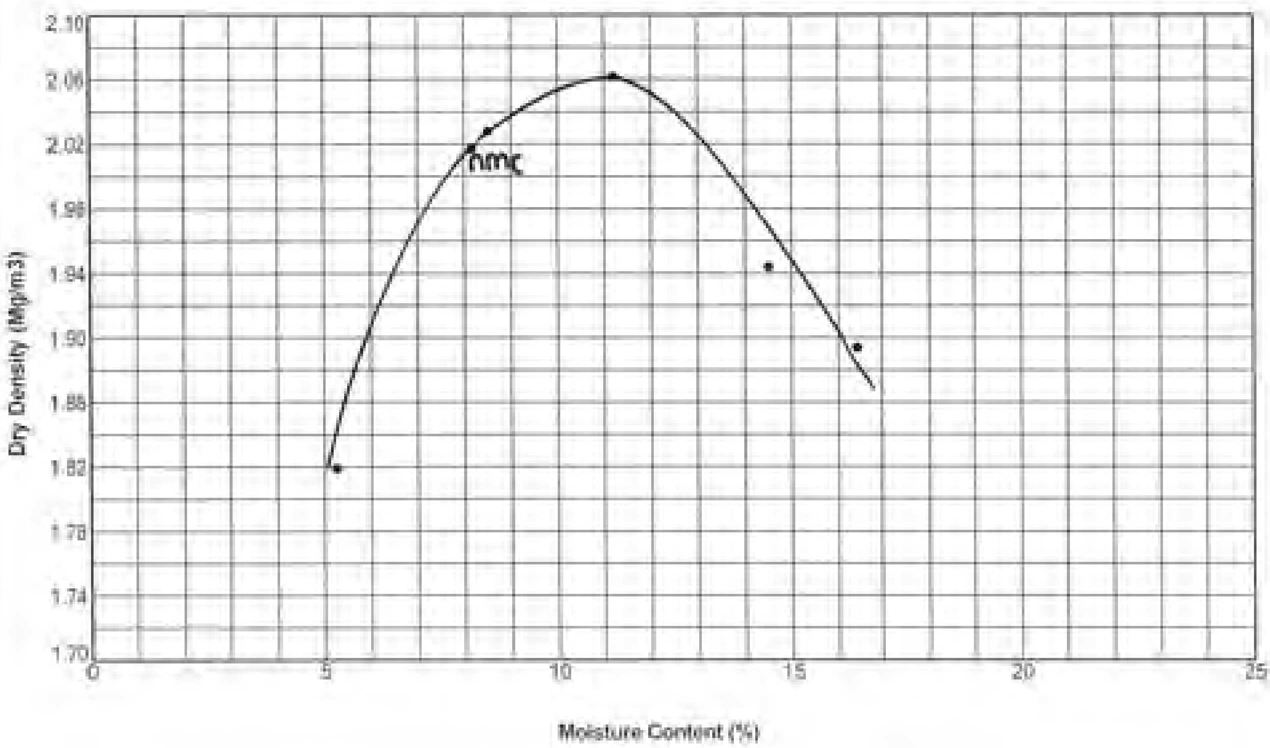
Maximum Dry Density (Mg/m3) = **2.06**

Retained on 20mm Sieve (%) = **7.0**

Date Tested = **17/07/2020**

Retained on 37.5mm Sieve (%) = **1.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation	Client :- South Tees Development Corporation

Signed :- msmp	Name :-	Page 1 of 1
Date of Issue :- 05/11/2020	Certificate No :- COMR/4291/1	AEG Contract No :- **4291**

UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **Stockpile** Depth (m) :- **0.00** Sample Type & No :- **B5**

Test Method 2.5kg Compaction Separate Samples

Test Results

Optimum Moisture Content (%) = **11.0**

Particle Density (Assumed) = **2.80**

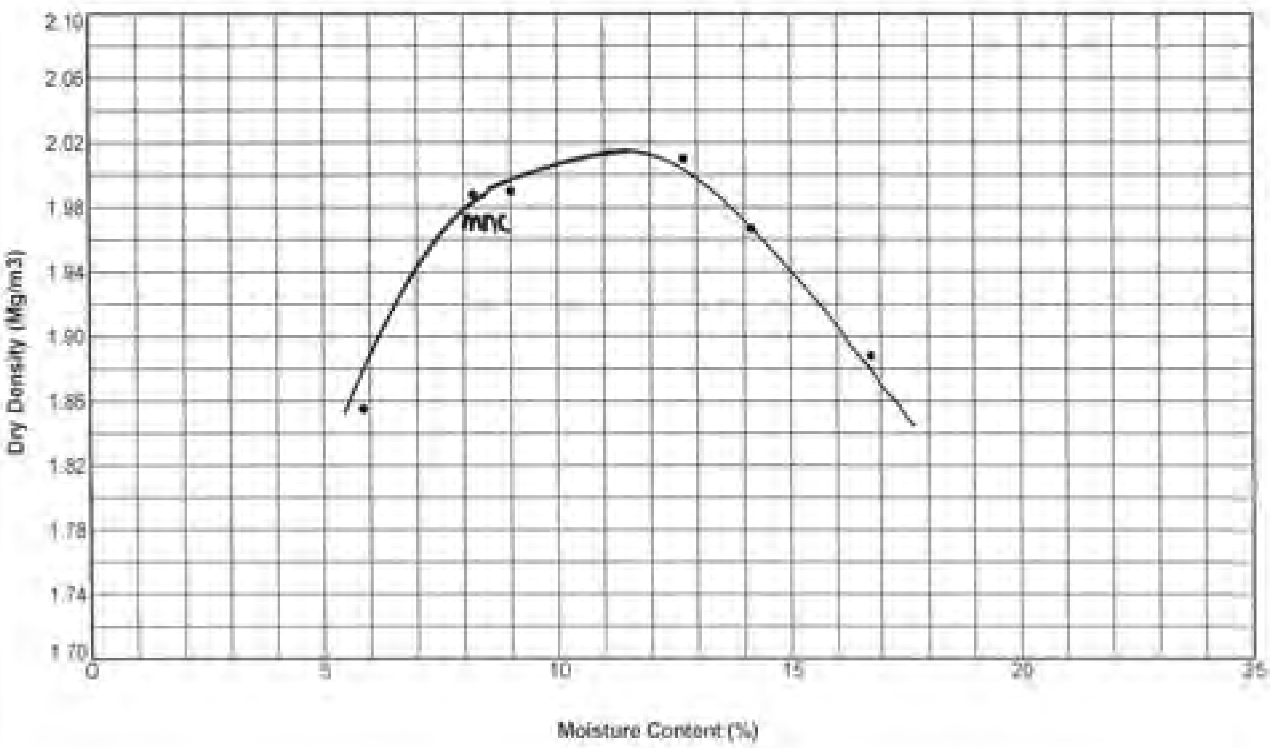
Maximum Dry Density (Mg/m3) = **2.01**

Retained on 20mm Sieve (%) = **10.0**

Date Tested = **17/07/2020**

Retained on 37.5mm Sieve (%) = **3.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Metal Processing Area Shallow Soils Investigation**

Client :- **South Tees Development Corporation**

Signed :- msmq

Name :-

Page 1 of 1

Date of issue :- 05/11/2020

Certificate No :- COMP/4291/1

AEG Contract No. :- **4291**

UKAS TESTING 1367

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **Stockpile** Depth (m) :- **0.00** Sample Type & No :- **B6**

Test Method 2.5kg Compaction Separate Samples

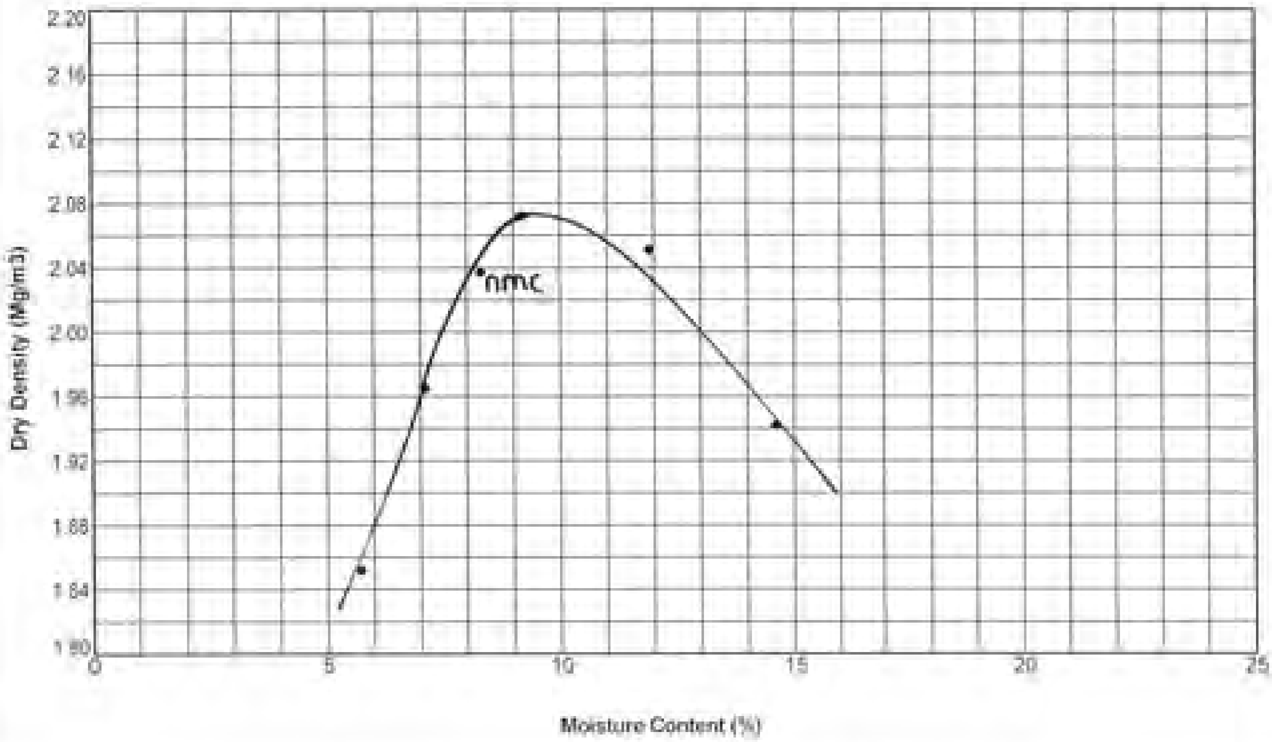
Test Results

Optimum Moisture Content (%) = **9.2** Particle Density (Assumed) = **2.75**

Maximum Dry Density (Mg/m3) = **2.07** Retained on 20mm Sieve (%) = **11.0**

Date Tested = **17/07/2020** Retained on 37.5mm Sieve (%) = **3.0**

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation	Client :- South Tees Development Corporation

Signed :-	Name :-	Page 1 of 1	
Date of Issue :- 05/11/2020	Certificate No :- COMP/4291-1	AEG Contract No :- 4291	UKAS TESTING 1367

ALLIED EXPLORATION & GEOTECHNICS LIMITED

ATTEMPTED AND ABORTED TESTING

Exploratory Hole No.	Sample Depth (m)	Sample ID	Test Type	Retained on 20mm (%)	Retained on 37.5mm (%)	Remarks
MPA_AUK_TP101	2.40	LB6	4.5kg Compaction	99.0	99.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP103	2.30	LB6	4.5kg Compaction	99.0	99.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP104	2.40	LB6	4.5kg Compaction	99.0	99.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP105	2.80	LB6	4.5kg Compaction	96.0	95.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP108	0.80	B2	4.5kg Compaction	98.0	97.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP109	2.00	LB6	4.5kg Compaction	99.0	99.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP110	2.90	B8	4.5kg Compaction	43.0	21.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP112	0.70	B2	4.5kg Compaction	51.0	37.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP112	2.10	LB6	4.5kg Compaction	95.0	91.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP113	2.30	LB6	4.5kg Compaction	33.0	13.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP114	2.50	LB6	4.5kg Compaction	99.0	99.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP117	2.00	LB6	4.5kg Compaction	99.0	98.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP118	3.00	LB8	4.5kg Compaction	100.0	99.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP121	2.50	LB6	4.5kg Compaction	99.0	99.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP123	1.70	B5	4.5kg Compaction	99.0	99.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP125	2.40	LB6	4.5kg Compaction	98.0	98.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP127	0.60	B2	4.5kg Compaction	44.0	12.0	Test Unsuitable due to excessive coarse material
MPA_AUK_TP130	0.30	B2	4.5kg Compaction	81.0	69.0	Test Unsuitable due to excessive coarse material

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation

Client :- South Tees Development Corporation

Signed :-

Name :-

Date of issue :- 05/11/2020

Certificate No :- USCP/4291/1

AEG Contract No :- 4291

1367

LABORATORY TESTING ENCLOSURE 7

Determination of California Bearing Ratio

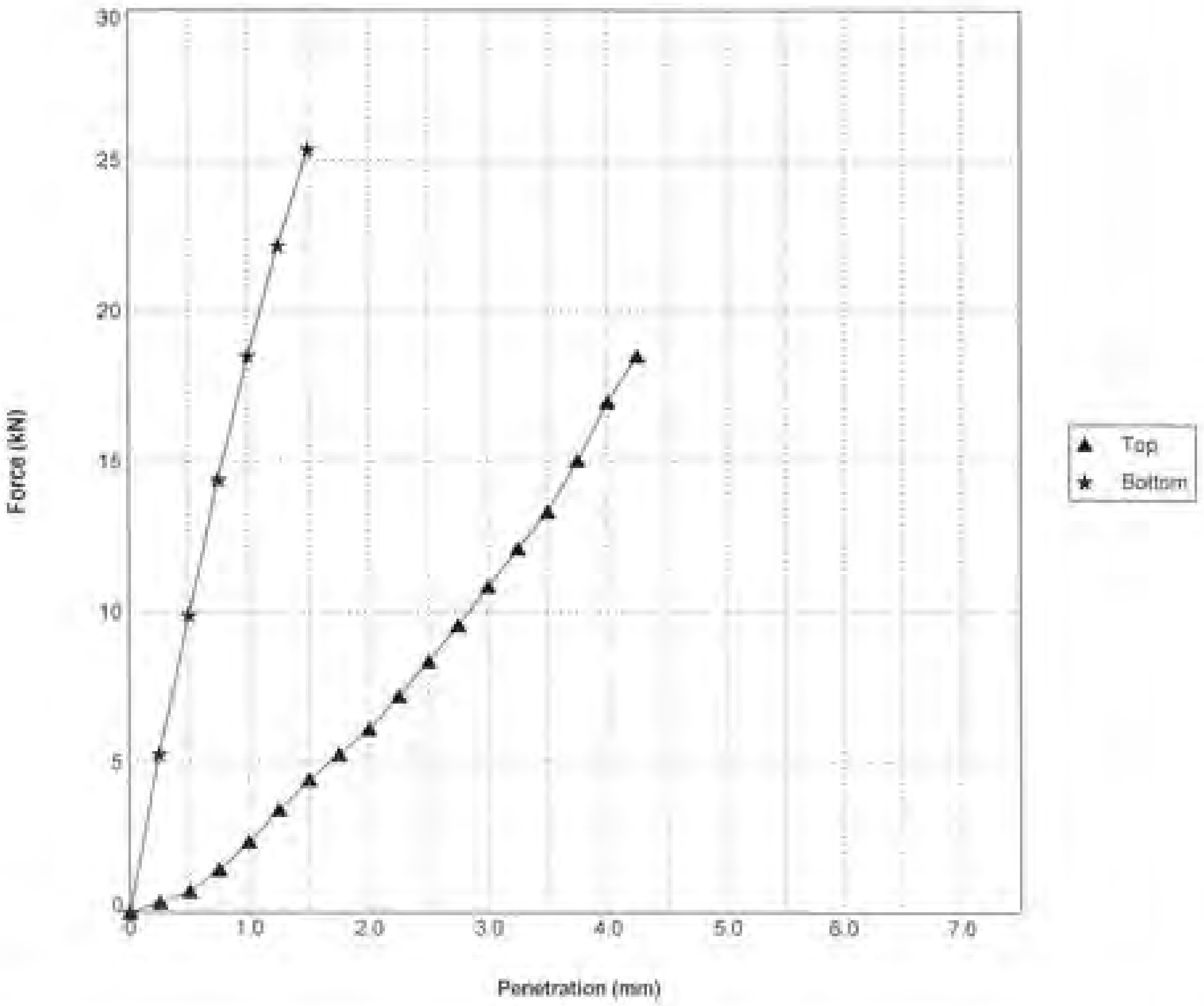
ALLIED EXPLORATION & GEOTECHNICS LIMITED

DETERMINATION OF THE CALIFORNIA BEARING RATIO

BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- **MPA_AUK_TP115** Sample No.- **B2** Depth (m)- **0.50**

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	21.0	Seating Load (N) :	Top 250 / Bottom 250
Correction Needed :	No	Test Moisture Content (%) :	Top 7.8 / Bottom 9.8
Soaking Time (Days) :	N/A	Bulk Density (Mg/m^3) :	2.80
Swelling (mm) :	N/A	Dry Density (Mg/m^3) :	2.58
Date Tested :	18/09/2020	CBR Value (%) :	Top 97 / Bottom
Preparation Method :	4.5kg Compaction		
Remarks :	Test was stopped due to maximum load ring capacity being reached		



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation	Client :- South Tees Development Corporation

Signed :- msene	Name :-	Page 1 of 1	
Date of Issue :- 05/11/2020	Certificate No :- CBR/4291/MPA_AUK_TP115/B2/0.50/1	AEG Contract No. :- 4291	UKAS TESTING 1367

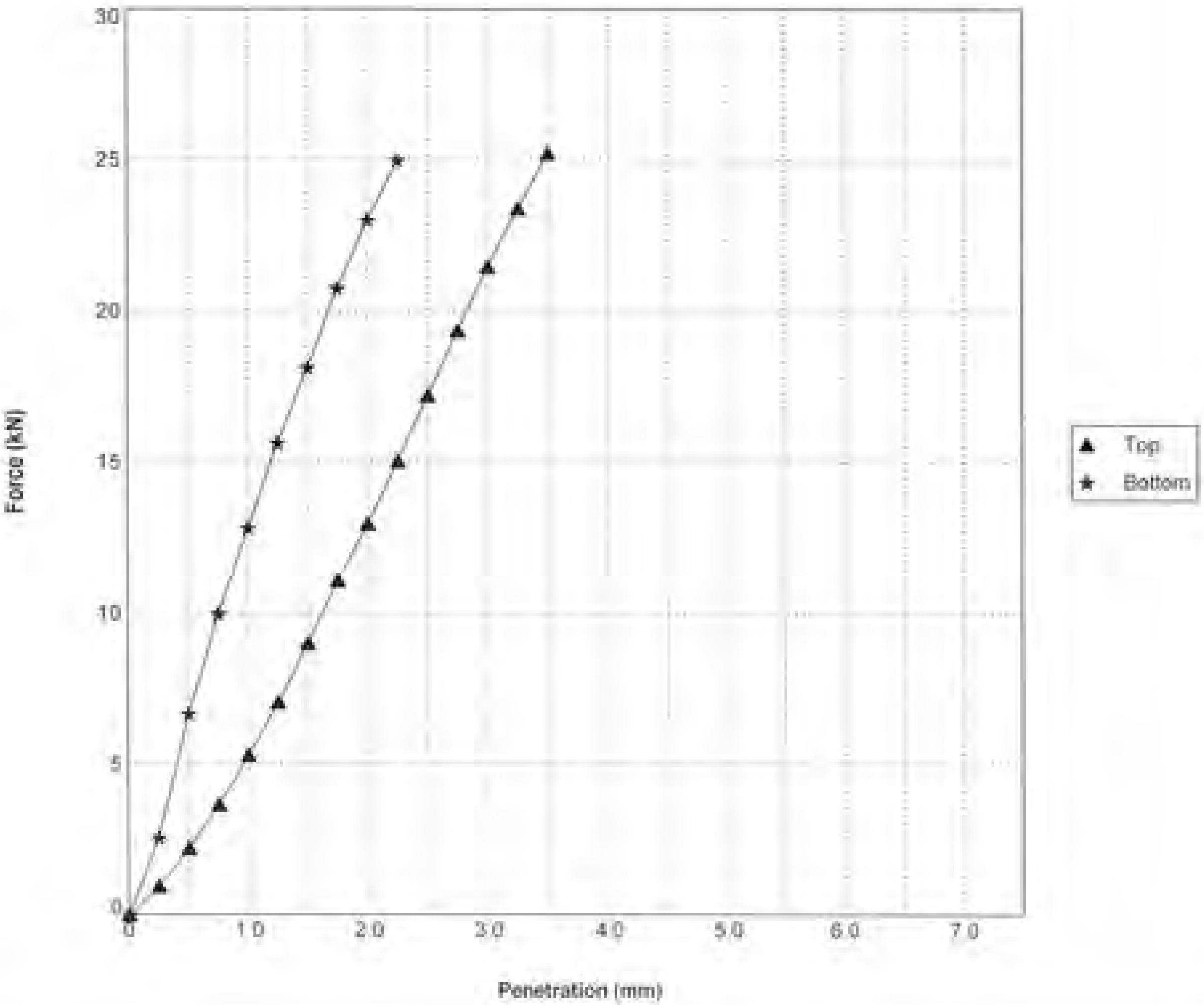
ALLIED EXPLORATION & GEOTECHNICS LIMITED

DETERMINATION OF THE CALIFORNIA BEARING RATIO

Not to BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- **MPA_AUK_TP118** Sample No.- **B2** Depth (m)- **0.60**

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	35.0	Seating Load (N) :	Top 250 / Bottom 250
Correction Needed :	No	Test Moisture Content (%) :	Top 9.1 / Bottom 9.2
Soaking Time (Days) :	N/A	Bulk Density (Mg/m^3) :	2.41
Swelling (mm) :	N/A	Dry Density (Mg/m^3) :	2.21
Date Tested :	23/09/2020	CBR Value (%) :	Top 130 / Bottom 200
Preparation Method :	4.5kg Compaction		
Remarks :	Test was stopped due to maximum load ring capacity being reached.		



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Metal Processing Area Shallow Soils Investigation**	Client :- **South Tees Development Corporation**

Signed :-	Name :-	Page 1 of 1	
Date of Issue :- 05/11/2020	Certificate No :- CBR/4291/MPA_AUK_TP118/B2/0.60/1	AEG Contract No. :- 4291	1367

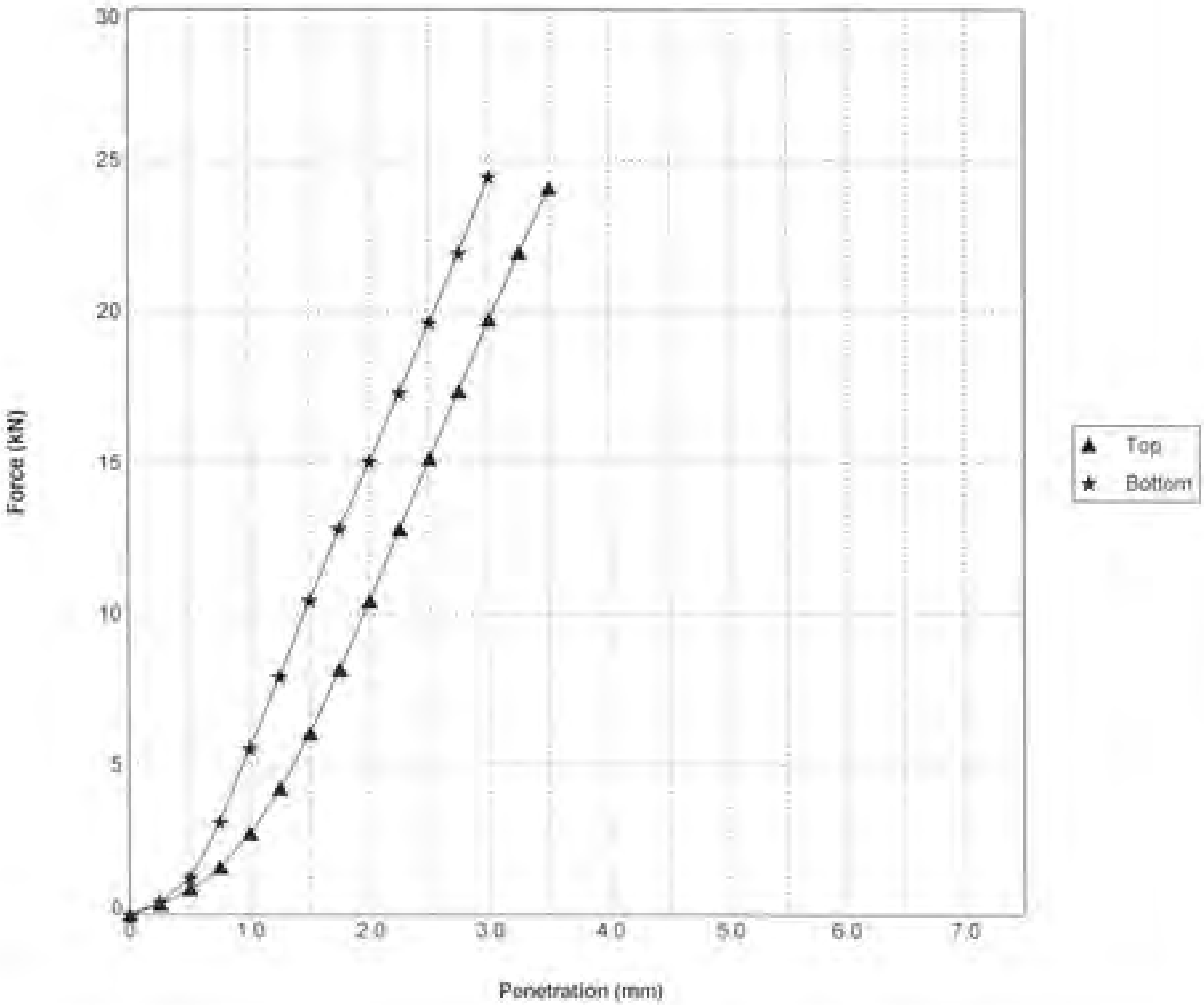
ALLIED EXPLORATION & GEOTECHNICS LIMITED

DETERMINATION OF THE CALIFORNIA BEARING RATIO

BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- **MPA_AUK_TP119** Sample No.- **B2** Depth (m)- **0.80**

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	29.0	Seating Load (N) :	Top 250 / Bottom 250
Correction Needed :	No	Test Moisture Content (%) :	Top 11 / Bottom 10
Soaking Time (Days) :	N/A	Bulk Density (Mg/m^3) :	2.34
Swelling (mm) :	N/A	Dry Density (Mg/m^3) :	2.12
Date Tested :	22/09/2020	CBR Value (%) :	Top 110 / Bottom 150
Preparation Method :	4.5kg Compaction		
Remarks :	Test was stopped due to maximum load ring capacity being reached		



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation	Client :- South Tees Development Corporation

Signed :-	Name :-	Page 1 of 1
Date of issue :- 05/11/2020	Certificate No :- CBR/4291/MPA_AUK_TP119/B2/0.80/1	AEG Contract No. :- 4291

1367

LABORATORY TESTING ENCLOSURE 8

Determination of Permeability in a Triaxial Cell

Certificate No: 4291 BOS1 B | Sheet 1 of 1

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell
Chester-le-Street , Co Durham DH2 2RG
a UKAS TESTING Laboratory No 1367

DETERMINATION OF PERMEABILITY IN TRIAXIAL CELL

SITE: Metal Processing Area Shallow Soils Investigation **JOB No:** 4291

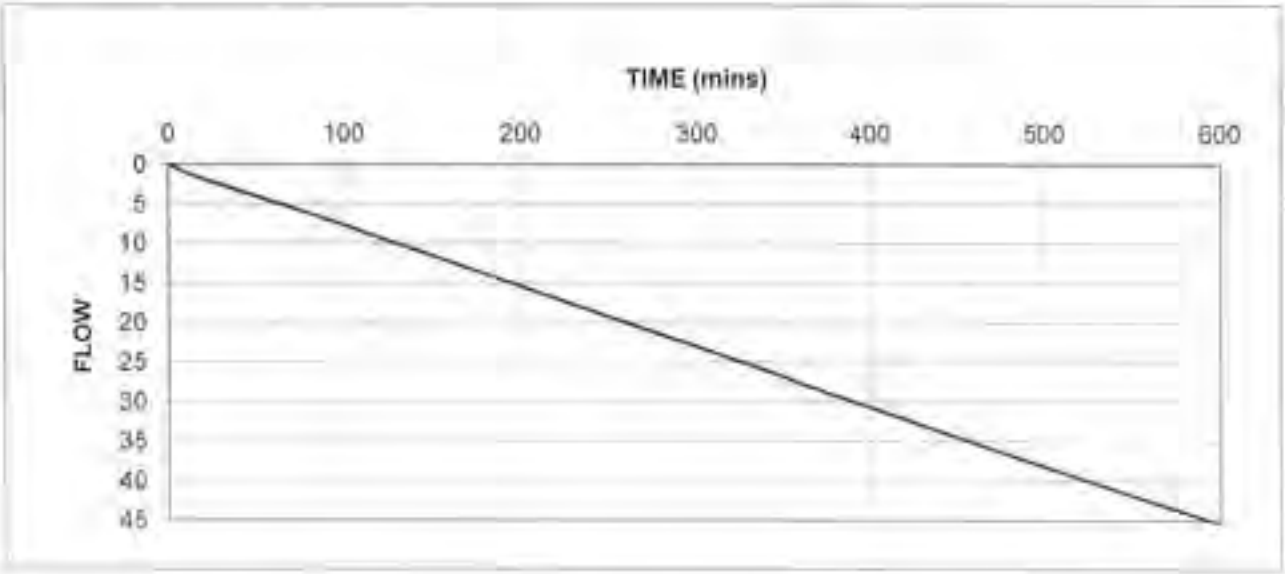
CLIENT: South Tees Development Corporation **Type of specimen:** Remoulded @ NMC +4% (2.5kg rammer)

Sample No: BOS1 B **Depth:** 0.00 **Specific Depth:** n/a

For sample description please refer to sample description sheet.

SPECIMEN DETAILS:		INITIAL	FINAL
Length	mm	145.8	147.5
Diameter	mm	104.6	105.0
Moisture Content	%	15.3	17.4
Wet Density	Mg/m^3	2.10	2.13
Dry Density	Mg/m^3	1.82	1.81
DEGREE OF SATURATION:	%		99.9

PERMEABILITY :		
Cell Pressure	kPa	350
Top Back Pressure	kPa	300
Base Back Pressure	kPa	330
Mean Effective Stress	kPa	35
Mean Flow Rate	ml/min	0.075750
Permeability	m/sec	6.98xE-09



DATE TESTED: 13/08/2020 **DATE OF ISSUE:** 10/09/2020

APPROVED BY: **NAME:** M Selkirk

Certificate No: 4291 Stockpile B2 | Sheet 1 of 1

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell
Chester-le-Street , Co Durham DH2 2RG
a UKAS TESTING Laboratory No.1367

DETERMINATION OF PERMEABILITY IN TRIAXIAL CELL

SITE: Metal Processing Area Shallow Soils Investigation **JOB No:** 4291

CLIENT: South Tees Development Corporation **Type of specimen:** Remoulded @ NMC +3% (2.5kg rammer)

Sample No: Stockpile B2 **Depth:** 0.00 **Specific Depth:** n/a

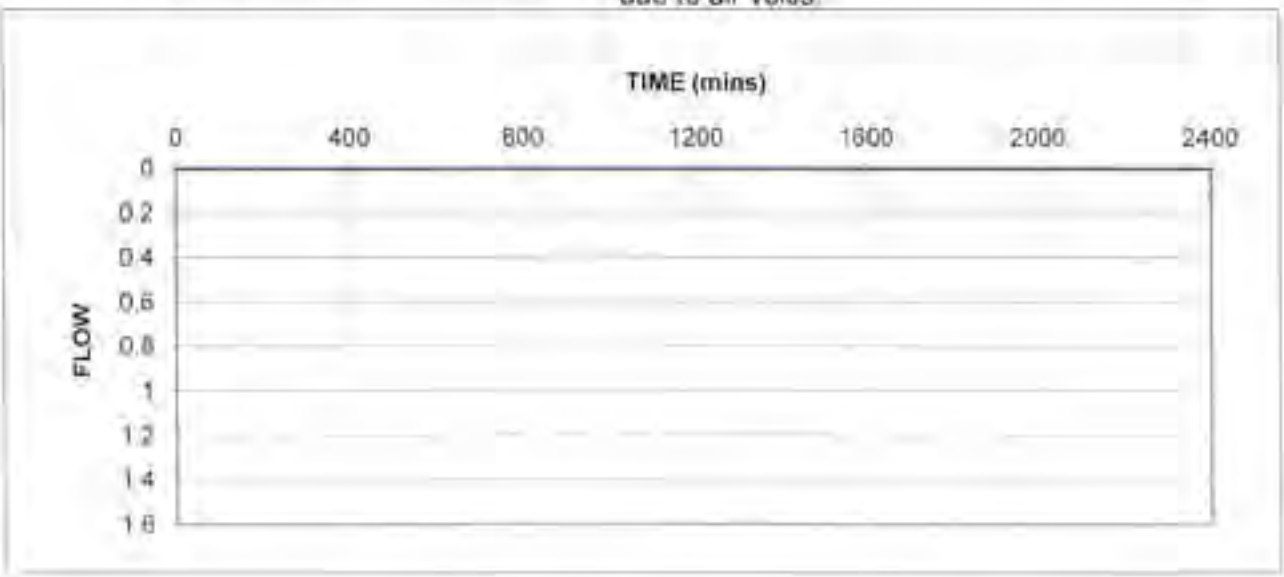
For sample description please refer to sample description sheet.

SPECIMEN DETAILS:		INITIAL	FINAL
Length	mm	137.5	138.1
Diameter	mm	103.8	103.5
Moisture Content	%	8.5	10.1
Wet Density	Mg/m^3	2.27	2.30
Dry Density	Mg/m^3	2.10	2.09
DEGREE OF SATURATION:	%		100.0

PERMEABILITY :

Cell Pressure	kPa	350
Top Back Pressure	kPa	300
Base Back Pressure	kPa	330
Mean Effective Stress	kPa	35
Mean Flow Rate	ml/min	N/A
Permeability	m/sec	N/A

Remarks: Unable to complete test. Water flow through sample was too rapid; probably due to air voids.



DATE TESTED: 24/07/2020 **DATE OF ISSUE:** 29/07/2020

APPROVED BY: **NAME:** M Selkirk

Certificate No: 4291 Stockpile B3 | Sheet 1 of 1

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell
Chester-le-Street , Co Durham DH2 2RG
a UKAS TESTING Laboratory No.1367

DETERMINATION OF PERMEABILITY IN TRIAXIAL CELL

SITE: Metal Processing Area Shallow Soils Investigation **JOB No:** 4291

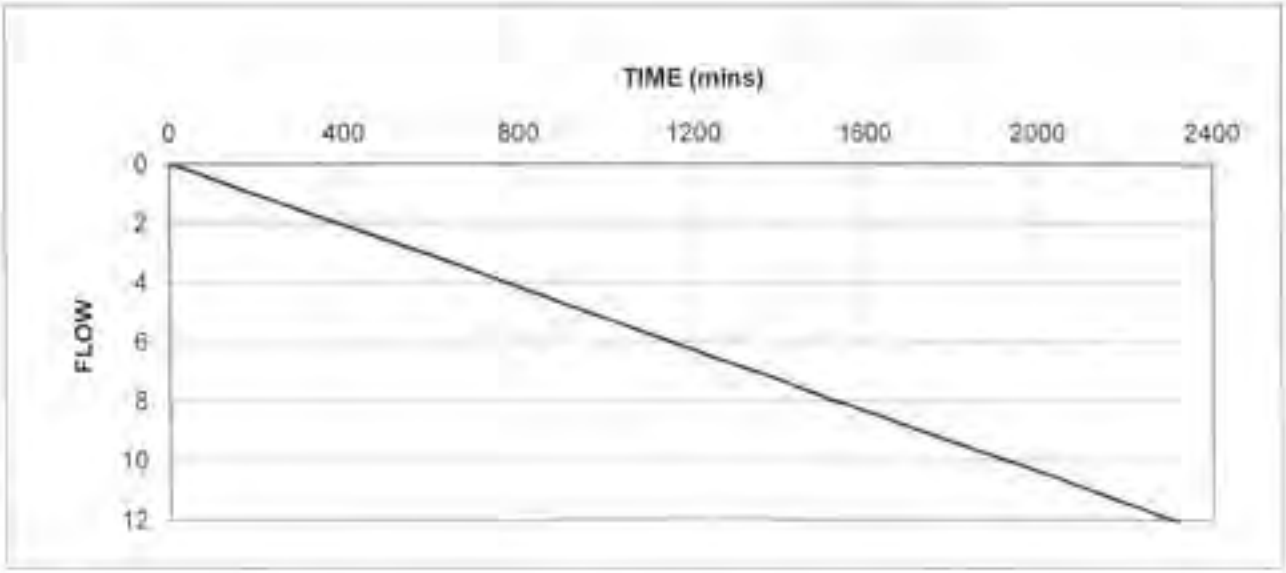
CLIENT: South Tees Development Corporation **Type of specimen:** Remoulded @ NMC +5% (2.5kg rammer)

Sample No: Stockpile B3 **Depth:** 0.00 **Specific Depth:** n/a

For sample description please refer to sample description sheet.

SPECIMEN DETAILS:		INITIAL	FINAL
Length	mm	135.0	134.7
Diameter	mm	104.8	104.1
Moisture Content	%	12.9	13.9
Wet Density	Mg/m^3	2.17	2.21
Dry Density	Mg/m^3	1.92	1.94
DEGREE OF SATURATION:	%		99.9

PERMEABILITY :		
Cell Pressure	kPa	350
Top Back Pressure	kPa	300
Base Back Pressure	kPa	330
Mean Effective Stress	kPa	35
Mean Flow Rate	ml/min	0.005217
Permeability	m/sec	4.44xE-10



DATE TESTED: 24/07/2020 **DATE OF ISSUE:** 29/07/2020

APPROVED BY: **NAME:** M Selkirk

Certificate No: 4291 Stockpile B4 | Sheet 1 of 1

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell
Chester-le-Street , Co Durham DH2 2RG
a UKAS TESTING Laboratory No 1367

DETERMINATION OF PERMEABILITY IN TRIAXIAL CELL

SITE: Metal Processing Area Shallow Soils Investigation **JOB No:** 4291

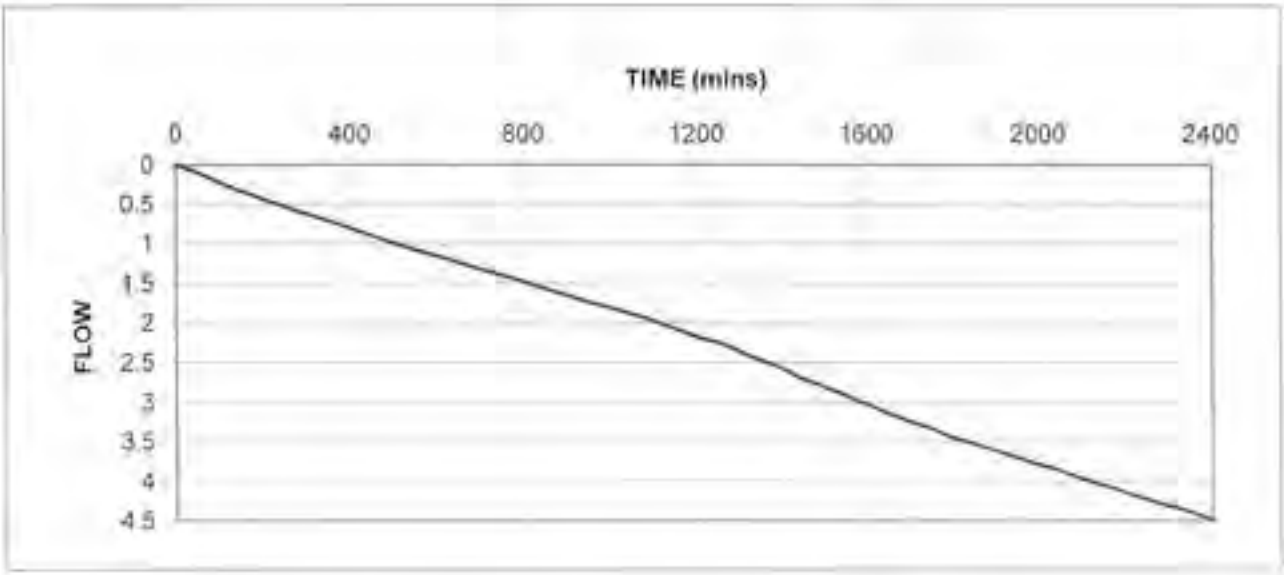
CLIENT: South Tees Development Corporation **Type of specimen:** Remoulded @ NMC +4% (2.5kg rammer)

Sample No: Stockpile B4 **Depth:** 0.00 **Specific Depth:** n/a

For sample description please refer to sample description sheet

SPECIMEN DETAILS:		INITIAL	FINAL
Length	mm	149.0	147.6
Diameter	mm	105.9	104.8
Moisture Content	%	12.7	12.2
Wet Density	Mg/m^3	2.19	2.25
Dry Density	Mg/m^3	1.94	2.00
DEGREE OF SATURATION:	%		100.0

PERMEABILITY :		
Cell Pressure	kPa	350
Top Back Pressure	kPa	300
Base Back Pressure	kPa	330
Mean Effective Stress	kPa	35
Mean Flow Rate	ml/min	0.001871
Permeability	m/sec	1.72xE-10



DATE TESTED: 07/08/2020 **DATE OF ISSUE:** 18/08/2020

APPROVED BY: **NAME:** M Selkirk

Certificate No: 4291 Stockpile B6 | Sheet 1 of 1

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell
Chester-le-Street , Co Durham DH2 2RG
a UKAS TESTING Laboratory No 1367

DETERMINATION OF PERMEABILITY IN TRIAXIAL CELL

SITE: Metal Processing Area Shallow Soils Investigation **JOB No:** 4291

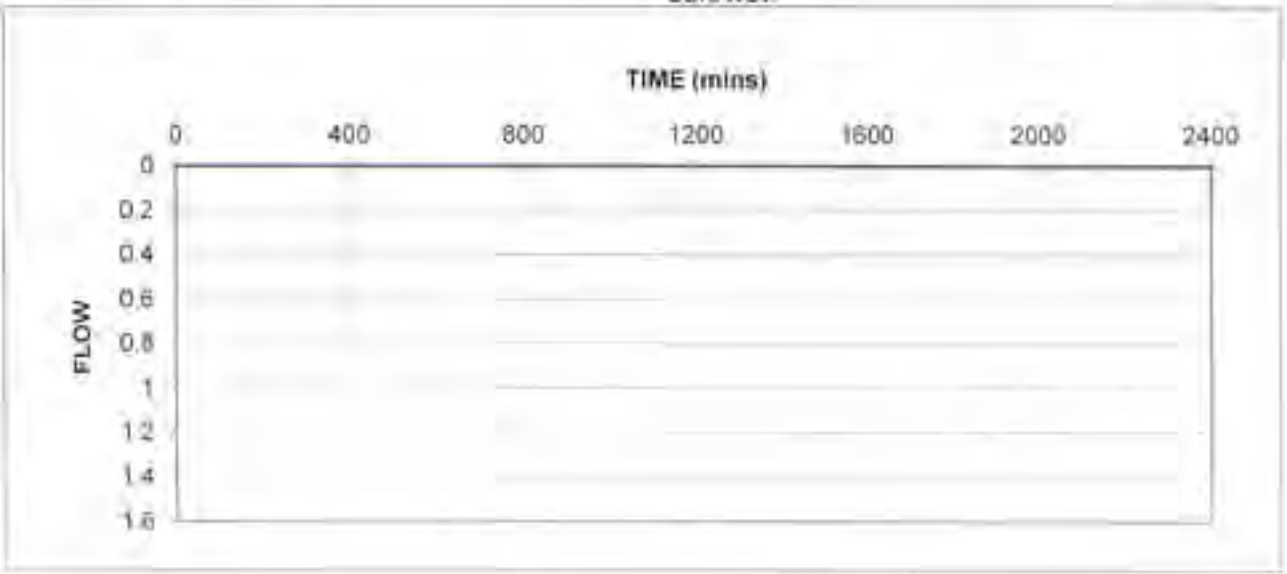
CLIENT: South Tees Development Corporation **Type of specimen:** Remoulded @ NMC +6% (2.5kg rammer)

Sample No: Stockpile B6 **Depth:** 0.00 **Specific Depth:** n/a

For sample description please refer to sample description sheet.

SPECIMEN DETAILS:		INITIAL	FINAL
Length	mm	160.0	
Diameter	mm	105.0	
Moisture Content	%	14.5	
Wet Density	Mg/m^3	2.30	
Dry Density	Mg/m^3	2.01	
DEGREE OF SATURATION:	%		N/A
PERMEABILITY :			
Cell Pressure	kPa	350	
Top Back Pressure	kPa	300	
Base Back Pressure	kPa	330	
Mean Effective Stress	kPa	35	
Mean Flow Rate	ml/min	N/A	
Permeability	m/sec	N/A	

Remarks: Sample unable to hold itself up sufficiently for test to be completed - too soft/wet.



DATE TESTED: 07/08/2020 **DATE OF ISSUE:** 18/08/2020

APPROVED BY: **NAME:** M.Selkirk

LABORATORY TESTING ENCLOSURE 9

Determination of *In-situ* Density Core Cutter

ALLIED EXPLORATION & GEOTECHNICS LIMITED

IN-SITU DENSITY TEST CORE CUTTER METHOD

BS 1377 : Part 9 : Clause 2.4 : 1990

Exploratory Hole No.:-	Sample Type & No.:-	Sample Depth (m):-	Specific Depth (m):-	Bulk Density (Mg/m^3):-	Dry Density (Mg/m^3):-	Moisture Content (%):-	Date Tested	Test Method
BOS1	B	0.00	0.00	2.20	2.04	8.0	17/07/2020	Undisturbed
Stockpile	C1	0.00	0.00	2.12	1.99	6.6	10/07/2020	Undisturbed
Stockpile	C2	0.00	0.00	2.09	1.99	5.1	10/07/2020	Undisturbed
Stockpile	C4	0.00	0.00	2.17	1.98	9.5	17/07/2020	Undisturbed
Stockpile	C5	0.00	0.00	2.20	2.02	8.5	17/07/2020	Undisturbed
Stockpile	C6	0.00	0.00	2.20	2.06	6.9	17/07/2020	Undisturbed

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Metal Processing Area Shallow Soils Investigation

Client :- South Tees Development Corporation

Signed :-

Name :-

Date of issue :- 05/11/2020

Certificate No :- DENS/4291/1

AEG Contract No :- 4291

UKAS TESTING 1367

LABORATORY TESTING ENCLOSURE 10

Slag Analysis

(Tested Externally)

TRS REPORT

Report Ref: BG0G/AEG/MPR/TRS/10/20/RP2
Date Issued: 11 September 2020
TRS Sample Refs: BG0G05-09
Order No: Job 4291

EXAMINATION OF FIVE SAMPLES

FROM

4291 MPA SITE, REDCAR

FOR

ALLIED EXPLORATION & GEOTECHNICS LTD

Thomas Research Services Ltd.
Tel: +44 (0) 1469 532 929
www.slagtest.co.uk
Unit 7, Tattershall Castle Court, Morgan Way, New Holland,
North Lincolnshire, DN19 7PZ, United Kingdom
A Limited Company registered in England. Company Registration No: 2518421

EXAMINATION OF FIVE SAMPLES
FROM
4291 MPA SITE, REDCAR
FOR
ALLIED EXPLORATION & GEOTECHNICS LTD

1. BACKGROUND

Five bulk samples were received from the above site on 31st July 2020. Each sample was weighed and allocated a unique TRS reference number, the details of which are recorded below:-

TRS Ref	Site Ref	Depth/m	Mass/kg
BG0G05	TP101 B5	1.9	19.5
BG0G06	TP107 B5	1.5	18.9
BG0G07	TP119 B6	2.0	17.9
BG0G08	TP120 B9	3.8	11.0
BG0G09	TP122 B9	3.8	12.0

There was a delay in processing these samples due to the Coronovirus lockdown.

The purpose of the exercise was to identify the range and relative concentrations of any iron and steelmaking slags present in the samples, and whether there was any potential for volumetric instability from the materials.

2. SAMPLE PREPARATION & PROGRAMME OF ANALYSIS

The samples were primary crushed to reduce particle size down to <50mm, portions then being selected and dried at low temperature to constant weight. The dried material was subjected to a regime of stage crushing and quartering to further reduce particle size down to <5mm. Portions of this <5mm material

were made up into resin bound blocks, one face of which was ground flat and polished using diamond pastes. Further portions of the <5mm material were milled to a fine powder. Fractions of material were extracted throughout the preparation procedure to provide the materials necessary for the further tests and analyses required in the programme.

A petrological examination was made of the polished blocks using reflected light microscopy, the complete findings of which are recorded in appendix A. The results of this examination were discussed in our report of 11th September 2020. On the basis of that report, and after discussions with the client, the following tests and analyses were carried out on the samples:-

Samples BG0G09 was subjected to the following tests & analyses to assess the potential for expansion of the blast furnace slag.

- Water soluble sulphate (table 1)
- Acid soluble sulphate (table 1)
- Total sulphur (table 1)
- Thermal analysis (table 3)
- TRS accelerated expansion test (table 4)

Samples BG0G05 & 07 were subjected to the following tests & analyses to assess the potential for expansion of the basic steel slag.

- Free CaO (table 2)
- Free MgO (table 2)
- Thermal analysis (table 3)
- TRS accelerated expansion test (table 4)

3. DISCUSSION OF RESULTS

3.1 Petrology

A petrological examination was made of the five samples using reflected light microscopy. The complete findings of this examination are recorded in appendix A.

Blast furnace slag was present in all five samples, with substantial quantities present in samples BG0G 06, 08 & 09 and small amounts in samples BG0G 05 & 07. The blast furnace slag was predominantly crystalline with only minor amounts of glassy material seen. Secondary alteration due to weathering was moderate, consisting mainly of pore infill and surface rinds. Products of alteration included calcite and gypsum, with other products being difficult to identify specifically under the microscope. Old weathered blast furnace slag may occasionally contain pockets of potentially expansive material (see appendix B). This potential can only be assessed by direct expansion testing (see sections 3.2-3.5). The unaltered slag consisted predominantly of melilite, along with more minor amounts of spinel, metallic iron and sulphides.

Basic steel slag was present in four of the five samples. Samples BG0G 05 & 07 contained very large amounts, with samples BG0G 08 & 09 containing small amounts. The slag was extensively altered due to weathering, the secondary phases being difficult to identify specifically under the microscope. The unaltered basic steel slag consisted largely of dicalcium silicate, along with more minor amounts of RO & R_3O_4 phase, CaF phase, lime phase and periclase. The mineralogy of the basic steel slag would suggest that it may have significant potential for expansion (see appendix B). This potential can only be assessed by direct expansion testing (see sections 3.3 to 3.5).

A small amount of basic refractory material was seen in sample BG0G 09. This material, even in minor amounts, can have significant potential for expansion (see appendix B).

Other constituents seen in the samples, generally in minor concentrations, included alumino-silicate brick, quartz, iron ore, metal, coal and coke. A cementitious material often bound the smaller particles together. This material appeared similar to the slag alteration products.

3.2 Sulphur Species

The following range of analyses were performed on samples BG0G09 (this sample contained significant amounts of blast furnace slag). The results are recorded in table 1:-

- Water soluble sulphate
- Acid soluble sulphate
- Total sulphur

Total sulphur recorded was 0.77 percent. Acid soluble sulphate was 0.85 percent, with a corresponding water soluble sulphate of 0.57 g/l. These sulphate and sulphur values were fairly typical for blast furnace slag. However, care should be taken when specifying concrete that may come into contact with the slag. Calculations show that 44 percent of the available sulphur is present as sulphate.

3.3 Thermal Analysis

Simultaneous differential thermal analysis (DTA) and thermo-gravimetric analysis (TGA) were performed on samples BG0G05, 07 & 09. The results are recorded in table three.

No ettringite or gypsum was seen in any of the samples.

Calcium hydroxide was recorded in samples BG0G05 & 07 at trace and 0.6 percent. Magnesium hydroxide was measured in the same samples both at trace level. These values were used to correct the free CaO and free MgO analyses recorded in table 2.

Calcite was present in all three samples examined at between 0.2 and 3.4 percent. This product is an indicator as to the weathered state of the slag.

3.4 Free CaO & Free MgO

Free CaO & free MgO analyses were carried out on samples BG0G05 & 07 (These samples contained significant mounts of basic steel slag). The results are recorded in table 2. Both original and corrected values are recorded. The original values include both the oxide **(**CaO and MgO**)** and the hydroxide **(**($Ca(OH)_2$ and $Mg(OH)_2$**)** contents. The corrected values report only the oxide content **(**CaO and MgO**)** after correction using the hydroxide values from the thermal analyses. These corrected values are the more significant, as it is only the oxides that are still free to hydrate, i.e. expand.

Free lime was recorded in the samples at 1.4 and 0.8 percent. Free magnesia was recorded at 0.9 percent. These corrected free lime and free magnesia levels record oxides that are potentially still free to hydrate (i.e. expand).

3.5 TRS Accelerated Expansion Test

The TRS accelerated expansion test was performed on samples BG0G05, 07 & 09. The results are recorded in table four. Note that the test measures potential for future expansion, and is not a measure of expansion that may have taken place in the past.

Sample BG0G09 (consisting predominantly of blast furnace slag, with minor amounts of basic steel slag and basic refractory material) recorded an expansion result of 0.29 percent. The samples containing significant basic steel slag recorded expansion results of 0.76 and 0.90 percent.

4. CONCLUSIONS

The following conclusions can be drawn:-

- Blast furnace slag was a dominant constituent in three of the samples (BG0G 06, 08 & 09) and a minor constituent in the remaining two. The slag was mainly crystalline although minor amounts of glassy material were seen. The slag showed some alteration due to weathering. Old weathered blast furnace slag may occasionally contain pockets of potentially expansive material.
- Further testing of sample BG0G09 consisting predominantly of blast furnace slag (with minor basic steel slag & basic refractory) recorded an expansion result of 0.29 percent. The sulphate values should be taken into consideration when specifying concrete that may come into contact with the slag.
- Basic steel slag was the dominant constituent in samples BG0G 05 and 07. It was also present in small amounts in samples 08 & 09. This material is likely to present a significant risk of expansion.

- Expansion testing of samples (BG0G05 & 07) consisting mainly of basic steel slag recorded expansion results of 0.76 and 0.90 percent.
- Minor amounts of basic refractory material were seen in sample BG0G 09. This product can be a significant source of expansion, even when present in relatively small amounts.
- Other products were seen in the samples in minor amounts including alumino-silicate brick, quartz, iron ore, metal, coal and coke.

Note

These conclusions apply only to the samples tested and may not represent the bulk of the material on the site from which they were taken.

Ian D. Thomas

Ian D Thomas BSc(Hons) **21 October 2020**

TABLE 1 — SULPHUR SPECIES ANALYSES

TRS Ref	Site Ref	Water Sol. SO_3 (g/l)	Acid Sol. SO_3 (%)	Total S (%)
BG0G05	TP101 B5			
BG0G07	TP119 B6	-	-	-
BG0G09	TP122 B9	0.57	0.85	0.77

TABLE 2 — ANALYSIS FOR FREE CaO AND FREE MgO

TRS Ref	Site Ref	Free CaO Original (%)	Free CaO Corrected (%)	Free MgO Original (%)	Free MgO Corrected (%)
BG0G05	TP101 B5	1.4	1.4	0.9	0.9
BG0G07	TP119 B6	1.3	0.9	0.9	0.9
BG0G09	TP122 B9	-	-	-	-

TABLE 3 — RESULTS FROM THERMAL ANALYSIS

TRS Ref	Site Ref	Mass % by Thermal Analysis						
		L.O.I.	Ettringite	Gypsum	Calcite	$Ca(OH)_2$	$Mg(OH)_2$	Others
BG0G05	TP101 B5	1.42	0.0	0.0	1.1	trace	0.0	-
BG0G07	TP119 B6	0.97	0.0	0.6	0.2	0.6	trace	-
BG0G09	TP122 B9	6.44	0.0	0.0	3.4	0.0	trace	-

TABLE 4 — TRS ACCELERATED EXPANSION TEST

TRS Ref	Site Ref	7 day (%)	14 day (%)	21 day (%)	28 day (%)
BG0G05	TP101 B5	0.55	0.69	0.74	0.76
BG0G07	TP119 B6	0.42	0.72	0.83	0.90
BG0G09	TP122 B9	0.17	0.28	0.29	0.29

APPENDIX A

PETROLOGICAL REPORT ON SAMPLES BG0G 05-09

A petrological examination has been carried out of five samples BG0G 05 to 09.

Polished blocks were prepared using particulate material crushed to a nominal size of –5mm. Representative material was made up into resin-bonded blocks. One face of each of these was ground flat and polished using diamond pastes. In addition, the surfaces were selectively etched with water and 0.1%N HCl in order to help with the phase identification.

The detailed results are given in the accompanying Table.

Samples 06, 08 and 09 consist largely of blast furnace slag and its alteration products.

Samples 05 & 07 are mainly basic steel slag. Very little basic refractory material was seen.

Blast furnace slag
The unaltered blast furnace slag consists mainly of crystalline melilite (Ca,Mg,Al silicate). Also, some spinel ($MgAl_2O_4$) occurs as a primary phase. The matrix, the space between the melilite crystals, is partly occupied by silicate glass and partly with other silicates. The slag contains minor amounts of iron metal occurring as tiny globules and prills and, also, dendritic crystals of Ca,Mn sulphide. Secondary alteration is moderate. It is mainly restricted to pore infill and the formation of thin rinds, especially the larnite. The secondary products are mostly finely granular and are difficult to identify specifically under the microscope. Minor amounts of calcite ($CaCO_3$) and well-crystallised gypsum ($CaSO_4.2H_2O$) are present.

Basic steel slag
The unaltered basic steel slag consists mainly of dicalcium silicate, RO and R_3O_4 phases (FeO and Fe_3O_4 with some Al, Mn, Mg and Ca in solid solution) and CaF phases (complex Ca alumino-ferrites). Individual particles vary considerably in composition. Lime phase (CaO with some Fe, Mn and Mg in solid solution) is present in minor amounts. It occurs mainly as granular particles up to about 0.1 mm in size. Peridase (MgO with some Fe in solid solution) is more common. Some metal is present as prills. The slag is extensively altered to secondary products that are difficult to identify specifically and are, probably, mainly hydrated silicates.

Other constituents
These include quartz, iron ore and coke. The particles are bonded together by cementitious material that is similar to the slag alteration products but probably also includes some clay. It consists mostly of complex hydrates difficult to identify under the optical microscope.

TRS SAMPLES BG0G 05-09

	5	6	7	8	9
BLAST FURNACE SLAG					
Amount	***s***	***L***	***s***	***L***	***l***
Phases present:-					
Melilite	l	L	L	L	L
Matrix & other silicates	s	s	s	s	s
Ca sulphide	-	vs	-	vs	vs
Metallic iron	-	s	-	s	vs
Spinel	s	s	-	s	vs
Glassy slag	-	s	-	-	-
Alteration products	s	s	s	m	s
Calcite	-	-	s	-	-
Gypsum	-	-	-	s	-
BASIC STEEL SLAG					
Amount	***L***	***-***	***L***	***s***	***s***
Phases present:-					
Dicalcium silicate	l	-	l	l	m
Tricalcium silicate	s	-	-	-	-
Unetched silicate	-	-	s	-	-
RO phase	m	-	m	m	m
CaF phase	s	-	s	s	s
R3O4 phase	s	-	s	s	-
Metal & rust	s	-	vs	-	vs
Lime phase	vs	-	vs	-	-
Periclase	s	-	s	s	s
Alteration products	m	-	s	l	l
BASIC REFRACTORIES					
Amount	***-***	***-***	***-***	***-***	***s***
OTHER CONSTITUENTS					
Alumino-silicate brick	-	s	-	-	-
Quartz, etc.	s	vs	vs	-	vs
Intermediate slag	s		-	-	-
Metal, rust, scale, etc.	s	-	vs	vs	s
Iron ore, ironstone, etc.	-	-	-	-	vs
Shale, etc.	m	-	-	-	-
Coke	s	-	-	-	vs
Coal & char	-	s	-	-	-
Cementitious alteration products	s	vs	s	s	s

L = very large, l = large, m = medium, s = small and vs = very small amounts

GENERAL EXPLANATION

L = very large, l = large, m = medium, s = small and vs = very small amounts.

Blast furnace slag. When present this consists mainly of melilite (Ca,Mg,Al silicate ranging in composition between $Ca_2Al_2SiO_7$ and $Ca_2MgSi_2O_7$). Other common phases are merwinite ($Ca_3MgSi_2O_8$). The matrix often consists of some of the above phases, especially melilite, but may also contain other phases such as wollastonite ($CaSiO_3$), anorthite ($CaAl_2Si_2O_8$) and pyroxene ($(CaMg)SiO_3$). Spinel ($MgAl_2O_4$) may be present. Sulphides and metal usually occur and are mostly finely dispersed, but the metal sometimes occurs as prills and may contain some graphite and Ti carbo-nitride (TiCN). Material reported as ceramic in appearance is very finely crystalline. The alteration products often include calcite and gypsum but are mostly silicate and/or sulpho-aluminate hydrates that are difficult to identify specifically under the microscope.

Basic steel slag. When present this consists mainly of dicalcium silicate, mostly the β-form (larnite) but sometimes the alpha form. Phosphoric slags may contain nagelschmidtite (Ca_7SiO_4 with $Ca_3P_2O_8$ in solid solution). Other silicate often present in small amounts, unetched by dilute HCl, is probably melilite. RO, R_2O_4 and RF phases are typically present and are mainly FeO and Fe_2O_4 with some Mg, Mn, Ca, etc. in solid solution and complex Ca alumino-ferrites. There may also be some Fe_2O_3 and spinel ($(Mg,Fe)Al_2O_4$). The slag typically carries minor amounts of periclase (MgO with some Fe in solid solution) and lime phase (CaO with some Fe, Mn & Mg in solid solution). Other possible minor constituents include fluorite (CaF_2) and apatite (Ca fluoro-phosphate), the last present in phosphoric slags. The alteration products are, again, difficult to identify specifically but are probably, mainly, hydrated silicates. Portlandite ($Ca(OH)_2$) may be present.

Basic refractory material. When present, this is mainly magnesian and consists of granular periclase (MgO) with interstitial silicates. Sometimes samples contain chrome-magnesia material with chromite present in addition to the other phases. Hot face material (from close to the furnace) may also occur. The periclase and interstitial silicates show secondary alteration similar to that of the basic steel slag. Brucite ($Mg(OH)_2$) is likely.

Acid steel slag. When present this consists mainly of fayalite ($(Fe,Mn)_2SiO_4$), Fe,Mn oxides and cristobalite (high temperature SiO_2).

Other slags. The 'intermediate slag' (probably primary flush slags from steel furnaces) has a variable phase assemblage, being mainly formed of silicates, particularly dicalcium silicate, melilite, merwinite and a complex olivine phase together with spinel and wustite (FeO). Sometimes it contains significant amounts of periclase, well embedded in the slag. The 'ferrous slag' (probably from foundry operations) has similar silicates but much more substantial content of iron oxides, usually wustite. It is often associated with scale (iron oxides formed on the surface of steel during reheating/cooling). When present, the 'cindery slag' consists of various silicates and silicate glass with Fe oxides, hercynite ($FeAl_2O_4$) and, sometimes, corundum (Al_2O_3). It is usually derived from heating furnaces and is often associated with burnt shale. When present, the 'siliceous clinker' is similar but devoid of iron oxides.

Other constituents The alumino-silicate brick includes a range of refractory firebrick, common brick and alumina-rich refractories. The 'quartz, sandstone, etc.' may include used silica refractory material consisting of quartz and its high temperature forms. Sometimes there is a distinct granular texture and it is derived from silcrete, a kind of chert. Cementitious material may bond the finer particles together. It is similar to the other alteration products consisting mostly of complex hydrates difficult to identify under the microscope. Sometimes some is used Portland cement recognised by the relict textures of the clinker and the embedded quartz sand.

APPENDIX B

MECHANISMS OF VOLUMETRIC INSTABILITY IN IRON AND STEEL INDUSTRY SLAGS

Volumetric change with time can occur in some types of iron and steel industry slags. These mechanisms are briefly described in this section.

Blast Furnace Slags

Fresh-make air-cooled, i.e. crystalline, blast furnace slags are almost always volumetrically stable after cooling. The two mechanisms for volumetric instability listed in BS1047:1983 – "Air Cooled Blast furnace Slag for use in Construction" are:-

a) Beta to gamma inversion of dicalcium silicate.

b) Iron unsoundness.

a) Research by G H Thomas on this phase transformation has shown the transformation to be athermal rather than isothermal. In practical terms this means that inversion, and the expansion associated with it, can only occur during the cooling cycle. In fully cooled material there would appear to be no further risk of instability from this mechanism.

b) Iron unsoundness is a very rare form of instability frequently associated with operating problems in the blast furnace. TRS know of only one instance in over 40 years. The mechanism, which is a hydrolysis reaction, is immediately triggered off by the presence of water. Once water has initiated the reaction, the mechanism proceeds to completion. It is impossible to arrest the process once started; at least by methods operating in normal ambient conditions.

It follows that the risk of late expansion from either of these mechanisms in blast furnace slag is remote.

c) Sulphoaluminate Type Activity

Some years ago, G. H. Thomas discovered a third mechanism that may give rise to volumetric instability. The process is possible only in some old blast furnace slag altered

by weathering. When the sulphide sulphur in the blast furnace slags is oxidised during weathering to sulphate, under some circumstances reactions can take place within the slag to produce an 'ettringite' type product. The process is somewhat analogous to sulphatic attack on concrete and has a similar result - expansion of the mass and associated disruption.

For the mechanism to have any significance, the slag needs to have residual potential for this reaction. Evidence of past activity does not necessarily indicate further reaction is possible.

The TRS accelerated expansion test is, we believe, uniquely capable of identifying such slags, as well as instability attributable to free CaO and free MgO in steel slag & etc.

Basic Steel Slags

Basic steel slags commonly contain significant quantities of free CaO and free MgO. These free oxides are well known for the massive expansion associated with their hydration. In practical terms, it is impossible to forecast when hydration will take place, but it can be up to decades after the material was cooled – or placed. The reasons are complex, but include the varying density of the oxides, due to the variation in temperatures at which the products have been held in the furnace. Other factors influencing rate of hydration include:-

- the protection of slags by a reaction product at the oxide interface with the slag.
- the presence of the oxides as lime or magnesia rich solid solutions instead of the pure oxide.

The result is potential future volumetric instability but at an unforeseeable date. Periclase, i.e. free MgO, is relatively much slower than free CaO to hydrate.

Scrap High Magnesia Refractories

These are particularly undesirable components in fill as they commonly result in high concentrations of free MgO. The problems associated with these concentrations are similar to those where periclase is found in basic steel slag.

APPENDIX I

Specialist Chemical Testing

(Tested Externally)

Certificate of Analysis

Certificate Number	20-12202,20-12303,20-12415,20-13862,20-12854,20-19768	13-Nov-20

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference	20-12202,20-12303,20-12415,20-13862,20-12854,20-19768
Client Reference	4291
Order No	(not supplied)
Contract Title	Metal Processing Area Shallow Soils Investigation
Description	37 Soil samples, 10 Leachate samples.
Date Received	08-Jul-20
Date Started	08-Jul-20
Date Completed	13-Nov-20
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

Adam Fenwick
Contracts Manager

2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 20-12202,20-12303,20-12415,20-13862,20-12854,20-19768
Client Ref 4291
Contract Title Metal Processing Area Shallow Soils Investigation

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
MPA_AUK_TP119	3	1	1694833	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP114	2A	0.8	1694834	10/08/2020	Dark brown sandy GRAVEL (sample matrix outside MCERTS scope of accreditation)
MPA_AUK_TP109	3	0.9	1694835	10/08/2020	Dark brown sandy GRAVEL (sample matrix outside MCERTS scope of accreditation)
MPA_AUK_TP116	3	0.8	1694836	10/08/2020	Dark brown sandy GRAVEL (sample matrix outside MCERTS scope of accreditation)
MPA_AUK_TP115	3	0.6	1694837	10/08/2020	Dark brown sandy GRAVEL (sample matrix outside MCERTS scope of accreditation)
MPA_AUK_TP123	3	1	1695460	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP120	3	0.8	1695461	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP121	3	0.8	1695462	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP122	3	0.7	1695463	10/08/2020	Dark brown sandy GRAVEL (sample matrix outside MCERTS scope of accreditation)
MPA_AUK_TP124	3	0.8	1695464	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP125	3	0.8	1695465	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP106	3	1	1696136	10/08/2020	Dark grey very gravelly SAND
MPA_AUK_TP107	3	0.9	1696137	10/08/2020	Dark grey very gravelly SAND
MPA_AUK_TP112	3	0.9	1696138	10/08/2020	Dark grey very gravelly SAND
MPA_AUK_TP113	3	0.9	1696139	10/08/2020	Dark grey very gravelly SAND
MPA_AUK_TP117	3	0.6	1696140	10/08/2020	Dark grey very gravelly SAND
MPA_AUK_TP118	3	0.8	1696141	10/08/2020	Dark grey very gravelly SAND
MPA_AUK_TP126	3	0.8	1699073	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP127	3	0.9	1699074	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP128	3	0.9	1699075	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP129	3	1.1	1699076	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP130	3	0.6	1699077	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP102A	3	1	1699078	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP110	3	1	1699079	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP111	3	1.2	1699080	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP101	3	0.9	1705062	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP101	9	3.5	1705063	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP102	3	0.6	1705064	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP103	3	0.8	1705065	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP104	3	1	1705066	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP105	3	1	1705067	10/08/2020	Dark brown gravelly SAND
MPA_AUK_TP108	3	1	1705068	10/08/2020	Dark brown gravelly SAND
SSA	A	0	1740101	10/08/2020	Dark grey very gravelly SAND
SSD	D	0	1740102	10/08/2020	Dark grey very gravelly SAND
SSC	C	0	1740103	10/08/2020	Dark grey very gravelly SAND
SSE	E	0	1740104	10/08/2020	Dark grey very gravelly SAND
SSB	B	0	1740105	10/08/2020	Dark grey very gravelly SAND

Summary of Chemical Analysis
Soil Samples

Our Ref 20-12202,20-12303,20-12415,20-13862,20-12854,20-19768
Client Ref 4291
Contract Title Metal Processing Area Shallow Soils Investigation

			Lab No	1694833	1694834	1694835	1694836
			Sample ID	MPA_AUK_TP1 19	MPA_AUK_TP1 14	MPA_AUK_TP1 09	MPA_AUK_TP1 16
			Depth	1	0.8	0.9	0.8
			Other ID	3	2A	3	3
			Sample Type	ES	ES	ES	ES
			Sampling Date	06/07/2020	06/07/2020	06/07/2020	06/07/2020
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Asbestos Quantification	DETSC 1102	0.001	%				
Metals							
Aluminium	DETSC 2301*	1	mg/kg	19000	13000	29000	8000
Antimony	DETSC 2301*	1	mg/kg	5.6	11	2.5	7.1
Arsenic	DETSC 2301#	0.2	mg/kg	21	2.3	64	7.2
Barium	DETSC 2301#	1.5	mg/kg	450	91	190	120
Beryllium	DETSC 2301#	0.2	mg/kg	2.1	0.2	3.4	0.5
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.4	2.5	3.8	4.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.3	1.6	0.5
Chromium	DETSC 2301#	0.15	mg/kg	290	550	48	340
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	36	41	35	52
Iron	DETSC 2301	25	mg/kg	91000	240000	22000	160000
Lead	DETSC 2301#	0.3	mg/kg	41	8.9	550	31
Magnesium	DETSC 2301*	1	mg/kg	18000	28000	17000	21000
Manganese	DETSC 2301#	20	mg/kg	9200	17000	1600	17000
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	3.0	3.0	0.8	5.7
Nickel	DETSC 2301#	1	mg/kg	21	21	11	39
Silicon	DETSC 2301*	10	mg/kg	63000	53000	63000	13000
Vanadium	DETSC 2301#	0.8	mg/kg	700	390	82	1100
Zinc	DETSC 2301#	1	mg/kg	170	47	230	94
Inorganics							
pH	DETSC 2008#		pH	11.3	12.7	10.8	11.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	0.1	0.5
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6
Organic matter	DETSC 2002#	0.1	%	4.2	0.2	0.7	0.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	180	< 10	1000	34
Sulphur (free)	DETSC 3049#	0.75	mg/kg	< 0.75	< 0.75	2.4	2.2

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Summary of Chemical Analysis

Soil Samples

Our Ref 20-12202,20-12303,20-12415,20-13862,20-12854,20-19768
Client Ref 4291
Contract Title Metal Processing Area Shallow Soils Investigation

			Lab No	1694833	1694834	1694835	1694836
			Sample ID	MPA_AUK_TP1 19	MPA_AUK_TP1 14	MPA_AUK_TP1 09	MPA_AUK_TP1 16
			Depth	1	0.8	0.9	0.8
			Other ID	3	2A	3	3
			Sample Type	ES	ES	ES	ES
			Sampling Date	06/07/2020	06/07/2020	06/07/2020	06/07/2020
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
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	3.7
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	14
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	110
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	120
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	3.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	21
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	25
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	150
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.04
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.20	< 0.03	< 0.03	1.0
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.05
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.35	0.03	< 0.03	1.2
Pyrene	DETSC 3303#	0.03	mg/kg	0.29	< 0.03	< 0.03	0.78
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.15	< 0.03	< 0.03	0.23
Chrysene	DETSC 3303	0.03	mg/kg	0.19	< 0.03	< 0.03	0.35
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.22	< 0.03	< 0.03	0.34
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.08	< 0.03	< 0.03	0.13
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.12	< 0.03	< 0.03	0.12
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.10	< 0.03	< 0.03	0.09
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.11	< 0.03	< 0.03	0.10
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	1.8	< 0.10	< 0.10	4.4

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