Lovell Partnerships Limited

PROJECT RIVERSIDE, MERTHYR VALE

Reclamation and Remediation Validation Report

12235/AF/18/VR

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Intégral
Géotechnique

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CONTENTS

1.0 INTRODUCTION

1.1 General

1.2 Proposed Development

2.0 BACKGROUND

2.1 Site Location and Description

2.2 Available Site Investigation Data

2.3 Ground Conditions Summary

2.4 Identified Contamination

2.5 Residual Structures – Pre-Reclamation Works

2.6 Conceptual Site Model

2.7 Summary Site Specific Risk Assessment

3.0 RECLAMATION and REMEDIATION IMPLEMENTATION

3.1 Summary Strategy

3.2 Works Undertaken

4.0 RECLAMATION VERIFICATION and REMEDIATION VALIDATION

4.1 Report Objectives

4.2 Reclamation Verification and Data Gathering

4.3 Remediation Validation

APPENDICES

Appendix A Chemical Test Results – Soils (During Turn and Compact)

Appendix B Summary of Chemical Test Results – Soils (During Turn and Compact)

Appendix C Chemical Test Results – Leachates (During Turn and Compact)

Appendix D Summary of Chemical Test Results – Leachate (During Turn and Compact)

Appendix E Chemical Test Results – Soils (Importation)

Appendix F Summary of Chemical Test Results – Soils (Importation)

Appendix G Chemical Test Results – Leachates (Importation)

Appendix H Summary of Chemical Test Results – Leachate (Importation)

Appendix I Laboratory Geotechnical Test Results (During Turn and Compact/Importation)

Appendix J In-situ Test Results – Plate Load Tests (During Turn and Compact)

Appendix K in-situ Test Results – Plate Load and CPT Tests (Validation of Remediation Surface)

Appendix L Chemical Test Results – Soils (Validation of Remediation Surface)

Appendix M Summary of Chemical Test Results – Soils (Validation of Remediation Surface)

INTERIM

CONTENTS (CONTINUED)

FIGURES

Figure 1 Site Location Plan

Figure 2 Trial Pit Location Plan (Chemical Sampling Turn and Compact)

Figure 3 Plate Load Test Location Plan (Physical Validation Turn and Compact)

Figure 4 In Situ Test Location Plan (Physical Validation of Remediation Surface)

Figure 5 Chemical Sample Location Plan (Chemical Validation Remediation Surface)

INTERIM

1.0 INTRODUCTION

1.1 GENERAL

Lovell Partnerships are in the process of reclaiming and remediating Project Riverside, Merthyr Vale located at the site of the former Merthyr Vale Colliery.

The site is being remediated for residential end use. The development has been named Ymyl Yr Afon.

Intégral Géotechnique (Wales) Limited were appointed as the Geotechnical Engineers to design and undertake site investigations, risk assessments and prepare a Remediation Strategy Report for the site, (Reference: 11826LP/18/ORSR, dated March 2018) in order to provide a clear set of remediation activities required to render the site acceptable for residential re-development.

Walter UK Limited (Walters) were contracted by Lovell Partnerships to undertake the enabling works for the proposed residential development plateau.

The Site Investigation Report and Remediation Strategy Report were agreed by the Planning Department of Merthyr Tydfil County Borough Council.

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The subsequent grid sampling and testing works, site monitoring of reclamation works and supervision and validation of the works is based upon the above reports. This report certifies that development land has been satisfactorily reclaimed in accordance with the remediation strategy and risk assessment reports.

This report should be submitted to Merthyr Tydfil County Borough Council and the NHBC in order to discharge relevant Planning Conditions and NHBC Engineering and Land Quality Conditions.

It should be noted that this validation report does not include the final capping layer to gardens and areas of soft landscaping. These materials should be placed by the developer and validated on a plot by plot basis, as and when they are completed. These works should be covered under a separate validation report.

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1.2 PROPOSED DEVELOPMENT

An enabling operation is to be carried out to render the area suitable for a residential development. The development (Ymyl yr Afon) is likely to comprise the construction of some 160 low rise houses and apartments, with private gardens, areas of soft landscaping, car parking, access roads and associated infrastructure.

A development plateau is to be achieved by an initial site clearance, turn and re-compaction of in situ made ground, removal of residual buried obstructions, raising of existing site levels by importation of suitable inert soils and the placing of all material in a controlled engineering manner (well compacted layers).

Following the site clearance, which includes the excavation and stockpiling of the existing surface vegetation, the site will need to be raised to the proposed development levels with acceptable imported clean structural fill.

The proposed earthworks levels were set prior to commencement of the reclamation/remediation works and are illustrated on the three key design drawings as supplied by Jubb and summarised below:

- Proposed Formation Surface (depth of reduced excavation typically 2m below underside of foundations);
- Proposed Remediation Surface (final earthworks level, typically 900mm below final slab/garden levels); and
- Proposed Plot Surface (final slab/garden levels).

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It is intended to prepare an engineered earthworks plateau (remediation surface) for the areas of proposed foundations, for appropriately designed reinforced concrete raft type foundations with a characteristic applied working load of 50kN/m^2 (average of less than 30kN/m^2), designed for a 3m lack of support over a soft spot and a 1.5m cantilever at building corners, bearing onto the prepared remediated earthworks formation.

Completion works for the development, such as filling to final highway, hard finished and public open space levels, building works, infrastructure and externals including sourcing and placing of clean inert soils to soft landscape areas will be by others with a requirement for independent third-party supervision and validation.

2.0 BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The site is located at a former colliery site Merthyr Vale some 7km south of Merthyr Tydfil at an approximate National Grid Reference of 307440 199970. The location of the site is shown on Figure 1.

The site is linear and crescent shaped, occupying an area of approximately 5.8 hectares. The boundaries of the site are defined by existing mature trees and scrub vegetation to the east, the B4285 road (Golwg yr Afon) to the west, derelict vacant land to the north and a roundabout to the south.

Following the closure of the former Merthyr Vale Colliery in 1989 all buildings associated with the colliery were demolished. A previous land reclamation scheme, commissioned by Merthyr Tydfil County Borough Council, was carried out in 1999.

Prior to the current phase of reclamation/remediation works the site was generally level, covered with grass and scrub type vegetation and used as informal public open space. A line of trees was situated to the south west of the site. A public footpath crossed the northern area of the site in an east to west trend. A series of shallow ditches locally culverted cross the site. Soft waterlogged ground was recorded to the far north of the site.

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The River Taff runs in a north to south direction some 150m to the west of the site.

Two infilled and capped mine shafts are located on the outside of the development area close to the central eastern boundary of the site. These are marked with concrete plinths.

The site was largely surrounded by wire fencing.

2.2 AVAILABLE SITE INVESTIGATION DATA

The following reports were reviewed as part of the original site investigation works and risk assessment:

- Intégral Géotechnique (Wales) Limited. Geotechnical Desk Study: Merthyr Vale Mid Glamorgan. Dated March 1992 (Reference: 5213/C/2).
- Richards Moorehead & Laing Limited. Completion Report on the Reclamation of the Colliery Site by Coal Recovery Methods including Civil Engineering Works: Merthyr Vale Colliery Land Reclamation Scheme. Dated July 1999. (Reference: ajd/cjh/mjr/1437c).

2.2 AVAILABLE SITE INVESTIGATION DATA (CONTINUED)

- Earth Science Partnership. Factual Ground Investigation Report: Project Riverside, Merthyr Vale. Dated August 2014 (Reference: ESP.5528b.2109).

Intégral Géotechnique (Wales) Limited were commissioned to undertake follow up site investigations. The reports are referenced below:

- Intégral Géotechnique (Wales) Limited. Site Investigation Report: Project Riverside, Merthyr Vale. Dated October 2016 (Reference: 11826/LW/16/SI Rev A); together with supplementary letter reports Dated 10th November 2016 and 3rd March 2017 (Reference: 11826/LW).

The above reports have been used to form the basis of the following remediation strategy report:

- Intégral Géotechnique (Wales) Limited. Outline Remediation Strategy Report: Project Riverside, Merthyr Vale. Dated March 2018 (Reference: 11826/LP/18/ORSR).

Prior to the commencement of the enabling earthworks Intégral Géotechnique (Wales) Limited were commissioned to undertake a groundwater risk assessment site investigation as referenced below:

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- Intégral Géotechnique (Wales) Limited. Groundwater Risk Assessment Report: Project Riverside, Merthyr Vale. Dated May 2018 (Reference: 11826/TD).

For completeness this report should be read in conjunction with the above reports.

2.3 GROUND CONDITIONS SUMMARY

Geologically, the ground conditions generally comprise a varying thickness of made ground over superficial glacial till deposits.

The made ground comprised loose to medium dense silty sandy gravel (colliery spoil) with varying content of brick, timber, metal fragments, wires, concrete and/or sandstone/mudstone cobbles and boulders. Made ground was encountered to a maximum depth of 5.50m bgl.

2.3 GROUND CONDITIONS SUMMARY (CONTINUED)

The made ground was underlain by superficial deposits consisting of glacial till. The glacial till typically comprised loose/soft silty clayey sand or sandy clay becoming a loose to dense sand and gravel with layers of clay and sand.

The glacial till deposits were proven to maximum depth of 15.50m bgl and was found to be of a maximum thickness of 13.20m.

Possible bedrock was encountered in two locations (BH5 and BH6), located in the southern area of the site. The possible bedrock was encountered at depths of between 6.50m and 7.80m bgl.

During the site investigations groundwater was encountered at depths of between 0.50m and 6.30m bgl.

2.4 IDENTIFIED CONTAMINATION

During the previous site investigations undertaken by Intégral Géotechnique (Wales) Limited, representative soil samples were taken from across the site and tested for a range of chemical elements/compounds.

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The suite of geo-environmental laboratory testing undertaken on the thirteen samples from the initial investigation and a further two soil samples from the former gas works area was based on the guidelines provided in the Environment Agency CLR publications as part of the CLEA Model, and other contaminants typical of brownfield sites. The testing suite comprised:

- Beryllium, arsenic, cadmium, total chromium, chromium III, chromium VI, copper, lead, mercury, vanadium, sulphide, nickel, zinc, boron, elemental sulphur, selenium, Total cyanide, pH value, total sulphate, water soluble sulphate, monohydric phenol, total polyaromatic hydrocarbons (PAH), petroleum hydrocarbons (VPH/EPH), asbestos screen and organic content.

Initial Site Investigation Results

The results of samples taken from the made ground indicated that most of the analysed chemical elements or compounds were present at concentrations below the appropriate thresholds. However, the initial screening indicates exceedances of several speciated PAH compounds. Asbestos was detected within some samples of made ground. One single exceedance of petroleum hydrocarbons in the aromatic C21-C35 carbon band was found within the former gas works area.

2.4 IDENTIFIED CONTAMINATION (CONTINUED)

Benzo(a)anthracene was detected within samples of made ground ranging from <0.10 to 11mg/kg with one out of ten samples exceeding the adopted screening value of 7.2mg/kg (S4UL 1%). The exceedance of benzo(a)anthracene was detected within a sample from TP12 (1.0mbgl) at 11mg/kg.

Benzo(b)fluoranthene was detected within samples of made ground ranging from <0.10 to 6.7mg/kg with five out of ten samples exceeding the adopted screening value of 2.6mg/kg (S4UL 1%). The highest concentration of benzo(b)fluoranthene was detected within a sample from TP12 (1.0mbgl) at 6.7mg/kg.

Dibenzo(ah)anthracene was detected within samples of made ground ranging from <0.10 to 0.82mg/kg with four out of ten samples exceeding the adopted screening value of 0.2mg/kg (S4UL 1%). The highest concentration of dibenzo(ah)anthracene was detected within a sample from TP12 (1.0mbgl) at 0.82mg/kg.

Napthalene was detected within samples of made ground ranging from <0.05 to 2.7mg/kg with one out of ten samples exceeding the adopted screening value of 2.3mg/kg (S4UL 1%). exceedance was detected within a sample from TP15 (1.0mbgl) at 2.7mg/kg.

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Asbestos was identified in three out of ten samples of made ground. Fibres of chrysotile were identified within the made ground at TP10 (1.0mbgl) and TP12 (0.1mbgl). Chrysotile insulation lagging was identified within the made ground at TP11 (1.0mbgl).

The results of the quantification testing indicate the asbestos in the made ground to be <0.001% asbestos by weight. Fragments of ACM were identified during the excavation of the trial pits and trenches.

No further exceedances were detected within the samples of made ground.

No other visual or olfactory evidence of contamination of the in-situ natural ground was identified during the drilling of the boreholes and excavation of the trial pits. At the time of the site investigation, no samples of natural ground were tested.

Former Gas Works Area Results

Benzo(b)fluoranthene was detected within samples of made ground ranging from 4.7mg/kg and 5.0mg/kg with both samples exceeding the adopted screening value of 2.6mg/kg. The highest concentration was detected within TP103 (at 1.0mbgl) at 5.0mg/kg.

2.4 IDENTIFIED CONTAMINATION (CONTINUED)

Dibenzo(ah)anthracene was detected within samples of made ground ranging from 0.48mg/kg and 0.55mg/kg with both samples exceeding the adopted screening value of 0.2mg/kg. The highest concentration was detected within TP103 (at 1.0mbgl) at 0.55mg/kg.

Naphthalene was detected within samples of made ground ranging from 2.4mg/kg and 3.4mg/kg with both samples exceeding the adopted screening value of 2.6mg/kg. The highest concentration was detected within TP103 (at 1.0mbgl) at 3.4mg/kg.

Petroleum hydrocarbons in the aromatic C21-C35 carbon band was detected within samples of made ground ranging from 73mg/kg and 1400mg/kg, with one out of the two samples exceeding the adopted screening value of 1100mg/kg. The highest concentration was detected within TP103 (at 1.0mbgl) at 1400mg/kg.

Asbestos was not detected within the samples.

Ground Gas

Ground gas monitoring undertaken by Intégral Géotechnique (Wales) Limited indicated a maximum methane concentration of 0.6% and a maximum carbon dioxide concentration of 1.5%. A maximum gas flow rate of <0.3l/hr was measured during the gas monitoring programme.

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In accordance with CIRIA Report C665 a Gas Screening Value (GSV) of <0.0045l/hour has been calculated. This GSV corresponds to gas characteristic situation 1/green which does not require any special gas protective measures.

2.5 RESIDUAL STRUCTURES – PRE-RECLAMATION WORKS

The above ground structures relating to the former colliery were previously demolished to slab level following the closure of the site and subsequent reclamation works carried out in circa 1999.

During the site investigations carried out by IG, buried obstructions were encountered at several locations, typically comprising of brick or concrete bases, brick/stone masonry walls and stone culverts. Numerous large cobble and boulder size fragments of demolition rubble/masonry were also encountered.

Therefore, locally a number of residual sub-structures, including foundations, culverts, possible basements, etc, remained beneath the site surface which required removal to 2m below underside of foundation level as part of the planned site reclamation works.

2.6 CONCEPTUAL SITE MODEL

Based on the findings and observations, a conceptual site model has been defined for the site. This includes consideration to the identified made ground and proposed residential occupation.

The active pathways by which future end users and the wider environment could be affected by the contaminant sources identified are listed below:

1. Outdoor/indoor ingestion of soil;
2. Vegetable uptake;
3. Outdoor/indoor exposure to soil through skin contact;
4. Outdoor/indoor inhalation of fugitive dust;
5. Migration of contaminants in ground to drinking water supply pipes

The remediation works to be carried out at the site have been designed to address the identified potentially active contaminant pathways listed above.

2.7 SUMMARY SITE SPECIFIC RISK ASSESSMENT

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The general approach for assessing the potential risk to a receptor is by a combination of qualitative and quantitative risk assessment. A quantitative risk assessment would involve selecting and deriving generic assessment criterion to compare low risk substances, based on the fate, transport and toxicological properties and the exposure scenario being considered.

Due to the identified presence of hot spots/areas of speciated PAH compounds, petroleum hydrocarbons and asbestos, remedial measures are required in order to remove the potential risk to future end users.

The existing made ground soils do not meet the re-use criteria for the residential garden areas. The recommended remediation option is for the importation of a capping layer to all garden areas. The risk posed by the identified contaminants is considered low subject to the garden capping works being carried out.

The cover system should comprise a minimum 600mm of suitable clean material introduced to the garden areas as a cover system together with a suitable visual alert membrane (geotextile layer) placed at the base of the imported clean capping material.

In areas of hardstanding the pollutant linkage will be broken by the concrete/tarmac surfaces.

2.7 SUMMARY SITE SPECIFIC RISK ASSESSMENT

Asbestos containing materials (ACM's) were identified during the site investigation. Allowances should be made for the handpicking of any ACMs observed during the planned reclamation works. These materials should only be handled by suitably asbestos awareness trained operative.

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3.0 RECLAMATION AND REMEDIATION IMPLEMENTATION

3.1 SUMMARY STRATEGY

The main objective of the proposed reclamation and remediation works is to render the site suitable for use as a residential development. This will involve the excavation, processing and relaying/compaction of the existing made ground to enable to proposed redevelopment; typically comprising the processing of surface/buried structures and re-cycling of the materials for re-use and dealing with any contamination issues.

As part of the earthwork's strategy, the importation of inert soils is required in order to raise the existing site levels to the proposed remediated plateau levels. This material will be placed above the recompacted made ground fill and compacted and graded to the proposed remediation surface (final earthworks level).

The required reclamation and remediation activities defined by our Remediation Strategy Report and Summary of the Required Site Remediation/Reclamation Works Specification are referenced below:

- Intégral Géotechnique (Wales) Limited. Outline Remediation Strategy Report: Project Riverside, Merthyr Vale. Dated March 2018 (Reference: 118/LP/18/ORSR.
- Intégral Géotechnique (Wales) Limited. Summary of the Required Site Remediation/Reclamation Works: New Residential Development at Riverside, Merthyr Vale. Dated October 2016 (Reference: 11826/TD/16).

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The strategy for reclamation and remediation implementation can be summarised as follows:

- To provide an engineered formation free from obstructions to a depth of at least 2m from the underside of foundations and suitable for the construction of reinforced concrete raft type foundations with a characteristic applied working load of 50kN/m^2 (average of less than 30kN/m^2), designed for a 3m lack of support over a soft spot and a 1.5m cantilever at building corners, bearing onto the prepared remediated plateau;
- If encountered in-situ/ex-situ remediation or removal to licenced landfill of any free phase hydrocarbon impacted soils/waters that may present a risk to human health via the inhalation of vapours;
- Break any potential pathway between proposed site end users and made ground deposits;

3.1 SUMMARY STRATEGY (CONTINUED)

- Removal of redundant sewers, service ducts and culverts and buried obstructions.

Given the identified contaminants of concern within the general made ground encountered across the site, and the historical use, the remediation strategy has been designed to address the following relevant pollutant linkages:

- Inhalation of soil dust;
- Dermal contact with soil;
- Ingestion of soil/soil on home-grown produce;

Following completion of the reclamation works, and in order to cut the pathway to the end users of the site, it will be necessary to provide a suitable capping system i.e. a minimum thickness of 600mm of clean imported subsoil/topsoil and a visual alert membrane to all gardens and areas of soft landscaping to effectively cut dermal, ingestion and inhalation of dust pathways to end users.

It should be noted that the final placement of the capping layer should be carried out by the developer as and when individual plots and phases are completed. These works should be inspected and validated independently upon placement of the capping soils.

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Review of the remedial methodologies will be a continuing process and will be subject to the findings of the validation works, and if necessary quantitative risk assessments.

3.2 WORKS UNDERTAKEN

3.2.1 Phasing of the Remediation Works

The works are to be undertaken in a single phase, dependent on the proposed build programme, currently planned to progress generally from the south to the north but also initially in the far north where Lovell's site compound was to be constructed. The remediation works will continue to be undertaken under the monitoring of Intégral Géotechnique (Wales) Limited.

3.2.2 Site Establishment

A contract for site reclamation/remediation works was awarded to Waters UK Limited. A normal site establishment was considered appropriate with welfare and PPE arrangements for similar type of brownfield sites.

3.2 WORKS UNDERTAKEN (CONTINUED)

During the site works, a reporting system between Intégral Géotechnique and Walters UK Limited was established to identify and report if any occurrences of impacted perched water or soils were observed. In the event of such occurrences appropriate remedial measures would be undertaken in a controlled and supervised fashion.

Site preparation and operational constraints were covered by the appointed contractor's method statements. Site procedures for managing the works in a manner that would not cause pollution to controlled waters was covered in the appointed contractor's method statements.

3.2.3 Preliminary Works

All surface fly tipped materials and existing vegetation were removed from site. The site was protected by replacing the existing wire fencing, by constructing security wire fence panels which now surround the site.

3.2.4 Excavation

The land reclamation works were carried out between mid June and late September 2018.

Where undisturbed in situ natural strata was encountered at depths less than 2.0m from proposed remediation surface level, the excavation was terminated in competent strata.

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Materials excavated from the site were subject to screening and processing to remove any unacceptable materials such as metal, plastic, timber, etc. Granular materials were subject to crushing prior to materials being approved for re-use at the site.

All surplus deleterious materials were removed off-site. All acceptable excavated materials for re-use were stockpiled on site. The processing, sorting, crushing and removal of unacceptable materials resulted in a uniform/more consistent material suitable for re-engineering.

During and prior to the turn and compact earthworks a series of trial pits (TP1 to TP39), were excavated through the existing fill to depths comparable to the proposed reduced formation (2m below the underside of the proposed foundation). The trial pit locations are shown on Figure 2.

The pitting was carried out to pre-inform the chemical validation prior to /concurrent with the earthworks and identify if any significant hot spots of contamination were present. Two samples were taken for chemical testing, typically from the upper and lower layer of the excavation (or from different soils if encountered) in order to represent the full thickness of the made ground fill.

3.2 WORKS UNDERTAKEN (CONTINUED)

The results of the soil contaminant grid testing taken during the reduced excavation are presented in Appendix A, Chemical Test Results – Soils (During Turn and Compact). The results are summarised in Appendix B, Summary of Chemical Test Results – Soils (During Turn and Compact).

The results of the laboratory testing were comparable to the findings of the previous site investigations and site history and indicate that the majority of the analysed chemical elements or compounds are present at concentrations below the appropriate thresholds guidelines for residential with home grown produce end-use.

However, the initial screening indicates a single exceedance of mercury, at 1.7mg/kg, in TP18 and a single exceedance of arsenic, at 47mg/kg, in ES5 (TP3).

A single exceedance of petroleum hydrocarbons in the aromatic C12 – C16/C16 – C21 carbon band was found TP14.

Exceedances of several speciated PAH compounds were recorded at numerous locations (ES2 (TP1), ES6 &, ES7 (TP3), TP4, TP18, TP16, TP14, TP20, TP22, TP24, TP26, TP28, TP30, TP32, TP34, TP36 and TP38).

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Out of seventy-eight samples of made ground tested, asbestos was detected in twenty.

Each sample was further quantified in order to determine the percentage of asbestos within the samples and depths as outlined below:

TP18 (1.25m)	<0.001% (Chrysotile – loose fibres)
TP16 (1.00m)	<0.001% (Chrysotile - loose fibres)
TP15 (0.30m)	<0.001% (Chrysotile & crocidolite - loose fibres)
TP14 (1.00m)	0.006% (Chrysotile - loose fibrous debris)
TP27 (0.10)	<0.001% (Crocidolite - loose fibres)
TP28 (0.25m)	0.001% (Chrysotile - loose fibres)
TP28 (0.75m)	<0.001% (Chrysotile - loose fibres)
TP29 (0.20m)	0.002% (Chrysotile & amosite – loose fibres)
TP29 (0.70m)	0.083% (Chrysotile & amosite – loose fibrous debris
TP32 (1.00m)	0.965% (Chrysotile, amosite & crocidolite) – loose fibrous debris)
TP33 (0.30m)	<0.001% (Chrysotile - loose fibres)
TP33 (1.30m)	<0.001% (Chrysotile & amosite - loose fibres)
TP34 (0.10m)	<0.001% (Chrysotile – loose fibres)
TP34 (0.90m)	0.005% (Chrysotile & amosite - loose fibres)
TP35 (0.50m)	0.001% (Chrysotile & amosite - loose fibres)

3.2 WORKS UNDERTAKEN (CONTINUED)

TP35 (1.30m)	0.003% (Chrysotile & crocidolite - loose fibres)
TP36 (0.25m)	0.003% (Crocidolite - loose fibres)
TP37 (1.50m)	<0.001% (Chrysotile - loose fibres)
TP38 (1.30m)	0.014% (Chrysotile – sheeting/board debris)
TP39 (0.10m)	<0.001% (Chrysotile & crocidolite - loose fibres)

Fibrous asbestos pipe lagging was encountered during the turn and compact works at TP32, coincidental with remnant substructures. Walters UK Limited undertook controlled hand picking for asbestos containing materials (ACM's) in and around the location of TP32, to a depth greater than 2.0m below proposed remediation surface. The work was undertaken by a specialist licenced contractor, Severn Insulation Co Ltd. Ten bags, approximately 100kg of hazardous asbestos waste was disposed of via Moorland Environmental Ltd. On completion of the hand picking, quad sampling was carried out. The samples were taken from the four faces and base of the excavation and tested for the presence of asbestos. The results of screening reported 2 samples, N and E with asbestos detects, further quantification reported fibres as <0.001%.

During a previous site investigation (Report Reference: 11826/TD) carried out by IG in April 2018, samples for leachate testing were collected from sixteen trial pits in order to undertake a groundwater risk assessment.

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For completeness the results of the leachate testing are presented in Appendix C, Chemical Test Results – Leachates (During Turn and Compact). The results are summarised in Appendix D, Summary of Chemical Test Results – Leachates (During Turn and Compact).

Prior to the placement of the fill materials the reduced formation/reduced excavated level was proof rolled and any soft/unsuitable materials exposed at the reduced level was removed ready for placement of suitable fill material. Where soft spots were excavated, the resulting void was benched prior to backfilling in controlled layers.

3.2.5 Importation of Soils

Only inert, non-contaminated material was to be brought to site. Extensive chemical sampling (soil and leachate testing) was carried out on all imported soils typically both at source and from stockpiles on site during the importation prior to the materials being laid. Prior to the importation of any materials to site Walters confirmed the source and anticipated volume of material to be imported and forwarded any available site investigation data/previous chemical test results to IG for scrutiny.

3.2 WORKS UNDERTAKEN (CONTINUED)

The results of the soil testing taken during the importation of the soils are presented in Appendix E, Chemical Test Results – Soils (Importation). A list of the soil importation sources and samples is included in Appendix E. The results are summarised in Appendix F, Summary of Chemical Test Results – Soils (Importation).

Contamination soils testing of imported materials have been compared to the relevant guidelines for residential developments with home grown produce.

The results of the laboratory testing indicate that the majority of the analysed chemical elements or compounds are present at concentrations below the appropriate thresholds guidelines for residential with home grown produce end-use.

However, a single sample, ES35, indicates an elevated concentration of lead at 870mg/kg which exceeds the C4SL guideline value of 200mg/kg.

The results of the leachate testing taken during the importation of the soils are presented in Appendix G, Chemical Test Results – Leachate (Importation). A list of the soil importation sources and samples is included in Appendix G. The results are summarised in Appendix H, Summary of Chemical Test Results – Leachate (Importation).

INTERIM

The results have been compared to either MAC-EQS for inland waters or Freshwater EQS (with a median hardness) and UK Drinking Water Standards.

The results for all determinands were reported below the appropriate screening values or below detection, notably polyaromatic hydrocarbons (PAH) and total petroleum hydrocarbons (TPH), with the exception of seven of the nineteen samples tested for copper and one for lead.

Samples L2, L3, L4, L6, L11, L12, L17 reported copper at elevated levels between 11ug/l and 26ug/l marginally above the EQS of 10ug/l but below UK Drinking Water Standards and lead at 15ug/l, marginally above the EQS of 10ug/l. It should be noted that the detected concentrations of copper and lead are not considered to be significant.

3.2.6 Replacement and Compaction Works

Both the in situ existing made ground and soils imported to site were processed and incorporated within the earthworks and placed and compacted in conventional engineered layers. The inert imported soils were placed above the recompacted made ground, depending on the remediated plateau levels to a depth, typically between 0.50m and 1.00m thick (locally >1.00m).

3.2 WORKS UNDERTAKEN (CONTINUED)

Earthworks material classification was undertaken on representative samples of the existing made ground fill and imported soils which were dispatched to the UKAS accredited laboratories of Apex Testing Solutions Limited (ATSL) and scheduled for geotechnical laboratory tests including the following:

- Moisture content tests;
- Atterberg limits testing;
- Dry density/ moisture content relationships and;
- Particle size distribution analysis.

The results of the laboratory testing are presented in Appendix I, Laboratory Geotechnical Laboratory Test Results.

All earthworks materials were selected placed and compacted in accordance with DTp Specification for Highways (600Series).

3.2.7 Oil Tank

During the reclamation works a previously unidentified buried structure was encountered on the site development boundary between the two capped shafts, see Figure 5.

INTERIM

Further investigation revealed a brick, concrete and masonry tank measuring some 5m by 2.5m in plan by 0.5m deep. The top of the tank was at a level approximately 1.8m below the remediated plateau level.

The contents of the tank, a thick black sludge, were identified as mineral oil and probably lube oil. Anecdotal evidence suggests the tank was for lubricating the pit head winding gear/ropes.

The contents of the tank, including the brick, and masonry walls and concrete base were removed as hazardous waste by Hargreaves (UK) Services Ltd to a licenced landfill site, Augean South Limited, East Northants Resource Management Facility, in Peterborough.

Following removal of the concrete base further concrete slabs were encountered. These were below the proposed reduced dig level and beneath an estate road. No deep drainage was indicated on the highways layout the slabs were, therefore, left in situ.

4.0 RECLAMATION VERIFICATION AND REMEDIATION VALIDATION

4.1 REPORT OBJECTIVES

A Reclamation and Remediation Validation Report is required to detail the data gathering requirements and to demonstrate that the works meet the site remediation criteria and have been carried out in accordance with the Implementation Plan, as detailed in Section 3.1.

4.2 RECLAMATION VERIFICATION AND DATA GATHERING

The reclaimed plateau has been verified by the following measures:

Re-engineering Works

During the turn and compact earthworks, a series of 34 No plate load tests were carried out at levels of between 150mm and 1600mm below the Remediated Surface of the site (Final Earthworks Level). The approximate locations of the plate load bearing tests (physical validation during turn compact earthworks) are shown on Figure 3.

The plate load tests were taken to a maximum applied pressure of 125kN/m^2. At the allowable bearing capacity of 50kN/m^2 settlements ranged between approximately 0.4mm and 5.4mm. At 100kN/m^2, settlements ranged between approximately 1mm and 14mm.

INTERIM

On completion of the earthworks a series of 24no plate load tests and 61no continuous CPTs using a window sample rig were carried out at/from the level of the Remediated Surface of the site (Final Earthworks Level). The approximate locations of the plate load bearing tests and CPTs (In Situ Test Location Plan Physical Validation of Remediation Surface) are shown on Figure 4.

The plate load tests were taken to a maximum applied pressure of 125kN/m^2. At the allowable bearing capacity of 50kN/m^2 settlements ranged between approximately 0.7mm and 4.8mm. At 100kN/m^2, settlements ranged between approximately 1mm and 13.5mm.

The CPT results ranged typically from 10 - 30 indicating a medium dense granular material and/or firm to stiff cohesive material.

The plate load test results and CPT results are considered satisfactory for 2/3 storey residential development using suitably designed reinforced concrete raft type with an allowable bearing capacity of 50kN/m^2 (average of less than 30kN/m^2), bearing onto the prepared remediated plateau.

4.2 RECLAMATION VERIFICATION AND DATA GATHERING (CONTINUED)

All foundations should be designed for a 3m lack of support over a soft spot and a 1.5m cantilever at building corners.

Copies of the plate bearing test results carried out during the turn and compact earthworks are presented in Appendix J.

Copies of the plate bearing test results carried out on the reclaimed plateau are presented in Appendix K.

To date, site levels have been raised to within approximately 800 to 900mm of final finished level subject to detailed engineering infrastructure design.

Contamination

The site has been reclaimed and approximately 1.0 to 2.0m of made ground materials have been excavated, processed and replaced in well-compacted layers. Finished levels were achieved by importing inert soils which were placed above the recompacted made ground. The imported soils form a layer typically between 0.50m and 1.00m thick (locally >1.00m) depending on the finished plateau levels.

INTERIM

Soil samples for the chemical validation post turn and compact earthworks have been taken at regular intervals across the site area, typically within the top 100mm to 200mm of the proposed remediation surface (Final Earthworks Level).

Samples were taken from the centre of each grid and referenced accordingly. The sampling grid is shown on Figure 5. The samples are considered to be representative of the shallow soils below the reclaimed plateau.

Forty-nine soil samples (V1 to V49) were taken and dispatched to the laboratories of i2 for laboratory chemical testing. The testing schedule was prepared to provide a screen for commonly occurring contaminants and potential contaminants identified from the historical use of the site and the findings of the desk study and the preliminary conceptual site model/conceptual exposure model. All testing was undertaken in a UKAS and MCerts accredited laboratory.

The concentrations of the following chemical elements/compounds were determined in the laboratories:

Beryllium	Cadmium
Total Chromium	Hexavalent Chromium (VI)
Copper	Lead

4.2 RECLAMATION VERIFICATION AND DATA GATHERING (CONTINUED)

Mercury	Nickel
Vanadium	Zinc
Arsenic	Boron
Selenium	Elemental Sulphur
Total Cyanide	Total Sulphate
Sulphide	Water Soluble Sulphate
pH	Monohydric Phenol
Polyaromatic Hydrocarbons (PAH)	Petroleum Hydrocarbons (VPH/EPH)
Semi-Volatile Organic Compounds (SVOC)	Volatile Organic Compounds (VOC)
Asbestos	

The results of all the soils testing are presented in Appendix L and summarised in Appendix M.

A single exceedance of lead, at 210mg/kg, was recorded in V15, a single asbestos detect was recorded in V34, this was quantified as <0.001%. Several PAH compound exceedances were recorded in V30, benzo(a)pyrene at 2.4mg/kg, benzo(b)fluoranthene at 2.9mg/kg and dibenzo(ah)anthracene at 0.35mg/kg.

Other than the tank referred to in Section 3.2.7, during the ground reclamation works there was no evidence, visual or olfactory, of any unusual materials.

INTERIM

The results of the validation testing are consistent with the original and supplementary site investigation findings, conceptual model and risk assessments.

The proposed remediation strategy of a visual alert membrane beneath a 600mm clean capping to soft landscape areas and hard cover of roads and buildings elsewhere has been confirmed by the validation testing to be appropriate. With the placement of the planned capping system any residual potential contaminant pathways will be broken.

It is therefore considered that following the capping works described above the site will not pose a potential risk to site end users and will meet the requirements of the remediation strategy agreed with the regulators.

4.3 REMEDIATION VALIDATION

This report is confirmation that the main remediation and reclamation works have been satisfactorily completed by Walters UK Limited, in accordance with the approved remediation strategy.

4.3 REMEDIATION VALIDATION (CONTINUED)

The site has been effectively reclaimed, and the validation test results confirm the successful completion of these works.

It should be noted that there is always a possibility that isolated and localised areas of residual minor contamination, such as areas with materials with low levels of asbestos fibres, may still be present. The proposed clean cap will deal with any residual exposure and associated risk as a result of such isolated areas.

The development will not be complete, in accordance with the remediation strategy for the site, until placement of the visual alert membrane and the clean 600mm (minimum thickness) capping soils to soft finished areas. Checks, in the form of site supervision, further sampling and testing of the placed subsoil and topsoil should be undertaken in order to confirm that an adequate thickness of inert soils are in place.

The capping system is to comprise imported clean inert materials conforming to the DEFRA soil guideline values for residential development with gardens.

Samples of topsoil and subsoil should be taken for laboratory analysis, as above, at the rate of approximately one in every four/five gardens.

INTERIM

Monitoring and validation of the final 600mm capping is typically late in works, usually on a plot by plot basis and should be maintained until the completion of the development.

Reporting of the clean capping to garden areas should be submitted independently of the reclamation works.

APPENDIX A

LABORATORY CHEMICAL TEST RESULTS – SOILS (DURING TURN AND COMPACT)

INTERIM

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i2 Analytical Ltd.
7 Woodshots Meadow,
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Analytical Report Number : 18-89714

Project / Site name:	Riverside MV	**Samples received on:**	21/06/2018
Your job number:	12236	**Samples instructed on:**	21/06/2018
Your order number:	12236-AF	**Analysis completed by:**	29/06/2018
Report Issue Number:	1	**Report issued on:**	29/06/2018
Samples Analysed:	7 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-89714

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				986111	986112	986113	986114	986115
Sample Reference				ES1	ES2	ES3	ES4	ES5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.50	1.00	0.30	1.30
Date Sampled				19/06/2018	19/06/2018	19/06/2018	19/06/2018	19/06/2018
Time Taken				0930	0945	0950	1100	1110
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	6.4	16	8.4	6.8	6.6
Total mass of sample received	kg	0.001	NONE	0.49	0.51	0.47	0.49	0.55
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.8	7.6	7.9	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	1600	770	1700	1100	1300
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.14	0.37	0.42	0.078	0.17
Sulphide	mg/kg	1	MCERTS	4.8	46	< 1.0	3.1	6.0
Total Sulphur	mg/kg	50	MCERTS	2000	4200	3600	3100	9400
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.6	5.7	6.5	3.2	2.4
Loss on Ignition @ 450°C	%	0.2	MCERTS	21.3	38.2	32.9	20.8	20.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	1.3	4.8	11	1.4	1.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.48	1.8	2.7	0.45	0.50
Fluorene	mg/kg	0.05	MCERTS	0.51	1.7	1.1	0.52	0.62
Phenanthrene	mg/kg	0.05	MCERTS	2.6	8.0	5.1	2.4	2.1
Anthracene	mg/kg	0.05	MCERTS	0.47	2.1	0.93	0.36	0.32
Fluoranthene	mg/kg	0.05	MCERTS	2.2	9.1	1.3	1.4	1.3
Pyrene	mg/kg	0.05	MCERTS	1.5	6.2	0.89	1.1	0.96
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.2	5.7	0.42	0.56	0.39
Chrysene	mg/kg	0.05	MCERTS	1.5	5.3	0.93	1.0	0.79
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.4	5.3	0.54	0.76	0.63
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.64	2.3	0.13	0.22	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.78	3.0	0.12	0.31	0.30
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.39	1.4	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.74	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.47	1.3	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	15.4	58.5	25.5	10.4	9.31
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	15	18	24	47
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.78	0.74	0.90	1.1	0.90
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.5	0.7	0.4	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	5.5	8.2	4.1	5.7	5.4
Copper (aqua regia extractable)	mg/kg	1	MCERTS	52	59	67	70	55
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	32	37	26	26
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	22	31	32	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	6.4	2.2	6.3	3.7	5.2
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	14	15	9.4	13	12
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	60	95	43	69	76

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Analytical Report Number: 18-89714

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				986111	986112	986113	986114	986115
Sample Reference				ES1	ES2	ES3	ES4	ES5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.50	1.00	0.30	1.30
Date Sampled				19/06/2018	19/06/2018	19/06/2018	19/06/2018	19/06/2018
Time Taken				0930	0945	0950	1100	1110
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.4	1.6	2.5	2.9	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	6.4	9.7	13	7.7	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	13	20	19	20	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	63	94	56	51	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	84	130	91	81	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	1.6	5.8	15	2.2	1.3
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	6.2	23	46	12	3.8
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	11	37	30	48	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	12	62	34	42	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	30	130	130	100	18

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Analytical Report Number: 18-89714

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				986116	986117			
Sample Reference				ES6	ES7			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.10	0.60			
Date Sampled				19/06/2018	19/06/2018			
Time Taken				1130	1135			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	7.2	9.9			
Total mass of sample received	kg	0.001	NONE	0.52	0.53			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	8.3			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	1300	1500			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.17	0.12			
Sulphide	mg/kg	1	MCERTS	16	7.7			
Total Sulphur	mg/kg	50	MCERTS	1300	1500			
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.0	3.4			
Loss on Ignition @ 450°C	%	0.2	MCERTS	12.8	17.7			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	1.4	3.1			
Acenaphthylene	mg/kg	0.05	MCERTS	0.29	0.54			
Acenaphthene	mg/kg	0.05	MCERTS	0.82	1.3			
Fluorene	mg/kg	0.05	MCERTS	0.97	1.6			
Phenanthrene	mg/kg	0.05	MCERTS	5.7	16			
Anthracene	mg/kg	0.05	MCERTS	1.3	2.0			
Fluoranthene	mg/kg	0.05	MCERTS	7.2	16			
Pyrene	mg/kg	0.05	MCERTS	5.4	11			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	4.6	5.6			
Chrysene	mg/kg	0.05	MCERTS	3.9	8.3			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.8	9.8			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	2.3	3.2			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.5	5.4			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.1	3.4			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.87	1.4			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.2	3.4			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	48.3	92.2			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	15			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.79	0.80			
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	0.6			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	12			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	42	46			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	37	32			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	24			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	19	18			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	79	93			

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Analytical Report Number: 18-89714

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				986116	986117			
Sample Reference				ES6	ES7			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.10	0.60			
Date Sampled				19/06/2018	19/06/2018			
Time Taken				1130	1135			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	2.5	2.4			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	9.5	6.4			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	24	22			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	140	110			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	180	140			

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.7	5.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	8.5	6.8			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	41	31			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	260	34			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	310	77			

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Analytical Report Number : 18-89714

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
986111	ES1	None Supplied	0.50	Grey clay and sand with gravel.
986112	ES2	None Supplied	1.50	Grey clay and sand with gravel.
986113	ES3	None Supplied	1.00	Grey clay and sand with gravel.
986114	ES4	None Supplied	0.30	Grey clay and sand with gravel.
986115	ES5	None Supplied	1.30	Grey clay and sand with gravel.
986116	ES6	None Supplied	0.10	Grey clay and sand with gravel.
986117	ES7	None Supplied	0.60	Grey clay and sand with gravel.

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Analytical Report Number : 18-89714

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-89714

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-90390

Project / Site name:	Riverside MV	**Samples received on:**	27/06/2018
Your job number:	12236	**Samples instructed on:**	27/06/2018
Your order number:	12236-AF	**Analysis completed by:**	05/07/2018
Report Issue Number:	1	**Report issued on:**	05/07/2018
Samples Analysed:	14 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-90390

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				989482	989483	989484	989485	989486
Sample Reference				TP4	TP4	TP5	TP5	TP6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	1.40	0.30	1.60	0.80
Date Sampled				25/06/2018	25/06/2018	25/06/2018	25/06/2018	25/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	14	-	-	< 0.1
Moisture Content	%	N/A	NONE	4.9	11	-	-	4.3
Total mass of sample received	kg	0.001	NONE	0.51	0.49	-	-	0.54
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.7	7.3	-	-	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	-	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	550	1000	-	-	710
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.053	0.081	-	-	0.12
Sulphide	mg/kg	1	MCERTS	< 1.0	16	-	-	2.2
Total Sulphur	mg/kg	50	MCERTS	1400	1800	-	-	1200
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.6	5.2	-	-	1.7
Loss on Ignition @ 450°C	%	0.2	MCERTS	16.7	30.5	-	-	12.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.64	0.73	-	-	1.3
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.43	-	-	0.21
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.41	-	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.5	3.1	-	-	1.5
Anthracene	mg/kg	0.05	MCERTS	0.16	0.63	-	-	0.11
Fluoranthene	mg/kg	0.05	MCERTS	1.0	3.4	-	-	0.41
Pyrene	mg/kg	0.05	MCERTS	0.83	2.6	-	-	0.26
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.62	2.0	-	-	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.95	2.5	-	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	2.7	-	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.1	-	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.6	-	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.94	-	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.31	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	1.1	-	-	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.73	23.6	-	-	3.74
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.2	3.9	-	-	14
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.99	0.91	-	-	0.90
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.7	-	-	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	5.8	9.2	-	-	3.6
Copper (aqua regia extractable)	mg/kg	1	MCERTS	51	64	-	-	41
Lead (aqua regia extractable)	mg/kg	1	MCERTS	37	38	-	-	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	25	-	-	36
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.3	< 1.0	-	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	11	16	-	-	9.5
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	83	77	-	-	66

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Analytical Report Number: 18-90390

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				989482	989483	989484	989485	989486
Sample Reference				TP4	TP4	TP5	TP5	TP6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	1.40	0.30	1.60	0.80
Date Sampled				25/06/2018	25/06/2018	25/06/2018	25/06/2018	25/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	4.8	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	16	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	29	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	95	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	140	-	-	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	3.7	-	-	1.8
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	3.9	17	-	-	4.3
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	38	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	76	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	13	130	-	-	19

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Analytical Report Number: 18-90390

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				989487	989488	989489	989490	989491
Sample Reference				TP6	TP7	TP7	TP8	TP8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.30	1.30	0.80	1.80
Date Sampled				25/06/2018	25/06/2018	25/06/2018	25/06/2018	25/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	-	-	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	24	-	-	5.5	7.9
Total mass of sample received	kg	0.001	NONE	0.41	-	-	0.51	0.53
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	-	-	8.0	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	5400	-	-	1900	830
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	-	-	0.36	0.24
Sulphide	mg/kg	1	MCERTS	< 1.0	-	-	1.1	1.8
Total Sulphur	mg/kg	50	MCERTS	3900	-	-	1500	550
Total Organic Carbon (TOC)	%	0.1	MCERTS	5.3	-	-	2.1	1.7
Loss on Ignition @ 450°C	%	0.2	MCERTS	25.1	-	-	18.6	9.9
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	4.0	-	-	1.1	0.66
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.68	-	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.60	-	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	3.6	-	-	1.2	1.0
Anthracene	mg/kg	0.05	MCERTS	0.51	-	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.6	-	-	0.36	0.58
Pyrene	mg/kg	0.05	MCERTS	1.1	-	-	0.25	0.40
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.76	-	-	0.25	0.46
Chrysene	mg/kg	0.05	MCERTS	1.0	-	-	0.20	0.34
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.96	-	-	< 0.05	0.38
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.38	-	-	< 0.05	0.16
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.45	-	-	< 0.05	0.23
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.23	-	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.27	-	-	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	16.2	-	-	3.38	4.21
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	35	-	-	12	6.6
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	-	-	0.96	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	-	-	1.0	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	-	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.2	-	-	4.8	7.0
Copper (aqua regia extractable)	mg/kg	1	MCERTS	94	-	-	53	39
Lead (aqua regia extractable)	mg/kg	1	MCERTS	51	-	-	18	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	47	-	-	32	43
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	3.1	-	-	3.3	2.7
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	17	-	-	12	18
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	89	-	-	64	65

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Analytical Report Number: 18-90390

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				989487	989488	989489	989490	989491
Sample Reference				TP6	TP7	TP7	TP8	TP8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.30	1.30	0.80	1.80
Date Sampled				25/06/2018	25/06/2018	25/06/2018	25/06/2018	25/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	4.4	-	-	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	35	-	-	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	83	-	-	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	320	-	-	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	440	-	-	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	7.9	-	-	1.8	1.7
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	31	-	-	3.4	6.5
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	51	-	-	< 10	11
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	93	-	-	< 10	21
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	180	-	-	18	40

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Analytical Report Number: 18-90390

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				989492	989493	989494	989495	
Sample Reference				TP9	TP9	TP10	TP10	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.40	1.40	0.30	1.30	
Date Sampled				25/06/2018	25/06/2018	25/06/2018	25/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	-	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	-	-	5.9	1.9	
Total mass of sample received	kg	0.001	NONE	-	-	0.52	0.52	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-	8.3	8.7	
Total Cyanide	mg/kg	1	MCERTS	-	-	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	750	740	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.077	0.055	
Sulphide	mg/kg	1	MCERTS	-	-	3.5	16	
Total Sulphur	mg/kg	50	MCERTS	-	-	1400	950	
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	2.2	1.7	
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	-	13.9	15.1	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	1.5	0.83	
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	-	-	0.25	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	-	-	0.30	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	-	-	2.0	0.66	
Anthracene	mg/kg	0.05	MCERTS	-	-	0.25	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	-	-	1.1	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	-	-	0.71	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	0.49	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	-	-	0.76	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.68	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.22	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	0.36	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	0.20	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	0.23	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	9.01	1.49	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	12	8.6	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	0.95	1.2	
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	1.2	1.4	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	7.7	5.5	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	56	50	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	20	16	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	32	32	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	1.5	4.9	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	14	11	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	68	61	

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Analytical Report Number: 18-90390

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				989492	989493	989494	989495	
Sample Reference				TP9	TP9	TP10	TP10	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.40	1.40	0.30	1.30	
Date Sampled				25/06/2018	25/06/2018	25/06/2018	25/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	3.3	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	8.6	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	16	< 8.0	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	28	< 10	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	4.1	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	13	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	17	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	27	< 10	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	61	< 10	

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Analytical Report Number : 18-90390

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
989482	TP4	None Supplied	0.40	Black loam and clay with vegetation and gravel
989483	TP4	None Supplied	1.40	Black sand with gravel and stones.
989484	TP5	None Supplied	0.30	-
989485	TP5	None Supplied	1.60	-
989486	TP6	None Supplied	0.80	Grey clay with gravel.
989487	TP6	None Supplied	1.80	Black clay and sand.
989488	TP7	None Supplied	0.30	-
989489	TP7	None Supplied	1.30	-
989490	TP8	None Supplied	0.80	Brown clay with gravel.
989491	TP8	None Supplied	1.80	Brown clay with gravel.
989492	TP9	None Supplied	0.40	-
989493	TP9	None Supplied	1.40	-
989494	TP10	None Supplied	0.30	Brown clay with gravel and vegetation.
989495	TP10	None Supplied	1.30	Light grey clay with vegetation.

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Analytical Report Number : 18-90390

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-90390

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-90451

Project / Site name:	Riverside MV	**Samples received on:**	27/06/2018
Your job number:	12236	**Samples instructed on:**	27/06/2018
Your order number:	12236/AF	**Analysis completed by:**	05/07/2018
Report Issue Number:	1	**Report issued on:**	05/07/2018
Samples Analysed:	16 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-90451

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				989800	989801	989802	989803	989804
Sample Reference				TP18	TP18	TP17	TP17	TP16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	1.25	0.30	1.30	0.20
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				0900	0900	0930	0930	1000
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	-	-	< 0.1
Moisture Content	%	N/A	NONE	6.7	9.8	-	-	6.9
Total mass of sample received	kg	0.001	NONE	0.45	0.50	-	-	0.50
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.7	8.2	-	-	10.1
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	-	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	2100	1500	-	-	1800
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.21	0.26	-	-	0.37
Sulphide	mg/kg	1	MCERTS	15	11	-	-	19
Total Sulphur	mg/kg	50	MCERTS	1800	2300	-	-	2200
Total Organic Carbon (TOC)	%	0.1	MCERTS	6.0	5.9	-	-	4.4
Loss on Ignition @ 450°C	%	0.2	MCERTS	26.6	29.3	-	-	19.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	1.7	4.4	-	-	2.4
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.25	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1.1	2.0	-	-	2.5
Fluorene	mg/kg	0.05	MCERTS	1.2	2.2	-	-	2.5
Phenanthrene	mg/kg	0.05	MCERTS	7.0	15	-	-	10
Anthracene	mg/kg	0.05	MCERTS	1.1	2.4	-	-	2.4
Fluoranthene	mg/kg	0.05	MCERTS	6.4	8.5	-	-	14
Pyrene	mg/kg	0.05	MCERTS	4.7	5.5	-	-	14
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.8	2.8	-	-	11
Chrysene	mg/kg	0.05	MCERTS	3.8	3.6	-	-	12
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.7	3.2	-	-	12
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.6	1.7	-	-	6.6
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.9	1.7	-	-	7.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	1.1	-	-	4.0
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	1.4
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	1.0	-	-	4.4
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	39.2	54.9	-	-	108
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	15	-	-	1.5
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.67	0.67	-	-	0.50
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	0.8	-	-	2.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	80	-	-	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	51	60	-	-	45
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	50	-	-	29
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.7	< 0.3	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	39	-	-	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	5.1	< 1.0	-	-	1.5
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	24	130	-	-	20
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	220	-	-	50

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Analytical Report Number: 18-90451

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				989800	989801	989802	989803	989804
Sample Reference				TP18	TP18	TP17	TP17	TP16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	1.25	0.30	1.30	0.20
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				0900	0900	0930	0930	1000
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	13	4.9	-	-	9.7
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	32	17	-	-	220
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	68	84	-	-	410
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	410	730	-	-	430
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	530	840	-	-	1100
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	11	6.4	-	-	17
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	40	15	-	-	140
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	100	74	-	-	200
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	440	390	-	-	210
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	600	480	-	-	570

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Analytical Report Number: 18-90451

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				989805	989806	989807	989808	989809
Sample Reference				TP16	TP15	TP15	TP14	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.30	0.70	0.35	1.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				1000	1030	1030	1100	1100
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	-	-	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	26	-	-	3.8	23
Total mass of sample received	kg	0.001	NONE	0.47	-	-	0.52	0.46
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile & Crocidolite	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001	-	-	0.006
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001	-	-	0.006
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.6	-	-	8.6	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	930	-	-	740	890
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.060	-	-	0.10	0.10
Sulphide	mg/kg	1	MCERTS	1.2	-	-	8.7	8.4
Total Sulphur	mg/kg	50	MCERTS	1200	-	-	780	1800
Total Organic Carbon (TOC)	%	0.1	MCERTS	7.2	-	-	3.9	8.0
Loss on Ignition @ 450°C	%	0.2	MCERTS	32.6	-	-	13.3	38.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	1.4	-	-	1.1	13
Acenaphthylene	mg/kg	0.05	MCERTS	0.15	-	-	0.19	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	2.2	-	-	1.9	34
Fluorene	mg/kg	0.05	MCERTS	2.1	-	-	1.5	43
Phenanthrene	mg/kg	0.05	MCERTS	7.3	-	-	8.5	74
Anthracene	mg/kg	0.05	MCERTS	2.0	-	-	2.3	15
Fluoranthene	mg/kg	0.05	MCERTS	12	-	-	13	77
Pyrene	mg/kg	0.05	MCERTS	9.0	-	-	9.1	52
Benzo(a)anthracene	mg/kg	0.05	MCERTS	5.0	-	-	7.8	15
Chrysene	mg/kg	0.05	MCERTS	5.8	-	-	8.1	11
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.2	-	-	8.2	7.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.7	-	-	4.6	4.5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.6	-	-	5.2	5.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.0	-	-	2.7	1.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.68	-	-	0.92	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.0	-	-	2.8	1.9
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	64.1	-	-	77.5	355
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	22	-	-	18	19
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	-	-	0.73	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	1.9	-	-	0.5	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	-	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	-	-	12	10
Copper (aqua regia extractable)	mg/kg	1	MCERTS	79	-	-	51	100
Lead (aqua regia extractable)	mg/kg	1	MCERTS	76	-	-	34	72
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.0	-	-	1.2	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	35	-	-	22	35
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	19	-	-	19	20
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	-	-	66	94

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Analytical Report Number: 18-90451

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				989805	989806	989807	989808	989809
Sample Reference				TP16	TP15	TP15	TP14	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.30	0.70	0.35	1.00
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				1000	1030	1030	1100	1100
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	6.5	-	-	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	23	-	-	< 2.0	36
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	81	-	-	< 8.0	420
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	170	-	-	< 8.0	250
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	280	-	-	< 10	710
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.7	-	-	3.6	18
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	26	-	-	15	260
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	130	-	-	61	1800
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	120	-	-	120	390
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	270	-	-	200	2500

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Analytical Report Number: 18-90451

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				989810	989811	989812	989813	989814
Sample Reference				TP13	TP13	TP12	TP12	TP11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.80	0.20	1.00	0.30
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				1130	1130	1150	1150	1200
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	-	< 0.1	< 0.1	-
Moisture Content	%	N/A	NONE	-	-	1.6	3.4	-
Total mass of sample received	kg	0.001	NONE	-	-	0.45	0.45	-
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-	6.9	7.3	-
Total Cyanide	mg/kg	1	MCERTS	-	-	< 1	< 1	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	1300	970	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.18	0.17	-
Sulphide	mg/kg	1	MCERTS	-	-	1.9	3.3	-
Total Sulphur	mg/kg	50	MCERTS	-	-	4800	1400	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	4.2	3.0	-
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	-	15.9	20.5	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	0.58	1.3	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.14	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	0.37	2.8	-
Fluorene	mg/kg	0.05	MCERTS	-	-	0.44	4.9	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	1.9	9.6	-
Anthracene	mg/kg	0.05	MCERTS	-	-	0.33	2.9	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	1.9	18	-
Pyrene	mg/kg	0.05	MCERTS	-	-	1.4	14	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	0.62	3.8	-
Chrysene	mg/kg	0.05	MCERTS	-	-	1.1	3.7	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.76	1.7	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.33	0.88	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	0.45	1.0	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.24	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.23	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	10.0	65.3	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	8.2	14	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	0.93	0.96	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	0.8	0.4	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	< 4.0	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	12	7.1	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	54	57	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	30	24	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	0.8	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	38	28	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	2.5	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	23	11	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	71	74	-

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Analytical Report Number: 18-90451

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				989810	989811	989812	989813	989814
Sample Reference				TP13	TP13	TP12	TP12	TP11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.80	0.20	1.00	0.30
Date Sampled				26/06/2018	26/06/2018	26/06/2018	26/06/2018	26/06/2018
Time Taken				1130	1130	1150	1150	1200
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	1.6	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	4.9	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	< 8.0	32	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	< 8.0	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	< 10	41	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	3.9	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	40	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	< 10	260	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	< 10	84	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	< 10	380	-

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Analytical Report Number: 18-90451

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				989815				
Sample Reference				TP11				
Sample Number				None Supplied				
Depth (m)				0.80				
Date Sampled				26/06/2018				
Time Taken				1200				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-				
Moisture Content	%	N/A	NONE	-				
Total mass of sample received	kg	0.001	NONE	-				
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-				
Asbestos Quantification Total	%	0.001	ISO 17025	-				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-				
Total Cyanide	mg/kg	1	MCERTS	-				
Total Sulphate as SO_4	mg/kg	50	MCERTS	-				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-				
Sulphide	mg/kg	1	MCERTS	-				
Total Sulphur	mg/kg	50	MCERTS	-				
Total Organic Carbon (TOC)	%	0.1	MCERTS	-				
Loss on Ignition @ 450°C	%	0.2	MCERTS	-				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-				
Acenaphthylene	mg/kg	0.05	MCERTS	-				
Acenaphthene	mg/kg	0.05	MCERTS	-				
Fluorene	mg/kg	0.05	MCERTS	-				
Phenanthrene	mg/kg	0.05	MCERTS	-				
Anthracene	mg/kg	0.05	MCERTS	-				
Fluoranthene	mg/kg	0.05	MCERTS	-				
Pyrene	mg/kg	0.05	MCERTS	-				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-				
Chrysene	mg/kg	0.05	MCERTS	-				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-				
Boron (water soluble)	mg/kg	0.2	MCERTS	-				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-				
Chromium (hexavalent)	mg/kg	4	MCERTS	-				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-				

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Analytical Report Number: 18-90451

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				989815				
Sample Reference				TP11				
Sample Number				None Supplied				
Depth (m)				0.80				
Date Sampled				26/06/2018				
Time Taken				1200				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-				
Toluene	µg/kg	1	MCERTS	-				
Ethylbenzene	µg/kg	1	MCERTS	-				
p & m-xylene	µg/kg	1	MCERTS	-				
o-xylene	µg/kg	1	MCERTS	-				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-				

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Analytical Report Number: 18-90451
Project / Site name: Riverside MV
Your Order No: 12236/AF

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
989801	TP18	1.25	166	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
989805	TP16	1.00	142	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
989806	TP15	0.30	160	Loose Fibres	**Chrysotile & Crocidolite**	< 0.001	**< 0.001**
989809	TP14	1.00	125	Loose Fibrous Debris	**Chrysotile**	0.006	**0.006**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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Analytical Report Number : 18-90451

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
989800	TP18	None Supplied	0.25	Black clay and sand with gravel.
989801	TP18	None Supplied	1.25	Black clay and sand with gravel.
989802	TP17	None Supplied	0.30	-
989803	TP17	None Supplied	1.30	-
989804	TP16	None Supplied	0.20	Black clay and sand with gravel.
989805	TP16	None Supplied	1.00	Black clay and sand with gravel.
989806	TP15	None Supplied	0.30	-
989807	TP15	None Supplied	0.70	-
989808	TP14	None Supplied	0.35	Black loam and sand with gravel.
989809	TP14	None Supplied	1.00	Black clay and sand with gravel.
989810	TP13	None Supplied	0.20	-
989811	TP13	None Supplied	0.80	-
989812	TP12	None Supplied	0.20	Grey loam and sand with gravel.
989813	TP12	None Supplied	1.00	Black clay and sand with gravel.
989814	TP11	None Supplied	0.30	-
989815	TP11	None Supplied	0.80	-

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Analytical Report Number : 18-90451

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

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Analytical Report Number : 18-90451

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-90991

Replaces Analytical Report Number : 18-90991, issue no. 1

Project / Site name:	Riverside MV	**Samples received on:**	02/07/2018
Your job number:	12236	**Samples instructed on:**	02/07/2018
Your order number:	12236-AF	**Analysis completed by:**	20/07/2018
Report Issue Number:	2	**Report issued on:**	20/07/2018
Samples Analysed:	24 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992795	992796	992797	992798	992799
Sample Reference				TP19	TP19	TP20	TP20	TP21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.70	0.30	1.10	0.20
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	-	< 0.1	< 0.1	-
Moisture Content	%	N/A	NONE	-	-	9.6	9.7	-
Total mass of sample received	kg	0.001	NONE	-	-	0.48	0.48	-
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification (Stage 3)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total (stages 2+3)	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-	7.9	7.7	-
Total Cyanide	mg/kg	1	MCERTS	-	-	< 1	< 1	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	1200	1300	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.033	0.055	-
Sulphide	mg/kg	1	MCERTS	-	-	11	25	-
Total Sulphur	mg/kg	50	MCERTS	-	-	1300	1400	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	5.1	4.4	-
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	-	17.9	17.9	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	1.4	1.8	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	0.18	0.40	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	0.96	3.9	-
Fluorene	mg/kg	0.05	MCERTS	-	-	0.92	4.2	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	6.2	22	-
Anthracene	mg/kg	0.05	MCERTS	-	-	1.7	7.0	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	8.2	36	-
Pyrene	mg/kg	0.05	MCERTS	-	-	5.8	27	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	4.6	24	-
Chrysene	mg/kg	0.05	MCERTS	-	-	5.9	20	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	8.5	30	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	1.8	13	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	4.3	19	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	2.9	10	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	1.1	4.5	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	2.6	10	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	56.8	232	-

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992795	992796	992797	992798	992799
Sample Reference				TP19	TP19	TP20	TP20	TP21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.70	0.30	1.10	0.20
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	15	15	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	0.81	1.1	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	1.0	0.8	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	< 4.0	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	17	20	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	77	88	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	79	64	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	30	30	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	2.3	2.3	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	29	43	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	94	92	-
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	1.7	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	11	8.3	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	51	36	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	300	150	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	360	190	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	6.3	2.5	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	26	29	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	110	160	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	290	330	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	430	510	-

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992800	992801	992802	992803	992804
Sample Reference				TP21	TP22	TP22	TP23	TP23
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.50	1.20	0.20	1.00
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	< 0.1	< 0.1	-	-
Moisture Content	%	N/A	NONE	-	4.2	26	-	-
Total mass of sample received	kg	0.001	NONE	-	0.45	0.46	-	-
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification (Stage 3)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total (stages 2+3)	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	8.1	8.1	-	-
Total Cyanide	mg/kg	1	MCERTS	-	< 1	< 1	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	850	2000	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.043	0.059	-	-
Sulphide	mg/kg	1	MCERTS	-	2.2	< 1.0	-	-
Total Sulphur	mg/kg	50	MCERTS	-	820	1200	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	5.2	8.4	-	-
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	26.7	38.6	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	1.4	3.2	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	0.18	0.15	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	0.97	1.6	-	-
Fluorene	mg/kg	0.05	MCERTS	-	0.88	1.6	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	4.5	7.5	-	-
Anthracene	mg/kg	0.05	MCERTS	-	1.1	1.4	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	5.4	5.6	-	-
Pyrene	mg/kg	0.05	MCERTS	-	4.1	4.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	3.2	2.3	-	-
Chrysene	mg/kg	0.05	MCERTS	-	3.1	3.2	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	4.4	3.9	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	1.7	1.1	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	2.5	1.8	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	1.5	1.2	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.64	0.50	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	1.5	1.2	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	37.2	40.5	-	-

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992800	992801	992802	992803	992804
Sample Reference				TP21	TP22	TP22	TP23	TP23
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.50	1.20	0.20	1.00
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	12	25	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.94	1.0	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1.0	0.7	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0	< 4.0	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	10	12	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	70	63	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	48	85	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	31	45	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	2.7	3.1	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	18	20	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	100	71	-	-
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	1.4	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	5.5	4.6	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	27	15	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	110	8.6	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	140	29	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	4.5	4.2	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	13	12	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	57	33	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	100	32	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	180	82	-	-

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992805	992806	992807	992808	992809
Sample Reference				TP24	TP24	TP25	TP25	TP26
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.20	0.50	1.00	0.30
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	-	-	< 0.1
Moisture Content	%	N/A	NONE	4.0	7.6	-	-	10
Total mass of sample received	kg	0.001	NONE	0.50	0.50	-	-	0.46
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification (Stage 3)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total (stages 2+3)	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.8	8.4	-	-	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	-	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	1000	840	-	-	510
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.060	0.042	-	-	0.017
Sulphide	mg/kg	1	MCERTS	6.1	6.2	-	-	1.2
Total Sulphur	mg/kg	50	MCERTS	1500	550	-	-	380
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.2	3.3	-	-	5.5
Loss on Ignition @ 450°C	%	0.2	MCERTS	17.8	27.0	-	-	25.5
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	1.6	1.8	-	-	0.80
Acenaphthylene	mg/kg	0.05	MCERTS	0.12	< 0.05	-	-	0.13
Acenaphthene	mg/kg	0.05	MCERTS	0.95	0.39	-	-	0.23
Fluorene	mg/kg	0.05	MCERTS	0.68	0.29	-	-	0.22
Phenanthrene	mg/kg	0.05	MCERTS	5.3	2.4	-	-	2.7
Anthracene	mg/kg	0.05	MCERTS	1.2	0.42	-	-	0.54
Fluoranthene	mg/kg	0.05	MCERTS	5.7	1.5	-	-	3.6
Pyrene	mg/kg	0.05	MCERTS	3.9	1.0	-	-	2.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.9	0.58	-	-	2.0
Chrysene	mg/kg	0.05	MCERTS	3.9	0.87	-	-	2.7
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.8	0.93	-	-	3.8
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.5	0.43	-	-	0.94
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.2	0.54	-	-	2.0
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.1	0.36	-	-	1.3
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.74	0.14	-	-	0.51
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.2	0.36	-	-	1.3
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	42.5	12.0	-	-	25.6

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992805	992806	992807	992808	992809
Sample Reference				TP24	TP24	TP25	TP25	TP26
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.20	0.50	1.00	0.30
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	6.1	-	-	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.66	0.50	-	-	0.82
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.5	-	-	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	< 0.2	-	-	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	13	-	-	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	54	40	-	-	71
Lead (aqua regia extractable)	mg/kg	1	MCERTS	71	24	-	-	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	< 0.3	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	12	-	-	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	2.3	-	-	1.9
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33	21	-	-	20
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	53	-	-	91
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	2.9	< 1.0	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	8.4	2.4	-	-	3.2
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	23	17	-	-	19
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	93	36	-	-	56
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	130	56	-	-	78
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.1	4.0	-	-	7.7
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	5.5	11	-	-	15
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	20	37	-	-	59
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	37	60	-	-	140
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	65	110	-	-	220

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992810	992811	992812	992813	992814
Sample Reference				TP26	TP27	TP27	TP28	TP28
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	0.10-.	0.80	0.25	0.75
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	-	-	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	-	-	6.1	11
Total mass of sample received	kg	0.001	NONE	0.52	-	-	0.46	0.47
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Crocidolite	-	Chrysotile	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	0.001	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	0.001	< 0.001
Asbestos Quantification (Stage 3)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total (stages 2+3)	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	-	-	8.1	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	280	-	-	1000	960
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.024	-	-	0.026	0.049
Sulphide	mg/kg	1	MCERTS	< 1.0	-	-	9.1	30
Total Sulphur	mg/kg	50	MCERTS	320	-	-	860	1500
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.5	-	-	5.6	5.2
Loss on Ignition @ 450°C	%	0.2	MCERTS	4.4	-	-	25.9	26.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	1.7	1.2
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	0.16	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	0.95	1.0
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	0.89	0.95
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	-	6.0	4.3
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	1.2	0.94
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	7.5	5.3
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	5.6	4.0
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	4.6	2.6
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	4.1	3.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	7.0	3.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	1.8	2.0
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	3.4	2.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	2.2	1.4
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	0.85	0.54
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	2.0	1.4
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	-	-	50.1	35.0

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992810	992811	992812	992813	992814
Sample Reference				TP26	TP27	TP27	TP28	TP28
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	0.10-.	0.80	0.25	0.75
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2	-	-	19	21
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.68	-	-	0.94	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	-	-	0.7	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	-	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	-	-	16	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	38	-	-	110	89
Lead (aqua regia extractable)	mg/kg	1	MCERTS	17	-	-	70	75
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	-	-	32	33
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	1.6	2.9
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	17	-	-	24	34
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	80	-	-	130	90
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	1.4
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	4.5	11
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	24	49
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	100	240
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	130	300
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	2.3	12
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	15	33
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	71	120
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	-	-	150	230
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	240	400

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992815	992816	992817	992818	
Sample Reference				TP29	TP29	TP30	TP30	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.20	0.70	0.30	1.30	
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	-	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	-	-	6.1	23	
Total mass of sample received	kg	0.001	NONE	-	-	0.42	0.41	
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite	Chrysotile & Amosite	-	-	
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected	Not-detected	
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.002	0.083	-	-	
Asbestos Quantification Total	%	0.001	ISO 17025	0.002	0.083	-	-	
Asbestos Quantification (Stage 3)	%	0.001	ISO 17025	-	< 0.001	-	-	
Asbestos Quantification Total (stages 2+3)	%	0.001	ISO 17025	-	0.083	-	-	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-	7.9	8.2	
Total Cyanide	mg/kg	1	MCERTS	-	-	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	1100	1100	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.026	0.036	
Sulphide	mg/kg	1	MCERTS	-	-	7.2	11	
Total Sulphur	mg/kg	50	MCERTS	-	-	1100	840	
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	7.2	5.9	
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	-	33.8	21.7	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	3.0	0.64	
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	0.18	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	-	-	0.82	0.17	
Fluorene	mg/kg	0.05	MCERTS	-	-	1.1	0.20	
Phenanthrene	mg/kg	0.05	MCERTS	-	-	6.8	1.5	
Anthracene	mg/kg	0.05	MCERTS	-	-	1.4	0.21	
Fluoranthene	mg/kg	0.05	MCERTS	-	-	6.3	0.86	
Pyrene	mg/kg	0.05	MCERTS	-	-	4.4	0.56	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	3.0	0.38	
Chrysene	mg/kg	0.05	MCERTS	-	-	4.3	0.75	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	5.3	0.73	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	1.5	0.25	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	2.7	0.38	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	1.9	0.25	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	0.71	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	1.9	0.30	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	45.4	7.13	

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Analytical Report Number: 18-90991

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992815	992816	992817	992818	
Sample Reference				TP29	TP29	TP30	TP30	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.20	0.70	0.30	1.30	
Date Sampled				27/06/2018	27/06/2018	27/06/2018	27/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	15	18	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	0.94	0.92	
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	1.0	0.6	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	15	9.6	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	78	53	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	57	73	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	29	35	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	2.6	1.8	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	26	24	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	130	49	
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	2.5	1.5	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	6.8	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	28	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	190	31	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	230	38	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	3.7	1.2	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	17	2.7	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	73	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	200	< 10	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	300	18	

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90991
Project / Site name: Riverside MV
Your Order No: 12236-AF

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
992811	TP27	0.10-.	170	Loose Fibres	**Crocidolite**	< 0.001	**< 0.001**
992813	TP28	0.25	191	Loose Fibres	**Chrysotile**	0.001	**0.001**
992814	TP28	0.75	171	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
992815	TP29	0.20	176	Loose Fibres	**Chrysotile & Amosite**	0.002	**0.002**
992816	TP29	0.70	179	Loose Fibrous Debris	**Chrysotile & Amosite**	0.083	**0.083**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Numbe **18-90991**
Project / Site name: **Riverside MV**
Your Order No: **12236-AF**

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

"The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by Gravimetric (Stage 2) Method (%)	Asbestos by PCM (stage 3) Method (%)	Total % Asbestos in Sample
992816	TP29	0.70	179	Loose Fibrous Debris	**Chrysotile & Amosite**	0.083	< 0.001	**0.083**

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Analytical Report Number : 18-90991

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
992795	TP19	None Supplied	0.10	-
992796	TP19	None Supplied	0.70	-
992797	TP20	None Supplied	0.30	Grey loam and sand with gravel and vegetation.
992798	TP20	None Supplied	1.10	Grey loam and sand with gravel and vegetation.
992799	TP21	None Supplied	0.20	-
992800	TP21	None Supplied	0.80	-
992801	TP22	None Supplied	0.50	Grey loam and sand with gravel.
992802	TP22	None Supplied	1.20	Grey clay and sand.
992803	TP23	None Supplied	0.20	-
992804	TP23	None Supplied	1.00	-
992805	TP24	None Supplied	0.30	Grey sand with gravel.
992806	TP24	None Supplied	1.20	Brown sand with gravel.
992807	TP25	None Supplied	0.50	-
992808	TP25	None Supplied	1.00	-
992809	TP26	None Supplied	0.30	Grey clay and sand with gravel.
992810	TP26	None Supplied	1.20	Brown clay.
992811	TP27	None Supplied	0.10-.	-
992812	TP27	None Supplied	0.80	-
992813	TP28	None Supplied	0.25	Brown loam and sand with gravel and vegetation.
992814	TP28	None Supplied	0.75	Grey clay and sand with gravel.
992815	TP29	None Supplied	0.20	-
992816	TP29	None Supplied	0.70	-
992817	TP30	None Supplied	0.30	Brown loam and sand with gravel and vegetation.
992818	TP30	None Supplied	1.30	Grey clay and sand with gravel.

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Analytical Report Number : 18-90991

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Asbestos Quantification - PCOM	Asbestos quantification by PCOM and fibre counting method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

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Analytical Report Number : 18-90991

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-91596

Project / Site name:	Riverside MV	**Samples received on:**	05/07/2018
Your job number:	12236	**Samples instructed on:**	05/07/2018
Your order number:	12236-AF	**Analysis completed by:**	16/07/2018
Report Issue Number:	1	**Report issued on:**	16/07/2018
Samples Analysed:	18 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-91596

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995948	995949	995950	995951	995952
Sample Reference				TP31	TP31	TP32	TP32	TP33
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.80	0.20	1.00	0.30
Date Sampled				03/07/2018	03/07/2018	04/07/2018	04/07/2018	03/07/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	-	< 0.1	< 0.1	-
Moisture Content	%	N/A	NONE	-	-	4.6	12	-
Total mass of sample received	kg	0.001	NONE	-	-	0.52	0.47	-
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Chrysotile & Amosite & Crocidolite	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	0.965	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	0.965	< 0.001
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-	8.9	8.6	-
Total Cyanide	mg/kg	1	MCERTS	-	-	< 1	< 1	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	560	1600	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.036	0.22	-
Sulphide	mg/kg	1	MCERTS	-	-	10	140	-
Total Sulphur	mg/kg	50	MCERTS	-	-	420	2000	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	1.5	5.5	-
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	-	6.7	18.5	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	0.53	1.4	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.12	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	0.14	0.45	-
Fluorene	mg/kg	0.05	MCERTS	-	-	0.16	0.45	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	1.2	4.7	-
Anthracene	mg/kg	0.05	MCERTS	-	-	0.17	0.66	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	0.88	4.7	-
Pyrene	mg/kg	0.05	MCERTS	-	-	0.61	3.3	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	0.46	2.6	-
Chrysene	mg/kg	0.05	MCERTS	-	-	0.79	3.7	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.76	3.7	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.33	2.2	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	0.39	2.5	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	0.30	1.5	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	0.31	1.7	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	7.02	33.6	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	5.3	13	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	0.52	1.5	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	1.0	1.1	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	< 4.0	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	9.1	21	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	18	56	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	16	64	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	14	25	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	2.5	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	15	38	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	47	140	-

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Analytical Report Number: 18-91596

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995948	995949	995950	995951	995952
Sample Reference				TP31	TP31	TP32	TP32	TP33
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.80	0.20	1.00	0.30
Date Sampled				03/07/2018	03/07/2018	04/07/2018	04/07/2018	03/07/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	2.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	13	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	< 8.0	47	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	< 8.0	310	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	< 10	370	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	7.4	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	30	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	< 10	110	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	< 10	390	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	< 10	540	-

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Analytical Report Number: 18-91596

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995953	995954	995955	995956	995957
Sample Reference				TP33	TP34	TP34	TP35	TP35
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.10	0.90	0.50	1.30
Date Sampled				03/07/2018	04/07/2018	04/07/2018	03/07/2018	03/07/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	< 0.1	< 0.1	-	-
Moisture Content	%	N/A	NONE	-	9.2	7.4	-	-
Total mass of sample received	kg	0.001	NONE	-	0.49	0.52	-	-
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite	Chrysotile	Chrysotile & Amosite	Chrysotile & Amosite	Chrysotile & Crocidolite
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.001	< 0.001	0.005	0.001	0.003
Asbestos Quantification Total	%	0.001	ISO 17025	0.001	< 0.001	0.005	0.001	0.003
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	8.6	8.7	-	-
Total Cyanide	mg/kg	1	MCERTS	-	< 1	< 1	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	1000	790	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.056	0.096	-	-
Sulphide	mg/kg	1	MCERTS	-	17	55	-	-
Total Sulphur	mg/kg	50	MCERTS	-	960	1200	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	3.3	2.7	-	-
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	19.2	12.0	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	1.8	1.4	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	0.16	0.17	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	3.7	3.7	-	-
Fluorene	mg/kg	0.05	MCERTS	-	2.5	3.0	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	16	13	-	-
Anthracene	mg/kg	0.05	MCERTS	-	3.6	3.6	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	17	18	-	-
Pyrene	mg/kg	0.05	MCERTS	-	12	13	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	10	12	-	-
Chrysene	mg/kg	0.05	MCERTS	-	12	14	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	13	16	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	6.1	7.8	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	9.2	12	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	5.5	6.9	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	1.9	2.1	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	5.8	7.5	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	121	133	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	9.9	11	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.88	0.85	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1.2	1.5	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	0.5	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0	< 4.0	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	13	16	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	45	55	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	33	60	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	27	20	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	1.9	1.0	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	20	25	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	79	120	-	-

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Analytical Report Number: 18-91596

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995953	995954	995955	995956	995957
Sample Reference				TP33	TP34	TP34	TP35	TP35
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	0.10	0.90	0.50	1.30
Date Sampled				03/07/2018	04/07/2018	04/07/2018	03/07/2018	03/07/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	2.5	2.9	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	8.8	14	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	25	88	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	150	330	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	190	430	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	4.2	1.9	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	28	33	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	120	180	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	190	420	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	340	630	-	-

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Analytical Report Number: 18-91596

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995958	995959	995960	995961	995962
Sample Reference				TP36	TP36	TP37	TP37	TP38
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	1.00	0.50	1.50	0.30
Date Sampled				04/07/2018	04/07/2018	03/07/2018	03/07/2018	04/07/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	-	-	< 0.1
Moisture Content	%	N/A	NONE	9.5	7.5	-	-	1.9
Total mass of sample received	kg	0.001	NONE	1.0	0.54	-	-	0.48
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.003	-	-	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	0.003	-	-	< 0.001	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	8.6	-	-	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	-	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	1300	1400	-	-	1100
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.13	0.35	-	-	0.046
Sulphide	mg/kg	1	MCERTS	4.7	7.2	-	-	23
Total Sulphur	mg/kg	50	MCERTS	1300	1000	-	-	1100
Total Organic Carbon (TOC)	%	0.1	MCERTS	4.5	3.5	-	-	3.1
Loss on Ignition @ 450°C	%	0.2	MCERTS	22.2	19.0	-	-	10.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	3.1	2.3	-	-	0.75
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1.2	0.78	-	-	1.0
Fluorene	mg/kg	0.05	MCERTS	1.2	0.94	-	-	1.2
Phenanthrene	mg/kg	0.05	MCERTS	6.4	4.9	-	-	7.7
Anthracene	mg/kg	0.05	MCERTS	1.0	1.0	-	-	1.8
Fluoranthene	mg/kg	0.05	MCERTS	4.6	4.7	-	-	12
Pyrene	mg/kg	0.05	MCERTS	3.3	3.4	-	-	8.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.9	2.5	-	-	7.7
Chrysene	mg/kg	0.05	MCERTS	2.8	3.1	-	-	7.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.4	2.9	-	-	7.9
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.3	1.8	-	-	4.8
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.5	2.2	-	-	5.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.0	1.3	-	-	2.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	1.0
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.1	1.5	-	-	3.0
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	32.7	33.3	-	-	73.3
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	11	-	-	9.0
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.0	-	-	0.80
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7	2.4	-	-	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	11	-	-	9.0
Copper (aqua regia extractable)	mg/kg	1	MCERTS	55	51	-	-	43
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	54	-	-	26
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32	32	-	-	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.5	1.2	-	-	2.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20	20	-	-	15
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	85	92	-	-	53

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Analytical Report Number: 18-91596

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995958	995959	995960	995961	995962
Sample Reference				TP36	TP36	TP37	TP37	TP38
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	1.00	0.50	1.50	0.30
Date Sampled				04/07/2018	04/07/2018	03/07/2018	03/07/2018	04/07/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	4.9	< 1.0	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	22	5.4	-	-	12
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	55	21	-	-	20
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	180	95	-	-	95
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	260	120	-	-	130
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	4.6	2.8	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	27	13	-	-	6.4
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	87	54	-	-	42
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	130	110	-	-	87
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	250	180	-	-	130

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Analytical Report Number: 18-91596

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995963	995964	995965		
Sample Reference				TP38	TP39	TP39		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				1.30	0.10	1.00		
Date Sampled				04/07/2018	03/07/2018	03/07/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	-	-		
Moisture Content	%	N/A	NONE	12	-	-		
Total mass of sample received	kg	0.001	NONE	0.52	-	-		
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile & Crocidolite	-		
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected		
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.014	< 0.001	-		
Asbestos Quantification Total	%	0.001	ISO 17025	0.014	< 0.001	-		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	-	-		
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-		
Total Sulphate as SO_4	mg/kg	50	MCERTS	960	-	-		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.026	-	-		
Sulphide	mg/kg	1	MCERTS	63	-	-		
Total Sulphur	mg/kg	50	MCERTS	1300	-	-		
Total Organic Carbon (TOC)	%	0.1	MCERTS	4.1	-	-		
Loss on Ignition @ 450°C	%	0.2	MCERTS	17.4	-	-		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.79	-	-		
Acenaphthylene	mg/kg	0.05	MCERTS	0.19	-	-		
Acenaphthene	mg/kg	0.05	MCERTS	1.9	-	-		
Fluorene	mg/kg	0.05	MCERTS	1.7	-	-		
Phenanthrene	mg/kg	0.05	MCERTS	12	-	-		
Anthracene	mg/kg	0.05	MCERTS	3.4	-	-		
Fluoranthene	mg/kg	0.05	MCERTS	26	-	-		
Pyrene	mg/kg	0.05	MCERTS	19	-	-		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	17	-	-		
Chrysene	mg/kg	0.05	MCERTS	15	-	-		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	18	-	-		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	8.1	-	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	12	-	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	6.0	-	-		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.2	-	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	6.3	-	-		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	151	-	-		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	-	-		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	-	-		
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	-	-		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	-		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	-	-		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	55	-	-		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	40	-	-		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	-	-		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.5	-	-		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	31	-	-		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	70	-	-		

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Analytical Report Number: 18-91596

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995963	995964	995965		
Sample Reference				TP38	TP39	TP39		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				1.30	0.10	1.00		
Date Sampled				04/07/2018	03/07/2018	03/07/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	-		
Toluene	µg/kg	1	MCERTS	< 1.0	-	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-		
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	4.2	-	-		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	17	-	-		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	36	-	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	170	-	-		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	230	-	-		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	10	-	-		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	78	-	-		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	150	-	-		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	230	-	-		

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Analytical Report Number: 18-91596
Project / Site name: Riverside MV
Your Order No: 12236-AF

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
995951	TP32	1.00	135	Loose Fibrous Debris	**Chrysotile & Amosite & Crocidolite**	0.965	**0.965**
995952	TP33	0.30	181	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
995953	TP33	1.30	147	Loose Fibres	**Chrysotile & Amosite**	0.001	**0.001**
995954	TP34	0.10	161	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
995955	TP34	0.90	167	Loose Fibres	**Chrysotile & Amosite**	0.005	**0.005**
995956	TP35	0.50	216	Loose Fibres	**Chrysotile & Amosite**	0.001	**0.001**
995957	TP35	1.30	105	Loose Fibres	**Chrysotile & Crocidolite**	0.003	**0.003**
995958	TP36	0.25	105	Loose Fibres	**Chrysotile**	0.003	**0.003**
995961	TP37	1.50	177	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
995963	TP38	1.30	190	Sheeting/Board Debris	**Chrysotile**	0.014	**0.014**
995964	TP39	0.10	188	Loose Fibres	**Chrysotile & Crocidolite**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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Analytical Report Number : 18-91596

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
995948	TP31	None Supplied	0.30	-
995949	TP31	None Supplied	0.80	-
995950	TP32	None Supplied	0.20	Brown loam and sand with gravel.
995951	TP32	None Supplied	1.00	Black loam and sand with gravel.
995952	TP33	None Supplied	0.30	-
995953	TP33	None Supplied	1.30	-
995954	TP34	None Supplied	0.10	Black loam and sand with gravel.
995955	TP34	None Supplied	0.90	Brown loam and sand with gravel.
995956	TP35	None Supplied	0.50	-
995957	TP35	None Supplied	1.30	-
995958	TP36	None Supplied	0.25	Black loam and clay with gravel.
995959	TP36	None Supplied	1.00	Black loam and sand with gravel.
995960	TP37	None Supplied	0.50	-
995961	TP37	None Supplied	1.50	-
995962	TP38	None Supplied	0.30	Grey loam and sand with gravel.
995963	TP38	None Supplied	1.30	Black clay and sand with gravel.
995964	TP39	None Supplied	0.10	-
995965	TP39	None Supplied	1.00	-

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Analytical Report Number : 18-91596

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

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Analytical Report Number : 18-91596

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-93033

Project / Site name:	Riverside MV	**Samples received on:**	19/07/2018
Your job number:	12236	**Samples instructed on:**	19/07/2018
Your order number:	12236-AF	**Analysis completed by:**	20/07/2018
Report Issue Number:	1	**Report issued on:**	20/07/2018
Samples Analysed:	2 bulk samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-93033

Project / Site name: Riverside MV

Lab Sample Number				1003934	1003935			
Sample Reference				AS1	AS2			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.10	0.10			
Date Sampled				17/07/2018	17/07/2018			
Time Taken				0900	0900			
Analytical Parameter (Bulk Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Asbestos Identification Name	Type	N/A	ISO 17025	Chrysotile, Crocidolite- Insulation Lagging	Chrysotile- Insulation Lagging			

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Analytical Report Number : 18-93033

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Bulks	Asbestos Identification in bulk material with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-96976

Project / Site name:	Riverside MV	**Samples received on:**	20/08/2018
Your job number:	12236	**Samples instructed on:**	20/08/2018
Your order number:	12236-AF	**Analysis completed by:**	29/08/2018
Report Issue Number:	1	**Report issued on:**	29/08/2018
Samples Analysed:	4 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-96976

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1026277	1026278	1026279	1026280	
Sample Reference				CC1	CC2	CC3	CC4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.20	0.30	0.40	
Date Sampled				17/08/2018	17/08/2018	17/08/2018	17/08/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	9.1	13	12	8.4	
Total mass of sample received	kg	0.001	NONE	0.51	0.46	0.56	0.49	
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Amosite & Chrysotile	Chrysotile	Amosite	Chrysotile & Amosite	
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Detected	
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	0.020	< 0.001	0.009	
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	0.020	< 0.001	0.009	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.4	10.7	8.6	11.1	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	2700	1800	830	2000	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.11	0.20	0.094	0.14	
Sulphide	mg/kg	1	MCERTS	1.1	13	1.8	36	
Total Sulphur	mg/kg	50	MCERTS	1400	1500	520	1400	
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.6	4.1	2.5	4.2	
Loss on Ignition @ 450°C	%	0.2	MCERTS	14.4	16.1	8.8	19.6	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	1.6	1.9	0.44	1.7	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	1.0	0.93	0.23	1.1	
Fluorene	mg/kg	0.05	MCERTS	1.0	1.0	0.29	1.4	
Phenanthrene	mg/kg	0.05	MCERTS	3.9	4.2	1.4	6.1	
Anthracene	mg/kg	0.05	MCERTS	0.69	0.89	1.5	1.7	
Fluoranthene	mg/kg	0.05	MCERTS	3.5	3.6	1.3	7.5	
Pyrene	mg/kg	0.05	MCERTS	2.4	2.6	1.0	5.0	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	1.9	0.74	4.4	
Chrysene	mg/kg	0.05	MCERTS	1.7	2.0	0.90	4.4	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.3	2.2	1.0	5.4	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.87	1.0	0.28	1.4	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	1.5	0.58	3.0	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.72	0.75	0.32	1.7	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.32	0.33	< 0.05	0.72	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.82	0.85	0.34	1.6	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	24.0	25.7	10.3	47.0	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	10	9.9	13	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.76	1.1	0.76	0.91	
Boron (water soluble)	mg/kg	0.2	MCERTS	1.9	1.5	1.0	1.4	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.5	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	16	19	18	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	49	62	33	59	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	36	43	32	62	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	24	22	25	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	25	23	28	32	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	75	110	74	130	

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Analytical Report Number: 18-96976

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1026277	1026278	1026279	1026280	
Sample Reference				CC1	CC2	CC3	CC4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.20	0.30	0.40	
Date Sampled				17/08/2018	17/08/2018	17/08/2018	17/08/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.1	< 1.0	3.9	4.8	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	4.4	< 2.0	10	15	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	26	23	19	45	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	67	230	110	220	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	99	250	140	280	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.7	3.9	3.5	5.9	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	12	15	13	25	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	19	64	22	69	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	43	250	77	180	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	77	330	120	280	

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-96976
Project / Site name: Riverside MV
Your Order No: 12236-AF

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1026277	CC1	0.10	150	Loose Fibres	**Amosite & Chrysotile**	< 0.001	**< 0.001**
1026278	CC2	0.20	145	Loose Fibrous Debris	**Chrysotile**	0.020	**0.020**
1026279	CC3	0.30	228	Loose Fibres	**Amosite**	< 0.001	**< 0.001**
1026280	CC4	0.40	224	Loose Fibres & Loose Fibrous Debris	**Chrysotile & Amosite**	0.009	**0.009**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-96976

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1026277	CC1	None Supplied	0.10	Grey sand with gravel.
1026278	CC2	None Supplied	0.20	Grey sand with gravel.
1026279	CC3	None Supplied	0.30	Brown clay and sand with gravel.
1026280	CC4	None Supplied	0.40	Grey loam and sand with rubble.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-96976

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

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Analytical Report Number : 18-96976

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-97303

Project / Site name:	Riverside MV	**Samples received on:**	22/08/2018
Your job number:	12236	**Samples instructed on:**	22/08/2018
Your order number:	12236/AF	**Analysis completed by:**	24/08/2018
Report Issue Number:	1	**Report issued on:**	24/08/2018
Samples Analysed:	5 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-97303

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				1028273	1028274	1028275	1028276	1028277
Sample Reference				AS(N)	AS(S)	AS(E)	AS(W)	AS(C)
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				21/08/2018	21/08/2018	21/08/2018	21/08/2018	21/08/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	Chrysotile	Chrysotile & Amosite	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.002	< 0.001	0.012	0.002	0.005
Asbestos Quantification Total	%	0.001	ISO 17025	0.002	< 0.001	0.012	0.002	0.005

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-97303
Project / Site name: Riverside MV
Your Order No: 12236/AF

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1028273	AS(N)	0.10	139	Loose Fibrous Debris	**Chrysotile**	0.002	**0.002**
1028274	AS(S)	0.10	135	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
1028275	AS(E)	0.10	119	Loose Fibres	**Chrysotile**	0.012	**0.012**
1028276	AS(W)	0.10	131	Loose Fibres	**Chrysotile & Amosite**	0.002	**0.002**
1028277	AS(C)	0.10	102	Loose Fibres	**Chrysotile**	0.005	**0.005**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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Analytical Report Number : 18-97303

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-98182

Project / Site name:	Riverside MV	**Samples received on:**	30/08/2018
Your job number:	12236	**Samples instructed on:**	30/08/2018
Your order number:	12236-AF	**Analysis completed by:**	03/09/2018
Report Issue Number:	1	**Report issued on:**	03/09/2018
Samples Analysed:	5 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-98182

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1033985	1033986	1033987	1033988	1033989
Sample Reference				AS(N) + 0.5m	AS(S) + 0.5m	AS(E) + 0.5m	AS(W) + 0.5m	AS(C)
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				29/08/2018	29/08/2018	29/08/2018	29/08/2018	29/08/2018
Time Taken				1100	1100	1100	1100	1100
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Crocidolite	-	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	< 0.001	-	-

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-98182
Project / Site name: Riverside MV
Your Order No: 12236-AF

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1033985	AS(N) + 0.5m	0.10	160	Loose Fibres	**Crocidolite**	< 0.001	**< 0.001**
1033987	AS(E) + 0.5m	0.10	148	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-98182

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-94241

Replaces Analytical Report Number : 18-94241, issue no. 1

Project / Site name:	Riverside MV	**Samples received on:**	30/07/2018
Your job number:	12236	**Samples instructed on:**	30/07/2018
Your order number:	12236-AF	**Analysis completed by:**	14/08/2018
Report Issue Number:	2	**Report issued on:**	14/08/2018
Samples Analysed:	1 soil sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-94241

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1010726				
Sample Reference				TS1				
Sample Number				None Supplied				
Depth (m)				0.00				
Date Sampled				25/07/2018				
Time Taken				0900				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	0.01				
Total mass of sample received	kg	0.001	NONE	0.31				
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	< 0.05				
Acenaphthylene	mg/kg	0.05	NONE	< 0.05				
Acenaphthene	mg/kg	0.05	NONE	< 0.05				
Fluorene	mg/kg	0.05	NONE	< 0.05				
Phenanthrene	mg/kg	0.05	NONE	< 0.05				
Anthracene	mg/kg	0.05	NONE	< 0.05				
Fluoranthene	mg/kg	0.05	NONE	< 0.05				
Pyrene	mg/kg	0.05	NONE	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	NONE	< 0.05				
Chrysene	mg/kg	0.05	NONE	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	NONE	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	NONE	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	NONE	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	< 0.80				
Monoaromatics								
Benzene	ug/kg	1	NONE	< 1.0				
Toluene	µg/kg	1	NONE	< 1.0				
Ethylbenzene	µg/kg	1	NONE	< 1.0				
p & m-xylene	µg/kg	1	NONE	< 1.0				
o-xylene	µg/kg	1	NONE	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	NONE	2400				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	NONE	31000				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	NONE	56000				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	NONE	87000				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	NONE	180000				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	NONE	770				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	NONE	24000				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	NONE	50000				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	NONE	150000				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	NONE	220000				

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Analytical Report Number: 18-94241

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1010726				
Sample Reference				TS1				
Sample Number				None Supplied				
Depth (m)				0.00				
Date Sampled				25/07/2018				
Time Taken				0900				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Miscellaneous Organics								
Product ID		N/A	NONE	See Attached				
Environmental Forensics								
Broadscan		N/A	NONE	See attached				

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Analytical Report Number : 18-94241

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1010726	TS1	None Supplied	0.00	Black tar. **

** Non MCERTS matrix.

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Analytical Report Number : 18-94241

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Product ID in soil	Determination of product ID by interpretation against standard chromatograms - Soil.	In-house method	L064-PL/UK	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
TO - Broadscan in soil	Qualitative GC-MS scan based on the NIST and Wiley 2013 mass spectral library.	In house method - GC-MS broadscan.		W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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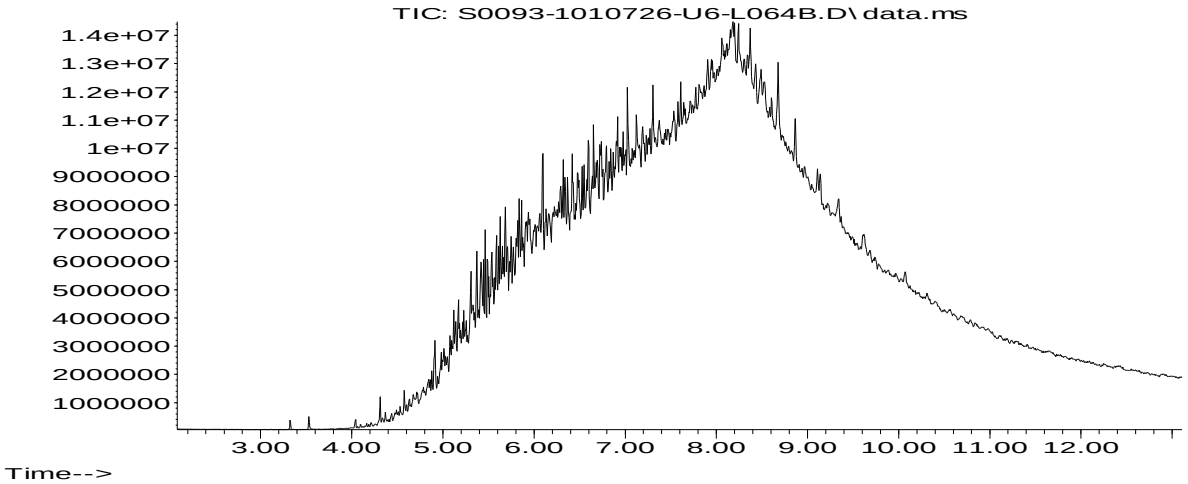
Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TS1		S	18-94241	1010726	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TS1		S	18-94241	1010726	b	TPHCWG (Soil)	L088/76-PL	b

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature



The total ion count (TIC trace) shows a carbon range from C10 to greater than C40
The sample TIC trace is complex, showing aromatic and aliphatic product sources.
The trace does not match the standard product profiles but is suggestive of lube oil.

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Analytical Report Number: 18-94241

Project / Site Name:	**Riverside MV**	**Samples received on:**	**30/07/2018**
Your job number:	**12236**	**Samples instructed on:**	**30/07/2018**
Your order number:	**12236-AF**	**Analysis completed by:**	**02/08/2018**
Report issue number:	**1**	**Report issued on:**	**03/08/2018**
Samples Analysed:	**1**	**Pages (inc):**	**Page 1 of 5**

Signed:

Neil Donovan

Environmental Forensics Manager

For & on behalf of i2 Analytical Ltd.

Laboratory Reference	Client reference	Depth
1010726	TS1	0.00

GC-MS Broadscan for identification of coal tar.

One soil sample was received in a plastic tub.

Owing to the scope of the testing, gas chromatography coupled with mass spectrometry (GC-MS) was used.

Although comprehensive, the suite above is only able to detect and identify those compounds amenable to each particular technique and therefore would not be able to cover every possible compound.

GC-MS Broadscan

The sample was extracted with dichloromethane (DCM) prior to evaporative concentration to produce a sample extract suitable for GC-MS analysis.

The GC-MS method was designed to cover an analyte range with boiling points from approximately 40°C to over 600°C.

Qualification each individual component was compared against both the NIST 2011 and Wiley 2010 mass spectral libraries for identification. A match factor of >80% indicates a confident match and was used in this instance.

Owing to the potential low levels present in the soil, matches between 50% and 80% were manually reviewed.

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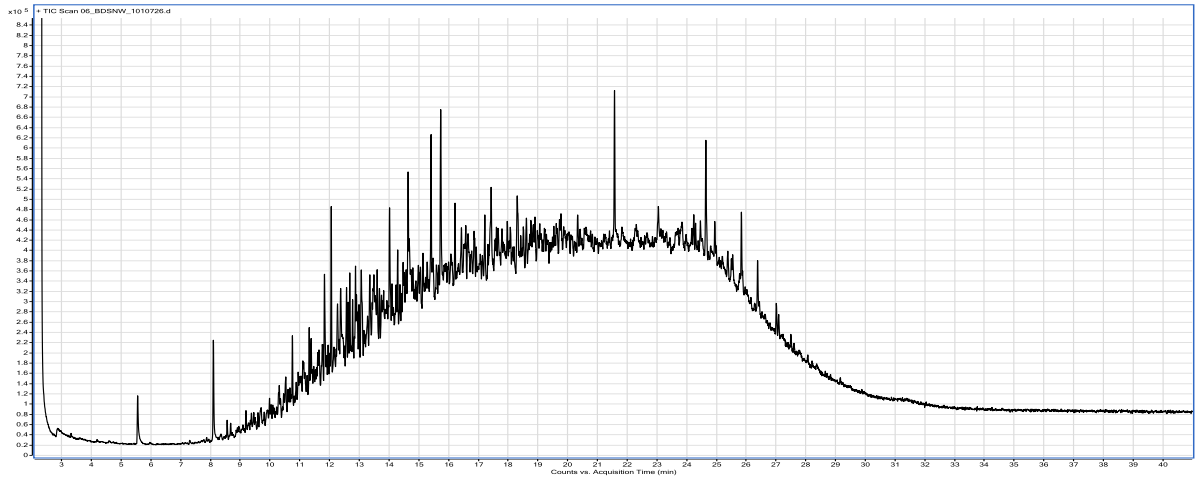
Company Registration No. 4750390 | VAT No. 821097249

Results and comments

The GC-MS analysis was run through deconvolution analysis prior to comparison against the NIST 2011 library as well as our own bespoke Coal Tar library. The latter contains approximately 160 of the most commonly encountered components present in coal tar.

The analysis of the deconvoluted mass spectra starts with the presence of certain indicator compounds and then, depending on whether their presence has been detected or not, moves to supporting indicator compounds.



Gravimetric analysis confirms a high level of hydrocarbons is present in the sample at approximately 73,000mg/kg.

Interpretation of the resulting mass spectra shows an unresolved complex mixture (UCM) of hydrocarbon series from C12 to C40 as shown in the extracted ion trace above.

Analysis of the residual PAHs shows a pattern more attributable to petrogenic rather than pyrogenic sources as one would assign to coal tar.

In addition several key heterocyclic marker compounds for coal tar are absent, these include;

Dibenzofuran
5H-Indeno[1,2-b]pyridine
9H-Fluoren-9-one
9H-Xanthene
3-Methylcarbazole

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4-Azapyrene
Benzo(c)carbazole

Laboratory Reference	Coal Tar Result (mg/kg)
1010726	Absent

Comments

The combination of hydrocarbon range, alkyl and parent PAH concentrations plus the absence of identified heterocyclic marker compounds suggests coal tar is absent.

The concentration of Benzo[a]pyrene, a primary marker compound, was under 25mg/kg.

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Analytical Report Number : 18-98773

Project / Site name:	Riverside MV	**Samples received on:**	04/09/2018
Your job number:	12236	**Samples instructed on:**	04/09/2018
Your order number:	12236-AF	**Analysis completed by:**	10/09/2018
Report Issue Number:	1	**Report issued on:**	10/09/2018
Samples Analysed:	1 soil sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-98773

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1037362				
Sample Reference				TS2				
Sample Number				None Supplied				
Depth (m)				0.00				
Date Sampled				03/09/2018				
Time Taken				1400				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	0.01				
Total mass of sample received	kg	0.001	NONE	2.0				
General Inorganics								
pH - Manual	pH Units	N/A	NONE	7.4				
Total Cyanide	mg/kg	1	NONE	U/S				
Total Sulphate as SO_4	mg/kg	50	NONE	510				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	NONE	0.085				
Sulphide	mg/kg	1	NONE	U/S				
Total Sulphur	mg/kg	50	NONE	5300				
Total Organic Carbon (TOC)	%	0.1	NONE	U/S				
Loss on Ignition @ 450°C	%	0.2	NONE	U/S				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	NONE	U/S				
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	0.20				
Acenaphthylene	mg/kg	0.05	NONE	< 0.05				
Acenaphthene	mg/kg	0.05	NONE	< 0.05				
Fluorene	mg/kg	0.05	NONE	< 0.05				
Phenanthrene	mg/kg	0.05	NONE	< 0.05				
Anthracene	mg/kg	0.05	NONE	< 0.05				
Fluoranthene	mg/kg	0.05	NONE	< 0.05				
Pyrene	mg/kg	0.05	NONE	1.3				
Benzo(a)anthracene	mg/kg	0.05	NONE	< 0.05				
Chrysene	mg/kg	0.05	NONE	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	NONE	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	NONE	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	NONE	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	1.46				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	NONE	2.1				
Beryllium (aqua regia extractable)	mg/kg	0.06	NONE	0.12				
Boron (water soluble)	mg/kg	0.2	NONE	1.5				
Cadmium (aqua regia extractable)	mg/kg	0.2	NONE	< 0.2				
Chromium (hexavalent)	mg/kg	4	NONE	U/S				
Chromium (aqua regia extractable)	mg/kg	1	NONE	2.4				
Copper (aqua regia extractable)	mg/kg	1	NONE	20				
Lead (aqua regia extractable)	mg/kg	1	NONE	12				
Mercury (aqua regia extractable)	mg/kg	0.3	NONE	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	NONE	9.5				
Selenium (aqua regia extractable)	mg/kg	1	NONE	2.0				
Vanadium (aqua regia extractable)	mg/kg	1	NONE	31				
Zinc (aqua regia extractable)	mg/kg	1	NONE	31				

U/S = Unsuitable Sample

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Analytical Report Number: 18-98773

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1037362				
Sample Reference				TS2				
Sample Number				None Supplied				
Depth (m)				0.00				
Date Sampled				03/09/2018				
Time Taken				1400				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	NONE	< 1.0				
Toluene	µg/kg	1	NONE	< 1.0				
Ethylbenzene	µg/kg	1	NONE	< 1.0				
p & m-xylene	µg/kg	1	NONE	< 1.0				
o-xylene	µg/kg	1	NONE	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	NONE	69				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	NONE	9300				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	NONE	24000				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	NONE	46000				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	NONE	80000				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	NONE	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	NONE	71				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	NONE	9200				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	NONE	30000				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	NONE	96000				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	NONE	140000				

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Analytical Report Number : 18-98773

Project / Site name: Riverside MV

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1037362	TS2	None Supplied	0.00	Non Soil **

** Non MCERTS matrix.

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Analytical Report Number : 18-98773

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

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Analytical Report Number : 18-98773

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-98774

Project / Site name:	Riverside MV	**Samples received on:**	04/09/2018
Your job number:	12236	**Samples instructed on:**	04/09/2018
Your order number:	12236-AF	**Analysis completed by:**	10/09/2018
Report Issue Number:	1	**Report issued on:**	10/09/2018
Samples Analysed:	1 WAC 10:1 Sample		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Waste Acceptance Criteria Analytical Results

Report No:	**18-98774**						
					Client:	**INTEGGEO**	
Location	**Riverside MV**						
Lab Reference (Sample Number)	1037373 / 1037374				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	03/09/2018				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TS2						
Depth (m)	0.00						
Solid Waste Analysis							
TOC (%)**	U/S				3%	5%	6%
Loss on Ignition (%) **	U/S				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	87000				500	--	--
Total PAH (WAC-17) (mg/kg)	1.9				100	--	--
pH (units)**	7.2				--	>6	--
Acid Neutralisation Capacity (mol / kg)	1.0				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0176			0.176	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0012			0.012	0.5	10	70
Copper *	0.0047			0.047	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0489			0.489	0.5	10	30
Nickel *	0.0033			0.033	0.4	10	40
Lead *	0.0027			0.027	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0058			0.058	4	50	200
Chloride *	2.4			24	800	4000	25000
Fluoride	< 0.050			< 0.50	10	150	500
Sulphate *	35			350	1000	20000	50000
TDS*	110			1100	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	10.6			106	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	100						
Moisture (%)	0.01						

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

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

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-98774

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1037373	TS2	None Supplied	0.00	Non Soil **

** Non MCERTS matrix.

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Analytical Report Number : 18-98774

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	in-house method	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

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Analytical Report Number : 18-98774

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

APPENDIX B

SUMMARY TABLES OF LABORATORY CHEMICAL TEST RESULTS - SOILS (DURING TURN AND COMPACT)

INTERIM

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12236
Site: Riverside Merthyr Vale
Soil Type: Made Ground - Turn and Compact
Soil Organic Matter: 1%

METALS AND SEMI-METALS

No.	Location	Depth (m)	Arsenic (mg/kg)	Boron (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (Elemental) (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
1	TP18	0.25	14	1.4	0.67	< 0.2	15	< 4.0	51	33	1.7	23	5.1	24	110
2	TP18	1.25	15	0.8	0.67	< 0.2	80	< 4.0	60	50	< 0.3	39	< 1.0	130	220
5	TP16	0.20	1.5	2.6	0.50	< 0.2	20	< 4.0	45	29	< 0.3	19	1.5	20	50
6	TP16	1.00	22	1.9	1.0	< 0.2	12	< 4.0	79	76	1.0	35	< 1.0	19	100
9	TP14	0.35	18	0.5	0.73	< 0.2	12	< 4.0	51	34	1.2	22	< 1.0	19	66
10	TP14	1.00	19	1.3	1.1	< 0.2	10	< 4.0	100	72	< 0.3	35	< 1.0	20	94
13	TP12	0.20	8.2	0.8	0.93	< 0.2	12	< 4.0	54	30	0.8	38	2.5	23	71
14	TP12	1.00	14	0.4	0.96	< 0.2	7.1	< 4.0	57	24	< 0.3	28	< 1.0	11	74
17	ES1	0.50	18	0.6	0.78	< 0.2	5.5	< 4.0	52	23	< 0.3	25	6.4	14	60
18	ES2	1.50	15	0.5	0.74	< 0.2	8.2	< 4.0	59	32	< 0.3	22	2.2	15	95
19	ES3	1.00	18	0.7	0.90	< 0.2	4.1	< 4.0	67	37	< 0.3	31	6.3	9.4	43
20	ES4	0.30	24	0.4	1.1	< 0.2	5.7	< 4.0	70	26	< 0.3	32	3.7	13	69
21	ES5	1.30	47	0.4	0.90	< 0.2	5.4	< 4.0	55	26	< 0.3	30	5.2	12	76
22	ES6	0.10	14	1.0	0.79	< 0.2	13	< 4.0	42	37	< 0.3	21	< 1.0	19	79
23	ES7	0.60	15	0.6	0.80	< 0.2	12	< 4.0	46	32	< 0.3	24	< 1.0	18	93
24	TP4	0.40	6.2	0.5	0.99	< 0.2	5.8	< 4.0	51	37	< 0.3	34	1.3	11	83
25	TP4	1.40	3.9	0.7	0.91	< 0.2	9.2	< 4.0	64	38	< 0.3	25	< 1.0	16	77
28	TP6	0.80	14	1.4	0.90	< 0.2	3.6	< 4.0	41	20	< 0.3	36	< 1.0	9.5	66
29	TP6	1.80	35	0.8	1.1	< 0.2	8.2	< 4.0	94	51	< 0.3	47	3.1	17	89
32	TP8	0.80	12	1.0	0.96	< 0.2	4.8	< 4.0	53	18	< 0.3	32	3.3	12	64
33	TP8	1.80	6.6	1.3	1.1	< 0.2	7.0	< 4.0	39	18	< 0.3	43	2.7	18	65
36	TP10	0.30	12	1.2	0.95	< 0.2	7.7	< 4.0	56	20	< 0.3	32	1.5	14	68
37	TP10	1.30	8.6	1.4	1.2	< 0.2	5.5	< 4.0	50	16	< 0.3	32	4.9	11	61
40	TP20	0.30	15	1.0	0.81	< 0.2	17	< 4.0	77	79	< 0.3	30	2.3	29	94
41	TP20	1.10	15	0.8	1.1	< 0.2	20	< 4.0	88	64	< 0.3	30	2.3	43	92
44	TP22	0.50	12	1.0	0.94	< 0.2	10	< 4.0	70	48	< 0.3	31	2.7	18	100
45	TP22	1.20	25	0.7	1.0	< 0.2	12	< 4.0	63	85	< 0.3	45	3.1	20	71
48	TP24	0.30	10	0.5	0.66	0.4	26	< 4.0	54	71	0.3	22	1.6	33	110
49	TP24	1.20	6.1	0.5	0.50	< 0.2	13	< 4.0	40	24	< 0.3	12	2.3	21	53
52	TP26	0.30	15	0.6	0.82	< 0.2	14	< 4.0	71	130	< 0.3	29	1.9	20	91
53	TP26	1.20	7.2	0.4	0.68	< 0.2	13	< 4.0	38	17	< 0.3	34	< 1.0	17	80
56	TP28	0.25	19	0.7	0.94	< 0.2	16	< 4.0	110	70	< 0.3	32	1.6	24	130
57	TP28	0.75	21	0.5	1.3	< 0.2	20	< 4.0	89	75	< 0.3	33	2.9	34	90
60	TP30	0.30	15	1.0	0.94	< 0.2	15	< 4.0	78	57	< 0.3	29	2.6	26	130
61	TP30	1.30	18	0.6	0.92	< 0.2	9.6	< 4.0	53	73	< 0.3	35	1.8	24	49
64	TP32	0.20	5.3	1.0	0.52	< 0.2	9.1	< 4.0	18	16	< 0.3	14	< 1.0	15	47
65	TP32	1.00	13	1.1	1.5	< 0.2	21	< 4.0	56	64	< 0.3	25	2.5	38	140
68	TP34	0.10	9.9	1.2	0.88	< 0.2	13	< 4.0	45	33	< 0.3	27	1.9	20	79
69	TP34	0.90	11	1.5	0.85	0.5	16	< 4.0	55	60	< 0.3	20	1.0	25	120
72	TP36	0.25	11	1.7	1.1	< 0.2	12	< 4.0	55	33	< 0.3	32	1.5	20	85
73	TP36	1.00	11	2.4	1.0	< 0.2	11	< 4.0	51	54	< 0.3	32	1.2	20	92
76	TP38	0.30	9.0	0.6	0.80	< 0.2	9.0	< 4.0	43	26	< 0.3	23	2.0	15	53
77	TP38	1.30	13	0.7	1.2	< 0.2	18	< 4.0	55	40	< 0.3	25	2.5	31	70
	Screening Criteria Value		37.0	290.0	1.7	11.0	-	6.0	2400.0	200.0	1.2	130.0	250.0	410.0	3700.0
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	-	S4UL	S4UL	C4SL	S4UL	S4UL	S4UL	S4UL	S4UL

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SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12236

Site: Riverside Merthyr Vale

Soil Type: Made Ground - Turn and Compact

Soil Organic Matter: 1%

INORGANIC CHEMICALS & OTHERS

No.	Location	Depth (m)	Cyanide (mg/kg)	Loss on ignition, dried solids (%)	Moisture content at 30 C (%)	Phenol (mg/kg)	pH (pH units)	Water Soluble Sulphate (g/l)	Sulphate Total as SO4 (mg/kg)	Sulphide (mg/kg)	Total Sulphur (mg/kg)	TOC by Ignition in O2 (%)	Equivalent SOM (%)	Asbestos in Soil	Asbestos Quantification (%)
1	TP18	0.25	< 1	26.6	6.7	< 1.0	9.7	0.21	2100	15	1800	6.0	10.32	Not-detected	-
2	TP18	1.25	< 1	29.3	9.8	< 1.0	8.2	0.26	1500	11	2300	5.9	10.15	Detected	< 0.001
3	TP17	0.30	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
4	TP17	1.30	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
5	TP16	0.20	< 1	19.2	6.9	< 1.0	10.1	0.37	1800	19	2200	4.4	7.57	Not-detected	-
6	TP16	1.00	< 1	32.6	26	< 1.0	8.6	0.060	930	1.2	1200	7.2	12.38	Detected	< 0.001
7	TP15	0.30	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	< 0.001
8	TP15	0.70	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
9	TP14	0.35	< 1	13.3	3.8	< 1.0	8.6	0.10	740	8.7	780	3.9	6.71	Not-detected	-
10	TP14	1.00	< 1	38.1	23	< 1.0	7.9	0.10	890	8.4	1800	8.0	13.76	Detected	0.006
11	TP13	0.20	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
12	TP13	0.80	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
13	TP12	0.20	< 1	15.9	1.6	< 1.0	6.9	0.18	1300	1.9	4800	4.2	7.22	Not-detected	-
14	TP12	1.00	< 1	20.5	3.4	< 1.0	7.3	0.17	970	3.3	1400	3.0	5.16	Not-detected	-
15	TP11	0.30	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
16	TP11	0.80	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
17	ES1	0.50	< 1	21.3	6.4	< 1.0	7.9	0.14	1600	4.8	2000	3.6	6.19	Not-detected	-
18	ES2	1.50	< 1	38.2	16	< 1.0	7.8	0.37	770	46	4200	5.7	9.80	Not-detected	-
19	ES3	1.00	< 1	32.9	8.4	< 1.0	7.6	0.42	1700	< 1.0	3600	6.5	11.18	Not-detected	-
20	ES4	0.30	< 1	20.8	6.8	< 1.0	7.9	0.078	1100	3.1	3100	3.2	5.50	Not-detected	-
21	ES5	1.30	< 1	20.3	6.6	< 1.0	8.0	0.17	1300	6.0	9400	2.4	4.13	Not-detected	-
22	ES6	0.10	< 1	12.8	7.2	< 1.0	8.5	0.17	1300	16	1300	3.0	5.16	Not-detected	-
23	ES7	0.60	< 1	17.7	9.9	< 1.0	8.3	0.12	1500	7.7	1500	3.4	5.85	Not-detected	-
24	TP4	0.40	< 1	16.7	4.9	< 1.0	6.7	0.053	550	< 1.0	1400	2.6	4.47	Not-detected	-
25	TP4	1.40	< 1	30.5	11	< 1.0	7.3	0.081	1000	16	1800	5.2	8.94	Not-detected	-
26	TP5	0.30	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
27	TP5	1.60	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
28	TP6	0.80	< 1	12.1	4.3	< 1.0	8.6	0.12	710	2.2	1200	1.7	2.92	Not-detected	-
29	TP6	1.80	< 1	25.1	24	< 1.0	8.1	0.12	5400	< 1.0	3900	5.3	9.12	Not-detected	-
30	TP7	0.30	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
31	TP7	1.30	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
32	TP8	0.80	< 1	18.6	5.5	< 1.0	8.0	0.36	1900	1.1	1500	2.1	3.61	Not-detected	-
33	TP8	1.80	< 1	9.9	7.9	< 1.0	8.2	0.24	830	1.8	550	1.7	2.92	Not-detected	-
34	TP9	0.40	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
35	TP9	1.40	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
36	TP10	0.30	< 1	13.9	5.9	< 1.0	8.3	0.077	750	3.5	1400	2.2	3.78	Not-detected	-
37	TP10	1.30	< 1	15.1	1.9	< 1.0	8.7	0.055	740	16	950	1.7	2.92	Not-detected	-
38	TP19	0.10	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
39	TP19	0.70	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
40	TP20	0.30	< 1	17.9	9.6	< 1.0	7.9	0.033	1200	11	1300	5.1	8.77	Not-detected	-
41	TP20	1.10	< 1	17.9	9.7	< 1.0	7.7	0.055	1300	25	1400	4.4	7.57	Not-detected	-
42	TP21	0.20	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
43	TP21	0.80	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
44	TP22	0.50	< 1	26.7	4.2	< 1.0	8.1	0.043	850	2.2	820	5.2	8.94	Not-detected	-
45	TP22	1.20	< 1	38.6	26	< 1.0	8.1	0.059	2000	< 1.0	1200	8.4	14.45	Not-detected	-
46	TP23	0.20	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
47	TP23	1.00	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
48	TP24	0.30	< 1	17.8	4.0	< 1.0	8.8	0.060	1000	6.1	1500	3.2	5.50	Not-detected	-
49	TP24	1.20	< 1	27.0	7.6	< 1.0	8.4	0.042	840	6.2	550	3.3	5.68	Not-detected	-
50	TP25	0.50	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
51	TP25	1.00	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
52	TP26	0.30	< 1	25.5	10	< 1.0	8.3	0.017	510	1.2	380	5.5	9.46	Not-detected	-
53	TP26	1.20	< 1	4.4	17	< 1.0	8.5	0.024	280	< 1.0	320	1.5	2.58	Not-detected	-
54	TP27	0.10-.	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	< 0.001
55	TP27	0.80	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
56	TP28	0.25	< 1	25.9	6.1	< 1.0	8.1	0.026	1000	9.1	860	5.6	9.63	Detected	0.001
57	TP28	0.75	< 1	26.3	11	< 1.0	8.3	0.049	960	30	1500	5.2	8.94	Detected	< 0.001
58	TP29	0.20	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	0.002

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SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12236

Site: Riverside Merthyr Vale

Soil Type: Made Ground - Turn and Compact

Soil Organic Matter: 1%

INORGANIC CHEMICALS & OTHERS

No.	Location	Depth (m)	Cyanide (mg/kg)	Loss on ignition, dried solids (%)	Moisture content at 30 C (%)	Phenol (mg/kg)	pH (pH units)	Water Soluble Sulphate (g/l)	Sulphate Total as SO4 (mg/kg)	Sulphide (mg/kg)	Total Sulphur (mg/kg)	TOC by Ignition in O2 (%)	Equivalent SOM (%)	Asbestos in Soil	Asbestos Quantification (%)
59	TP29	0.70	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	0.083
60	TP30	0.30	< 1	33.8	6.1	< 1.0	7.9	0.026	1100	7.2	1100	7.2	12.38	Not-detected	-
61	TP30	1.30	< 1	21.7	23	< 1.0	8.2	0.036	1100	11	840	5.9	10.15	Not-detected	-
62	TP31	0.30	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
63	TP31	0.80	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
64	TP32	0.20	< 1	6.7	4.6	< 1.0	8.9	0.036	560	10	420	1.5	2.58	Not-detected	-
65	TP32	1.00	< 1	18.5	12	< 1.0	8.6	0.22	1600	140	2000	5.5	9.46	Detected	0.965
66	TP33	0.30	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	< 0.001
67	TP33	1.30	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	0.001
68	TP34	0.10	< 1	19.2	9.2	< 1.0	8.6	0.056	1000	17	960	3.3	5.68	Detected	< 0.001
69	TP34	0.90	< 1	12.0	7.4	< 1.0	8.7	0.096	790	55	1200	2.7	4.64	Detected	0.005
70	TP35	0.50	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	0.001
71	TP35	1.30	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	0.003
72	TP36	0.25	< 1	22.2	9.5	< 1.0	8.5	0.13	1300	4.7	1300	4.5	7.74	Detected	0.003
73	TP36	1.00	< 1	19.0	7.5	< 1.0	8.6	0.35	1400	7.2	1000	3.5	6.02	Not-detected	-
74	TP37	0.50	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
75	TP37	1.50	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	< 0.001
76	TP38	0.30	< 1	10.3	1.9	< 1.0	7.9	0.046	1100	23	1100	3.1	5.33	Not-detected	-
77	TP38	1.30	< 1	17.4	12	< 1.0	8.0	0.026	960	63	1300	4.1	7.05	Detected	0.014
78	TP39	0.10	-	-	-	-	-	-	-	-	-	-	<0.1	Detected	< 0.001
79	TP39	1.00	-	-	-	-	-	-	-	-	-	-	<0.1	Not-detected	-
	Screening Criteria Value		34.0	-	-	280.0	-	-	-	-	-	-	-	-	0.001
	Source of Screening Criteria Value		ATRISK	-	-	S4UL	-	-	-	-	-	-	-	-	IOM

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Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12236

Site: Riverside Merthyr Vale

Soil Type: Made Ground - Turn and Compact

Soil Organic Matter: 1%

POLYAROMATIC HYDROCARBONS (PAH)

No.	Location	Depth (m)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(ghi)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(ah)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(123cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
1	TP18	0.25	1.1	< 0.05	1.1	2.8	1.9	3.7	1.2	1.6	3.8	< 0.05	6.4	1.2	1.1	1.7	7.0	4.7
2	TP18	1.25	2.0	0.25	2.4	2.8	1.7	3.2	1.0	1.7	3.6	< 0.05	8.5	2.2	1.1	4.4	15	5.5
5	TP16	0.20	2.5	< 0.05	2.4	11	7.9	12	4.4	6.6	12	1.4	14	2.5	4.0	2.4	10	14
6	TP16	1.00	2.2	0.15	2.0	5.0	3.6	5.2	2.0	3.7	5.8	0.68	12	2.1	2.0	1.4	7.3	9.0
9	TP14	0.35	1.9	0.19	2.3	7.8	5.2	8.2	2.8	4.6	8.1	0.92	13	1.5	2.7	1.1	8.5	9.1
10	TP14	1.00	34	< 0.05	15	15	5.3	7.7	1.9	4.5	11	< 0.05	77	43	1.9	13	74	52
13	TP12	0.20	0.37	< 0.05	0.33	0.62	0.45	0.76	< 0.05	0.33	1.1	< 0.05	1.9	0.44	< 0.05	0.58	1.9	1.4
14	TP12	1.00	2.8	0.14	2.9	3.8	1.0	1.7	0.23	0.88	3.7	< 0.05	18	4.9	0.24	1.3	9.6	14
17	ES1	0.50	0.48	< 0.05	0.47	1.2	0.78	1.4	0.47	0.64	1.5	< 0.05	2.2	0.51	0.39	1.3	2.6	1.5
18	ES2	1.50	1.8	< 0.05	2.1	5.7	3.0	5.3	1.3	2.3	5.3	0.74	9.1	1.7	1.4	4.8	8.0	6.2
19	ES3	1.00	2.7	< 0.05	0.93	0.42	0.12	0.54	< 0.05	0.13	0.93	< 0.05	1.3	1.1	< 0.05	11	5.1	0.89
20	ES4	0.30	0.45	< 0.05	0.36	0.56	0.31	0.76	< 0.05	0.22	1.0	< 0.05	1.4	0.52	< 0.05	1.4	2.4	1.1
21	ES5	1.30	0.50	< 0.05	0.32	0.39	0.30	0.63	< 0.05	0.24	0.79	< 0.05	1.3	0.62	< 0.05	1.1	2.1	0.96
22	ES6	0.10	0.82	0.29	1.3	4.6	3.5	5.8	2.2	2.3	3.9	0.87	7.2	0.97	2.1	1.4	5.7	5.4
23	ES7	0.60	1.3	0.54	2.0	5.6	5.4	9.8	3.4	3.2	8.3	1.4	16	1.6	3.4	3.1	16	11
24	TP4	0.40	< 0.05	< 0.05	0.16	0.62	< 0.05	< 0.05	< 0.05	< 0.05	0.95	< 0.05	1.0	< 0.05	< 0.05	0.64	1.5	0.83
25	TP4	1.40	0.43	< 0.05	0.63	2.0	1.6	2.7	1.1	1.1	2.5	0.31	3.4	0.41	0.94	0.73	3.1	2.6
28	TP6	0.80	0.21	< 0.05	0.11	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.41	< 0.05	< 0.05	1.3	1.5	0.26
29	TP6	1.80	0.68	< 0.05	0.51	0.76	0.45	0.96	0.27	0.38	1.0	< 0.05	1.6	0.60	0.23	4.0	3.6	1.1
32	TP8	0.80	< 0.05	< 0.05	< 0.05	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.20	< 0.05	0.36	< 0.05	< 0.05	1.1	1.2	0.25
33	TP8	1.80	< 0.05	< 0.05	< 0.05	0.46	0.23	0.38	< 0.05	0.16	0.34	< 0.05	0.58	< 0.05	< 0.05	0.66	1.0	0.40
36	TP10	0.30	0.25	< 0.05	0.25	0.49	0.36	0.68	0.23	0.22	0.76	< 0.05	1.1	0.30	0.20	1.5	2.0	0.71
37	TP10	1.30	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.83	0.66	< 0.05
40	TP20	0.30	0.96	0.18	1.7	4.6	4.3	8.5	2.6	1.8	5.9	1.1	8.2	0.92	2.9	1.4	6.2	5.8
41	TP20	1.10	3.9	0.40	7.0	24	19	30	10	13	20	4.5	36	4.2	10	1.8	22	27
44	TP22	0.50	0.97	0.18	1.1	3.2	2.5	4.4	1.5	1.7	3.1	0.64	5.4	0.88	1.5	1.4	4.5	4.1
45	TP22	1.20	1.6	0.15	1.4	2.3	1.8	3.9	1.2	1.1	3.2	0.50	5.6	1.6	1.2	3.2	7.5	4.3
48	TP24	0.30	0.95	0.12	1.2	3.9	3.2	5.8	2.2	1.5	3.9	0.74	5.7	0.68	2.1	1.6	5.3	3.9
49	TP24	1.20	0.39	< 0.05	0.42	0.58	0.54	0.93	0.36	0.43	0.87	0.14	1.5	0.29	0.36	1.8	2.4	1.0
52	TP26	0.30	0.23	0.13	0.54	2.0	2.0	3.8	1.3	0.94	2.7	0.51	3.6	0.22	1.3	0.80	2.7	2.9
53	TP26	1.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
56	TP28	0.25	0.95	0.16	1.2	4.6	3.4	7.0	2.0	1.8	4.1	0.85	7.5	0.89	2.2	1.7	6.0	5.6
57	TP28	0.75	1.0	< 0.05	0.94	2.6	2.2	3.6	1.4	2.0	3.6	0.54	5.3	0.95	1.4	1.2	4.3	4.0
60	TP30	0.30	0.82	0.18	1.4	3.0	2.7	5.3	1.9	1.5	4.3	0.71	6.3	1.1	1.9	3.0	6.8	4.4
61	TP30	1.30	0.17	< 0.05	0.21	0.38	0.38	0.73	0.30	0.25	0.75	< 0.05	0.86	0.20	0.25	0.64	1.5	0.56
64	TP32	0.20	0.14	< 0.05	0.17	0.46	0.39	0.76	0.31	0.33	0.79	< 0.05	0.88	0.16	0.30	0.53	1.2	0.61
65	TP32	1.00	0.45	0.12	0.66	2.6	2.5	3.7	1.7	2.2	3.7	< 0.05	4.7	0.45	1.5	1.4	4.7	3.3
68	TP34	0.10	3.7	0.16	3.6	10	9.2	13	5.8	6.1	12	1.9	17	2.5	5.5	1.8	16	12
69	TP34	0.90	3.7	0.17	3.6	12	12	16	7.5	7.8	14	2.1	18	3.0	6.9	1.4	13	13
72	TP36	0.25	1.2	< 0.05	1.0	1.9	1.5	2.4	1.1	1.3	2.8	< 0.05	4.6	1.2	1.0	3.1	6.4	3.3
73	TP36	1.00	0.78	< 0.05	1.0	2.5	2.2	2.9	1.5	1.8	3.1	< 0.05	4.7	0.94	1.3	2.3	4.9	3.4
76	TP38	0.30	1.0	< 0.05	1.8	7.7	5.8	7.9	3.0	4.8	7.6	1.0	12	1.2	2.9	0.75	7.7	8.2
77	TP38	1.30	1.9	0.19	3.4	17	12	18	6.3	8.1	15	2.2	26	1.7	6.0	0.79	12	19
	Screening Criteria Value		210.0	170.0	2400.0	7.2	2.2	2.6	320.0	77.0	15.0	0.2	280.0	170.0	27.0	2.3	95.0	620.0
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL

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Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12236

Site: Riverside Merthyr Vale

Soil Type: Made Ground - Turn and Compact

Soil Organic Matter: 1%

PETROLEUM HYDROCARBONS

No.	Location	Depth (m)	Aliphatic C5-C6 (mg/kg)	Aliphatic C6-C8 (mg/kg)	Aliphatic C8-C10 (mg/kg)	Aliphatic C10-C12 EPH (mg/kg)	Aliphatic C12-C16 EPH (mg/kg)	Aliphatic C16-C35 EPH (mg/kg)	Aromatic C5-C7 (mg/kg)	Aromatic C7-C8 (mg/kg)	Aromatic C8-C10 (mg/kg)	Aromatic C10-C12 EPH (mg/kg)	Aromatic C12-C16 EPH (mg/kg)	Aromatic C16-C21 EPH (mg/kg)	Aromatic C21-C35 EPH (mg/kg)
1	TP18	0.25	< 0.001	< 0.001	< 0.001	13	32	478	< 0.001	< 0.001	< 0.001	11	40	100	440
2	TP18	1.25	< 0.001	< 0.001	< 0.001	4.9	17	814	< 0.001	< 0.001	< 0.001	6.4	15	74	390
5	TP16	0.20	< 0.001	< 0.001	< 0.001	9.7	220	840	< 0.001	< 0.001	< 0.001	17	140	200	210
6	TP16	1.00	< 0.001	< 0.001	< 0.001	6.5	23	251	< 0.001	< 0.001	< 0.001	2.7	26	130	120
9	TP14	0.35	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	3.6	15	61	120
10	TP14	1.00	< 0.001	< 0.001	< 0.001	< 1.0	36	445	< 0.001	< 0.001	< 0.001	18	**260**	**1800**	390
13	TP12	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
14	TP12	1.00	< 0.001	< 0.001	< 0.001	1.6	4.9	40	< 0.001	< 0.001	< 0.001	3.9	40	260	84
17	ES1	0.50	< 0.001	< 0.001	< 0.001	1.4	6.4	66	< 0.001	< 0.001	< 0.001	1.6	6.2	11	12
18	ES2	1.50	< 0.001	< 0.001	< 0.001	1.6	9.7	114	< 0.001	< 0.001	< 0.001	5.8	23	37	62
19	ES3	1.00	< 0.001	< 0.001	< 0.001	2.5	13	75	< 0.001	< 0.001	< 0.001	15	46	30	34
20	ES4	0.30	< 0.001	< 0.001	< 0.001	2.9	7.7	71	< 0.001	< 0.001	< 0.001	2.2	12	48	42
21	ES5	1.30	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	1.3	3.8	< 10	< 10
22	ES6	0.10	< 0.001	< 0.001	< 0.001	2.5	9.5	164	< 0.001	< 0.001	< 0.001	3.7	8.5	41	260
23	ES7	0.60	< 0.001	< 0.001	< 0.001	2.4	6.4	132	< 0.001	< 0.001	< 0.001	5.0	6.8	31	34
24	TP4	0.40	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	3.9	< 10	< 10
25	TP4	1.40	< 0.001	< 0.001	< 0.001	4.8	16	124	< 0.001	< 0.001	< 0.001	3.7	17	38	76
28	TP6	0.80	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	1.8	4.3	< 10	< 10
29	TP6	1.80	< 0.001	< 0.001	< 0.001	4.4	35	115	< 0.001	< 0.001	< 0.001	7.9	31	51	93
32	TP8	0.80	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	1.8	3.4	< 10	< 10
33	TP8	1.80	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	1.7	6.5	11	21
36	TP10	0.30	< 0.001	< 0.001	< 0.001	< 1.0	3.3	23	< 0.001	< 0.001	< 0.001	4.1	13	17	27
37	TP10	1.30	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
40	TP20	0.30	< 0.001	< 0.001	< 0.001	1.7	11	351	< 0.001	< 0.001	< 0.001	6.3	26	110	290
41	TP20	1.10	< 0.001	< 0.001	< 0.001	< 1.0	8.3	186	< 0.001	< 0.001	< 0.001	2.5	29	160	330
44	TP22	0.50	< 0.001	< 0.001	< 0.001	1.4	5.5	137	< 0.001	< 0.001	< 0.001	4.5	13	57	100
45	TP22	1.20	< 0.001	< 0.001	< 0.001	< 1.0	4.6	24	< 0.001	< 0.001	< 0.001	4.2	12	33	32
48	TP24	0.30	< 0.001	< 0.001	< 0.001	2.9	8.4	116	< 0.001	< 0.001	< 0.001	2.1	5.5	20	37
49	TP24	1.20	< 0.001	< 0.001	< 0.001	< 1.0	2.4	53	< 0.001	< 0.001	< 0.001	4.0	11	37	60
52	TP26	0.30	< 0.001	< 0.001	< 0.001	< 1.0	3.2	75	< 0.001	< 0.001	< 0.001	7.7	15	59	140
53	TP26	1.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
56	TP28	0.25	< 0.001	< 0.001	< 0.001	< 1.0	4.5	124	< 0.001	< 0.001	< 0.001	2.3	15	71	150
57	TP28	0.75	< 0.001	< 0.001	< 0.001	1.4	11	289	< 0.001	< 0.001	< 0.001	12	33	120	230
60	TP30	0.30	< 0.001	< 0.001	< 0.001	2.5	6.8	118	< 0.001	< 0.001	< 0.001	3.7	17	73	200
61	TP30	1.30	< 0.001	< 0.001	< 0.001	1.5	< 2.0	39	< 0.001	< 0.001	< 0.001	1.2	2.7	< 10	< 10
64	TP32	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
65	TP32	1.00	< 0.001	< 0.001	< 0.001	2.0	13	357	< 0.001	< 0.001	< 0.001	7.4	30	110	390
68	TP34	0.10	< 0.001	< 0.001	< 0.001	2.5	8.8	175	< 0.001	< 0.001	< 0.001	4.2	28	120	190
69	TP34	0.90	< 0.001	< 0.001	< 0.001	2.9	14	418	< 0.001	< 0.001	< 0.001	1.9	33	180	420
72	TP36	0.25	< 0.001	< 0.001	< 0.001	4.9	22	235	< 0.001	< 0.001	< 0.001	4.6	27	87	130
73	TP36	1.00	< 0.001	< 0.001	< 0.001	< 1.0	5.4	116	< 0.001	< 0.001	< 0.001	2.8	13	54	110
76	TP38	0.30	< 0.001	< 0.001	< 0.001	< 1.0	12	115	< 0.001	< 0.001	< 0.001	< 1.0	6.4	42	87
77	TP38	1.30	< 0.001	< 0.001	< 0.001	4.2	17	206	< 0.001	< 0.001	< 0.001	< 1.0	10	78	150
	Screening Criteria Value		**42.0**	**100.0**	**27.0**	**130.0**	**1100.0**	**65000.0**	**0.1**	**130.0**	**34.0**	**74.0**	**140.0**	**260.0**	**1100.0**
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL

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Intégral Géotechnique

APPENDIX C

LABORATORY CHEMICAL TEST RESULTS
LEACHATES (DURING TURN AND COMPACT)

INTERIM

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Analytical Report Number : 18-83709

Project / Site name:	Merthyr Vale	**Samples received on:**	30/04/2018
Your job number:	11826	**Samples instructed on:**	30/04/2018
Your order number:	11826-AF	**Analysis completed by:**	08/05/2018
Report Issue Number:	1	**Report issued on:**	08/05/2018
Samples Analysed:	16 leachate samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-83709

Project / Site name: Merthyr Vale

Your Order No: 11826-AF

Lab Sample Number				951709	951710	951711	951712	951713
Sample Reference				L1	L2	L3	L4	L5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	2.00	1.00	0.50	0.90
Date Sampled				27/04/2018	27/04/2018	27/04/2018	27/04/2018	27/04/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	8.0	7.2	7.9	7.0	7.7
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	100	ISO 17025	5090	1030	4220	953	3330
Total Sulphur	µg/l	15	NONE	1700	340	1400	320	1100
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Organic Carbon (TOC)	mg/l	0.1	NONE	3.75	4.43	4.73	4.34	4.43
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	7.2	< 1.1	4.7	2.2	3.3
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4	0.6	0.5	0.6	0.7
Copper (dissolved)	µg/l	0.7	ISO 17025	6.0	4.2	7.7	7.2	7.2
Lead (dissolved)	µg/l	1	ISO 17025	1.1	< 1.0	2.2	2.2	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.9	1.0	0.7	1.0	1.1
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	2.3	< 1.7	5.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	2.1	4.2	3.8	6.1	4.0
Petroleum Hydrocarbons								
TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 18-83709

Project / Site name: Merthyr Vale

Your Order No: 11826-AF

Lab Sample Number				951714	951715	951716	951717	951718
Sample Reference				L6	L7	L8	L9	L10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	1.00	0.50	1.40	0.50
Date Sampled				27/04/2018	27/04/2018	27/04/2018	27/04/2018	27/04/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.7	8.3	7.7	7.8	7.7
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	100	ISO 17025	1800	4760	1450	7560	5660
Total Sulphur	µg/l	15	NONE	600	1600	480	2500	1900
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Organic Carbon (TOC)	mg/l	0.1	NONE	4.72	4.79	4.57	4.46	5.35
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	7.9	11	6.0	1.1	2.3
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	19	10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4	0.7	< 0.4	0.6	0.7
Copper (dissolved)	µg/l	0.7	ISO 17025	7.6	11	7.2	8.8	9.6
Lead (dissolved)	µg/l	1	ISO 17025	3.1	3.8	< 1.0	< 1.0	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.9	1.1	1.1	0.4	2.1
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	8.0	< 1.7	2.4	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	2.9	5.5	4.9	6.8	4.5
Petroleum Hydrocarbons								
TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 18-83709

Project / Site name: Merthyr Vale

Your Order No: 11826-AF

Lab Sample Number				951719	951720	951721	951722	951723
Sample Reference				L11	L12	L13	L14	L15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.40	2.00	0.50	1.00	1.90
Date Sampled				27/04/2018	27/04/2018	27/04/2018	27/04/2018	27/04/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.9	7.4	7.7	7.0	7.1
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	100	ISO 17025	2340	7640	994	1530	4860
Total Sulphur	µg/l	15	NONE	780	2500	330	510	1600
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Organic Carbon (TOC)	mg/l	0.1	NONE	4.38	4.04	4.43	4.30	3.76
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	5.4	3.2	< 1.1	2.8	< 1.1
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.6	0.5	0.5	0.6	0.6
Copper (dissolved)	µg/l	0.7	ISO 17025	7.1	4.5	6.5	5.9	4.5
Lead (dissolved)	µg/l	1	ISO 17025	1.8	< 1.0	< 1.0	2.1	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	6.5	0.5	1.2	2.2	1.4
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	3.7	< 1.7	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	4.1	4.5	3.5	3.0	2.9
Petroleum Hydrocarbons								
TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 18-83709

Project / Site name: Merthyr Vale

Your Order No: 11826-AF

Lab Sample Number				951724				
Sample Reference				L16				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				27/04/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.8				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	100	ISO 17025	2870				
Total Sulphur	µg/l	15	NONE	960				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	NONE	5.02				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	5.5				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.5				
Copper (dissolved)	µg/l	0.7	ISO 17025	8.3				
Lead (dissolved)	µg/l	1	ISO 17025	2.4				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.1				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Zinc (dissolved)	µg/l	0.4	ISO 17025	3.8				
Petroleum Hydrocarbons								
TPH1 (C10 - C40)	µg/l	10	NONE	< 10				

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Analytical Report Number : 18-83709

Project / Site name: Merthyr Vale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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APPENDIX D

SUMMARY OF LABORATORY CHEMICAL TEST RESULTS
LEACHATES (DURING TURN AND COMPACT)

INTERIM

Summary of Leachate Results - Riverside, Merthyr Vale

11826/AF/00

	Determinand	Unit	Sample Location																Guideline Value		
			L1 @ 1.50m	L2 @ 2.00m	L3 @ 1.00m	L4 @ 0.50m	L5 @ 0.90m	L6 @ 2.00m	L7 @ 1.00m	L8 @ 0.50m	L9 @ 1.40m	L10 @ 0.50m	L11 @ 1.40m	L12 @ 2.00m	L13 @ 0.50m	L14 @ 1.00m	L15 @ 1.90m	L16 @ 1.00m	MAC-EQS Inland Surface Water C3	Freshwater EQS >100-150mg/l CaCO3	UK Drinking Water Standards
Metals and Non-Metals	Arsenic	ug/l	7.20	< 1.1	4.70	2.20	3.30	7.90	**11.00**	6.00	1.10	2.30	5.40	3.20	< 1.1	2.80	< 1.1	5.50	-	50	10
	Beryllium	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-	-
	Cadmium	ug/l	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	0.6	5	5
	Chromium	ug/l	< 0.4	0.60	0.50	0.60	0.70	< 0.4	0.70	< 0.4	0.60	0.70	0.60	0.50	0.50	0.60	0.60	0.50	-	20	50
	Copper	ug/l	6.00	4.20	7.70	7.20	7.20	7.60	**11.00**	7.20	8.80	9.60	7.10	4.50	6.50	5.90	4.50	8.30	-	10	2000
	Cyanide	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	-	50
	Lead	ug/l	1.10	< 1.0	2.20	2.20	< 1.0	3.10	3.80	< 1.0	< 1.0	< 1.0	1.80	< 1.0	< 1.0	2.10	< 1.0	2.40	14	10	10
	Mercury	ug/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.07	1	-
	Nickel	ug/l	0.90	1.00	0.70	1.00	1.10	0.90	1.10	1.10	0.40	2.10	6.50	0.50	1.20	2.20	1.40	1.10	34	150	20
	pH	pH Units	8.00	7.20	7.90	7.00	7.70	7.70	8.30	7.70	7.80	7.70	7.90	7.40	7.70	7.00	7.10	7.80	-	-	-
	Phenols Mono (Phenol Index)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	30	0.5
	Selenium	ug/l	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	-	-	10
	Sulphate as SO4	ug/l	5090.00	1030.00	4220.00	953.00	3330.00	1800.00	4760.00	1450.00	7560.00	5660.00	2340.00	7640.00	994.00	1530.00	4860.00	2870.00	-	400000	250000
	Sulphide	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	-	0.25	-
	Vanadium	ug/l	< 1.7	< 1.7	2.30	< 1.7	5.00	< 1.7	8.00	< 1.7	2.40	< 1.7	< 1.7	< 1.7	3.70	< 1.7	< 1.7	< 1.7	-	20	-
	Zinc	ug/l	2.10	4.20	3.80	6.10	4.00	2.90	5.50	4.90	6.80	4.50	4.10	4.50	3.50	3.00	2.90	3.80	-	75	5000
PAH	Acenaphthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Acenaphthylene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.1	10	-
	Benzo (a) anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Benzo (g,h,i) perylene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0082	10	-
	Benzo (a) pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.27	10	0.01
	Benzo (b) fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.017	10	-
	Benzo (k) fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.017	10	-
	Chrysene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Dibenz (a,h) anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.12	10	-
	Fluorene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Indeno (1,2,3) cd pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Naphthalene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	130	10	-
	Phenanthrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	PAH, Total	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-	0.1
	TPH1 (C10 - C40)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50		1

Notes:
EQS for Naphthalene used for all PAH compounds
EQS for Benzene used for all TPH compounds

Results exceeding the MAC-EQS value, or the most conservative EQS/UKDWS guideline value where MAC values are unavailable, are highlighted in **red bold type**

MAC-EQS values sourced from Water Framework Directive

Freshwater EQS values sourced from Council Directive on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community (Dangerous Substances Directive) - List I and List II substances

Intégral Géotechnique

APPENDIX E

CHEMICAL TEST RESULTS - SOILS (IMPORTATION)

INTERIM

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Analytical Report Number : 18-86842

Project / Site name:	Riverside MV	**Samples received on:**	29/05/2018
Your job number:	12236	**Samples instructed on:**	29/05/2018
Your order number:		**Analysis completed by:**	06/06/2018
Report Issue Number:	1	**Report issued on:**	06/06/2018
Samples Analysed:	4 soil samples		

Signed: CCStone

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-86842

Project / Site name: Riverside MV

Lab Sample Number				968958	968959	968960	968961	
Sample Reference				B1	B2	B3	B4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				25/05/2018	25/05/2018	25/05/2018	25/05/2018	
Time Taken				1030	1030	1030	1030	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	13	< 0.1	< 0.1	19	
Moisture Content	%	N/A	NONE	3.9	5.6	8.3	4.2	
Total mass of sample received	kg	0.001	NONE	0.50	0.47	0.46	0.48	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	8.5	9.9	10.8	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	1800	1900	2800	1800	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.036	0.39	0.13	
Sulphide	mg/kg	1	MCERTS	< 1.0	4.6	6.3	4.3	
Total Sulphur	mg/kg	50	MCERTS	600	820	1100	630	
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.3	1.2	2.4	0.6	
Loss on Ignition @ 450°C	%	0.2	MCERTS	0.9	3.2	4.7	1.5	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.54	0.26	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.72	0.47	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.54	0.40	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.33	0.28	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.40	0.34	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.47	0.41	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.17	0.16	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.35	0.27	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	3.52	2.59	< 0.80	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	15	12	14	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.66	0.84	0.77	0.77	
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.5	1.0	0.6	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.3	0.2	0.5	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	15	25	11	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	44	30	30	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34	60	40	33	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	0.5	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	22	20	20	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	1.2	1.3	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	11	17	30	15	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	38	68	61	50	

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Analytical Report Number: 18-86842

Project / Site name: Riverside MV

Lab Sample Number				968958	968959	968960	968961	
Sample Reference				B1	B2	B3	B4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				25/05/2018	25/05/2018	25/05/2018	25/05/2018	
Time Taken				1030	1030	1030	1030	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	2.6	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	80	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	16	15	< 8.0	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	82	16	15	< 10	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	11	< 10	< 10	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	23	38	52	46	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	34	45	57	50	

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Analytical Report Number : 18-86842

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
968958	B1	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
968959	B2	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
968960	B3	None Supplied	None Supplied	Brown loam and clay with gravel and vegetation.
968961	B4	None Supplied	None Supplied	Brown loam and sand with stones and gravel

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Analytical Report Number : 18-86842

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-86842

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-89148

Replaces Analytical Report Number : 18-89148, issue no. 1

Project / Site name:	Riverside MV	**Samples received on:**	15/06/2018
Your job number:	12236	**Samples instructed on:**	15/06/2018
Your order number:	12236-AF	**Analysis completed by:**	03/07/2018
Report Issue Number:	2	**Report issued on:**	03/07/2018
Samples Analysed:	5 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-89148

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				982602	982603	982604	982605	982606
Sample Reference				ES5	ES6	ES7	ES8	ES9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018
Time Taken				1420	1420	1420	1530	1530
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.1	11	15	12	6.4
Total mass of sample received	kg	0.001	NONE	0.53	0.46	0.52	0.47	0.51
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	7.5	7.8	8.1	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	140	540	360	220	400
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.013	0.015	0.012	0.035
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	78	280	210	150	220
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.6	2.0	1.2	0.9	0.4
Loss on Ignition @ 450°C	%	0.2	MCERTS	1.7	4.6	3.1	2.3	1.8
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.0	13	9.2	7.9	6.5
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.47	0.46	0.40	0.59	0.64
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	1.1	0.6	0.3	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	21	20	16	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	13	27	7.3	8.6
Lead (aqua regia extractable)	mg/kg	1	MCERTS	8.7	17	13	19	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	21	22	16	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	3.3	3.3	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	13	23	24	25	24
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	44	59	61	52	57

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-89148

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				982602	982603	982604	982605	982606
Sample Reference				ES5	ES6	ES7	ES8	ES9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018
Time Taken				1420	1420	1420	1530	1530
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	14
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	23
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number : 18-89148

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
982602	ES5	None Supplied	None Supplied	Brown loam and sand with gravel.
982603	ES6	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
982604	ES7	None Supplied	None Supplied	Brown loam and clay.
982605	ES8	None Supplied	None Supplied	Light brown sandy loam with gravel and vegetation.
982606	ES9	None Supplied	None Supplied	Light brown sandy loam with gravel.

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Analytical Report Number : 18-89148

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-89148

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 18-90092

Project / Site name:	Riverside MV	**Samples received on:**	25/06/2018
Your job number:	12236	**Samples instructed on:**	25/06/2018
Your order number:	12236-AF	**Analysis completed by:**	03/07/2018
Report Issue Number:	1	**Report issued on:**	03/07/2018
Samples Analysed:	2 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90092

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				987996	987997			
Sample Reference				ES10	ES11			
Sample Number				Stockpile	Stockpile			
Depth (m)				None Supplied	None Supplied			
Date Sampled				13/06/2018	13/06/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	5.1	4.6			
Total mass of sample received	kg	0.001	NONE	0.54	0.52			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.0	7.9			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	250	260			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.013			
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0			
Total Sulphur	mg/kg	50	MCERTS	110	130			
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	1.0			
Loss on Ignition @ 450°C	%	0.2	MCERTS	1.8	2.2			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.36			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.50			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.41			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.19			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.27			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	1.73			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	11			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.94	0.82			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.5			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	13			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	14			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	18			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32	27			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	4.3			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	19	15			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	66	62			

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Analytical Report Number: 18-90092

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				987996	987997			
Sample Reference				ES10	ES11			
Sample Number				Stockpile	Stockpile			
Depth (m)				None Supplied	None Supplied			
Date Sampled				13/06/2018	13/06/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	1.6			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.4			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	17			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	32			

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Analytical Report Number : 18-90092

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
987996	ES10	Stockpile	None Supplied	Light brown sandy clay with gravel and vegetation.
987997	ES11	Stockpile	None Supplied	Brown sandy clay with gravel and vegetation.

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Analytical Report Number : 18-90092

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-90092

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
ES10	Stockpile	S	18-90092	987996	c	Sulphide in soil	L010-PL	c
ES10	Stockpile	S	18-90092	987996	c	Total cyanide in soil	L080-PL	c
ES11	Stockpile	S	18-90092	987997	c	Sulphide in soil	L010-PL	c
ES11	Stockpile	S	18-90092	987997	c	Total cyanide in soil	L080-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 18-90404

Project / Site name:	Riverside MV	**Samples received on:**	27/06/2018
Your job number:	12236	**Samples instructed on:**	27/06/2018
Your order number:	12236-AF	**Analysis completed by:**	05/07/2018
Report Issue Number:	1	**Report issued on:**	05/07/2018
Samples Analysed:	2 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90404

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				989540	989541			
Sample Reference				ES12	ES13			
Sample Number				Stockpile	Stockpile			
Depth (m)				None Supplied	None Supplied			
Date Sampled				26/06/2018	26/06/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	10	9.7			
Total mass of sample received	kg	0.001	NONE	0.56	0.60			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	8.1			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	1300	1400			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.022	0.021			
Sulphide	mg/kg	1	MCERTS	2.1	1.2			
Total Sulphur	mg/kg	50	MCERTS	440	600			
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.3	0.3			
Loss on Ignition @ 450°C	%	0.2	MCERTS	1.6	1.7			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			

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Analytical Report Number: 18-90404

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				989540	989541			
Sample Reference				ES12	ES13			
Sample Number				Stockpile	Stockpile			
Depth (m)				None Supplied	None Supplied			
Date Sampled				26/06/2018	26/06/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	20			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.85	0.83			
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.4			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	0.6			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	14			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37	36			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	39	36			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	24			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.8			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	15	15			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	39			
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

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Analytical Report Number : 18-90404

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
989540	ES12	Stockpile	None Supplied	Brown clay and sand.
989541	ES13	Stockpile	None Supplied	Brown clay and sand.

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Analytical Report Number : 18-90404

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-90404

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-90940

Project / Site name:	Riverside MV	**Samples received on:**	02/07/2018
Your job number:	12236	**Samples instructed on:**	02/07/2018
Your order number:	12236-AF	**Analysis completed by:**	10/07/2018
Report Issue Number:	1	**Report issued on:**	10/07/2018
Samples Analysed:	2 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90940

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992501	992502			
Sample Reference				ES14	ES15			
Sample Number				Stockpile	Stockpile			
Depth (m)				None Supplied	None Supplied			
Date Sampled				28/06/2018	28/06/2018			
Time Taken				1530	1530			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	26			
Moisture Content	%	N/A	NONE	2.9	2.7			
Total mass of sample received	kg	0.001	NONE	0.55	0.53			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	5.3	5.3			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	510	380			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.067			
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0			
Total Sulphur	mg/kg	50	MCERTS	210	200			
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.1	1.0			
Loss on Ignition @ 450°C	%	0.2	MCERTS	3.2	2.9			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			

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Analytical Report Number: 18-90940

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				992501	992502			
Sample Reference				ES14	ES15			
Sample Number				Stockpile	Stockpile			
Depth (m)				None Supplied	None Supplied			
Date Sampled				28/06/2018	28/06/2018			
Time Taken				1530	1530			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	21			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.71	0.64			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.2			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	17			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	19			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	19			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	26			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.9	1.8			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	23			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	73	74			
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	10	< 10			

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Analytical Report Number : 18-90940

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
992501	ES14	Stockpile	None Supplied	Light brown sand with gravel and vegetation.
992502	ES15	Stockpile	None Supplied	Light brown sand with stones and gravel.

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Analytical Report Number : 18-90940

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-90940

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-91165

Project / Site name:	Riverside MV	**Samples received on:**	03/07/2018
Your job number:	12236	**Samples instructed on:**	03/07/2018
Your order number:	12236-AF	**Analysis completed by:**	11/07/2018
Report Issue Number:	1	**Report issued on:**	11/07/2018
Samples Analysed:	3 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-91165

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				993685	993686	993687		
Sample Reference				ES16	ES17	ES18		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.10	0.10	0.10		
Date Sampled				02/07/2018	02/07/2018	02/07/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	3.7	11	15		
Total mass of sample received	kg	0.001	NONE	0.56	0.60	0.50		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6	7.3	6.8		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	390	340	480		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.038	0.020	0.033		
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Total Sulphur	mg/kg	50	MCERTS	190	160	280		
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.9	0.9	1.7		
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.4	2.3	3.7		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80		

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Analytical Report Number: 18-91165

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				993685	993686	993687		
Sample Reference				ES16	ES17	ES18		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.10	0.10	0.10		
Date Sampled				02/07/2018	02/07/2018	02/07/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	9.7	11		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.76	0.44	0.35		
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.6	0.9		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	14	16		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	19	18		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	13	19		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	20	16		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	< 1.0	1.5		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20	19	24		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	65	48	50		
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		

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Analytical Report Number : 18-91165

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
993685	ES16	None Supplied	0.10	Light brown sandy loam with gravel.
993686	ES17	None Supplied	0.10	Light brown loam and clay.
993687	ES18	None Supplied	0.10	Light brown loam and clay with gravel.

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Analytical Report Number : 18-91165

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-91165

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-91450

Project / Site name:	Riverside MV	**Samples received on:**	05/07/2018
Your job number:	12236	**Samples instructed on:**	05/07/2018
Your order number:	12236-AF	**Analysis completed by:**	13/07/2018
Report Issue Number:	1	**Report issued on:**	13/07/2018
Samples Analysed:	2 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-91450

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995174	995175			
Sample Reference				ES19	ES20			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.10	0.10			
Date Sampled				04/07/2018	04/07/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	15	15			
Total mass of sample received	kg	0.001	NONE	0.55	0.54			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.2	7.1			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	370	370			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.016	0.028			
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0			
Total Sulphur	mg/kg	50	MCERTS	190	190			
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.2	1.2			
Loss on Ignition @ 450°C	%	0.2	MCERTS	3.0	2.9			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			

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Analytical Report Number: 18-91450

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				995174	995175			
Sample Reference				ES19	ES20			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.10	0.10			
Date Sampled				04/07/2018	04/07/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.4	8.8			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.41	0.39			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.6			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	19			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	14			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	14			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	18			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.7			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	21			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	52	51			
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

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Analytical Report Number : 18-91450

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
995174	ES19	None Supplied	0.10	Brown loam and clay.
995175	ES20	None Supplied	0.10	Brown loam and clay.

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Analytical Report Number : 18-91450

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-91450

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-92066

Replaces Analytical Report Number : 18-92066, issue no. 1

Project / Site name:	Riverside MV	**Samples received on:**	11/07/2018
Your job number:	12236	**Samples instructed on:**	11/07/2018
Your order number:	12236/AF	**Analysis completed by:**	19/07/2018
Report Issue Number:	2	**Report issued on:**	19/07/2018
Samples Analysed:	2 soil samples		

Signed CCStone

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-92066

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				998528	998529			
Sample Reference				ES21	ES22			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				10/07/2018	10/07/2018			
Time Taken				1230	1240			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	22	< 0.1			
Moisture Content	%	N/A	NONE	8.1	9.6			
Total mass of sample received	kg	0.001	NONE	0.54	0.54			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8	6.8			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	590	130			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.16	0.0073			
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0			
Total Sulphur	mg/kg	50	MCERTS	300	75			
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	0.8			
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.2	1.9			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	0.19	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	0.22	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	0.20	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	8.2			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.76	0.73			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	0.8			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	13			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	29	15			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	52	9.7			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	24			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	19	15			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	66	52			

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-92066

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				998528	998529			
Sample Reference				ES21	ES22			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				10/07/2018	10/07/2018			
Time Taken				1230	1240			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-92066

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
998528	ES21	None Supplied	None Supplied	Brown clay and gravel with stones.
998529	ES22	None Supplied	None Supplied	Brown clay.

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Analytical Report Number : 18-92066

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-92066

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-92078

Project / Site name:	Riverside MV	**Samples received on:**	11/07/2018
Your job number:	12236	**Samples instructed on:**	11/07/2018
Your order number:	12236/AF	**Analysis completed by:**	19/07/2018
Report Issue Number:	1	**Report issued on:**	19/07/2018
Samples Analysed:	3 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-92078

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				998569	998570	998571		
Sample Reference				ES23	ES24	ES25		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				10/07/2018	10/07/2018	10/07/2018		
Time Taken				1030	1040	1050		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	12	9.7	9.5		
Total mass of sample received	kg	0.001	NONE	0.52	0.53	0.50		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.4	7.1	7.0		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	540	360	330		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.016	0.024	0.025		
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Total Sulphur	mg/kg	50	MCERTS	190	160	180		
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.9	0.7	0.7		
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.6	2.4	2.4		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80		

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Analytical Report Number: 18-92078

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				998569	998570	998571		
Sample Reference				ES23	ES24	ES25		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				10/07/2018	10/07/2018	10/07/2018		
Time Taken				1030	1040	1050		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	7.5	8.3		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.41	0.76	0.71		
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.5	1.1		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	24	21		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	14	14		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	20	20		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	27	24		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20	27	26		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	53	61	63		
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		

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Analytical Report Number : 18-92078

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
998569	ES23	None Supplied	None Supplied	Brown clay and sand.
998570	ES24	None Supplied	None Supplied	Brown sandy clay with vegetation.
998571	ES25	None Supplied	None Supplied	Brown sandy clay with vegetation.

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Analytical Report Number : 18-92078

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-92078

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 18-92576

Project / Site name:	Riverside MV	**Samples received on:**	16/07/2018
Your job number:	12236	**Samples instructed on:**	16/07/2018
Your order number:	12236-AF	**Analysis completed by:**	24/07/2018
Report Issue Number:	1	**Report issued on:**	24/07/2018
Samples Analysed:	6 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-92576

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1001030	1001031	1001032	1001033	1001034
Sample Reference				ES26	ES27	ES28	ES29	ES30
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.20	0.10	0.20
Date Sampled				13/07/2018	13/07/2018	13/07/2018	13/07/2018	13/07/2018
Time Taken				1030	1040	1050	1100	1110
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.7	10	11	9.1	16
Total mass of sample received	kg	0.001	NONE	0.54	0.54	0.55	0.57	0.54
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.5	6.6	6.6	6.7	6.5
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	230	190	220	230	410
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.018	0.012	0.0042	0.0082	0.062
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	110	99	110	110	190
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.4	0.3	1.0	0.9	0.4
Loss on Ignition @ 450°C	%	0.2	MCERTS	1.1	0.7	1.9	2.7	1.4
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	1.7	2.2	8.9	7.8	5.0
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.81	0.85	0.73	0.66	0.65
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.5	0.6	0.5	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	33	32	23	19	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	12	7.8	9.8	6.0
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.4	7.2	9.5	12	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31	31	28	26	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	40	43	20	17	24
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51	48	60	53	61

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-92576

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1001030	1001031	1001032	1001033	1001034
Sample Reference				ES26	ES27	ES28	ES29	ES30
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.20	0.10	0.20
Date Sampled				13/07/2018	13/07/2018	13/07/2018	13/07/2018	13/07/2018
Time Taken				1030	1040	1050	1100	1110
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 18-92576

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1001035				
Sample Reference				ES31				
Sample Number				None Supplied				
Depth (m)				0.10				
Date Sampled				13/07/2018				
Time Taken				1130				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	14				
Total mass of sample received	kg	0.001	NONE	0.56				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.1				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	420				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.053				
Sulphide	mg/kg	1	MCERTS	< 1.0				
Total Sulphur	mg/kg	50	MCERTS	200				
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7				
Loss on Ignition @ 450°C	%	0.2	MCERTS	1.7				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.7				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.68				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	9.0				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68				

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Analytical Report Number: 18-92576

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1001035				
Sample Reference				ES31				
Sample Number				None Supplied				
Depth (m)				0.10				
Date Sampled				13/07/2018				
Time Taken				1130				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

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Analytical Report Number : 18-92576

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1001030	ES26	None Supplied	0.20	Brown clay and sand with gravel and vegetation.
1001031	ES27	None Supplied	0.10	Brown clay and sand with gravel and vegetation.
1001032	ES28	None Supplied	0.20	Brown loam and clay with gravel.
1001033	ES29	None Supplied	0.10	Brown loam and clay with gravel.
1001034	ES30	None Supplied	0.20	Brown loam and clay with gravel.
1001035	ES31	None Supplied	0.10	Brown loam and clay with gravel.

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Analytical Report Number : 18-92576

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-92576

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-97325

Project / Site name:	Riverside MV	**Samples received on:**	22/08/2018
Your job number:	12236	**Samples instructed on:**	22/08/2018
Your order number:	12236-AF	**Analysis completed by:**	31/08/2018
Report Issue Number:	1	**Report issued on:**	31/08/2018
Samples Analysed:	2 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-97325

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1028487	1028488			
Sample Reference				ES32	ES33			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.20	0.10			
Date Sampled				21/08/2018	13/07/2018			
Time Taken				0830	0840			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	13	13			
Total mass of sample received	kg	0.001	NONE	0.59	0.47			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	8.7			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	1000	1100			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	0.12			
Sulphide	mg/kg	1	MCERTS	< 1.0	1.7			
Total Sulphur	mg/kg	50	MCERTS	350	400			
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.6	0.5			
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.2	2.2			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-97325

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1028487	1028488			
Sample Reference				ES32	ES33			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.20	0.10			
Date Sampled				21/08/2018	13/07/2018			
Time Taken				0830	0840			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.8	10			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.82	0.85			
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	1.3			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.5			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	42			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	23			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	22			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	25			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	36			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	99			
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

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Analytical Report Number : 18-97325

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1028487	ES32	None Supplied	0.20	Brown clay.
1028488	ES33	None Supplied	0.10	Brown clay and sand.

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Analytical Report Number : 18-97325

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-97325

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
ES33		S	18-97325	1028488	c	Hexavalent chromium in soil	L080-PL	c
ES33		S	18-97325	1028488	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
ES33		S	18-97325	1028488	c	Loss on ignition of soil @ 450oC	L047-PL	c
ES33		S	18-97325	1028488	c	Monohydric phenols in soil	L080-PL	c
ES33		S	18-97325	1028488	c	Organic matter (Automated) in soil	L009-PL	c
ES33		S	18-97325	1028488	c	Speciated EPA-16 PAHs in soil	L064-PL	c
ES33		S	18-97325	1028488	c	Sulphide in soil	L010-PL	c
ES33		S	18-97325	1028488	c	TPHCWG (Soil)	L088/76-PL	c
ES33		S	18-97325	1028488	c	Total cyanide in soil	L080-PL	c
ES33		S	18-97325	1028488	c	Total organic carbon (Automated) in soil	L009-PL	c
ES33		S	18-97325	1028488	c	pH in soil (automated)	L099-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 18-97866

Project / Site name:	Riverside MV	**Samples received on:**	28/08/2018
Your job number:	12236	**Samples instructed on:**	28/08/2018
Your order number:	12236-AF	**Analysis completed by:**	05/09/2018
Report Issue Number:	1	**Report issued on:**	05/09/2018
Samples Analysed:	1 soil sample		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-97866

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1031754				
Sample Reference				ES34				
Sample Number				None Supplied				
Depth (m)				0.20				
Date Sampled				24/08/2018				
Time Taken				0830				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	12				
Total mass of sample received	kg	0.001	NONE	0.54				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.4				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	300				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014				
Sulphide	mg/kg	1	MCERTS	< 1.0				
Total Sulphur	mg/kg	50	MCERTS	120				
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.6				
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.0				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.4				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.83				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	43				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	25				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120				

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Analytical Report Number: 18-97866

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1031754				
Sample Reference				ES34				
Sample Number				None Supplied				
Depth (m)				0.20				
Date Sampled				24/08/2018				
Time Taken				0830				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

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Analytical Report Number : 18-97866

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1031754	ES34	None Supplied	0.20	Brown clay and loam with gravel.

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Analytical Report Number : 18-97866

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-97866

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 18-99436

Project / Site name:	Riverside MV	**Samples received on:**	10/09/2018
Your job number:	12236	**Samples instructed on:**	10/09/2018
Your order number:	12236-AF	**Analysis completed by:**	18/09/2018
Report Issue Number:	1	**Report issued on:**	18/09/2018
Samples Analysed:	1 soil sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-99436

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1040959				
Sample Reference				ES35				
Sample Number				None Supplied				
Depth (m)				0.10				
Date Sampled				06/09/2018				
Time Taken				0930				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	13				
Total mass of sample received	kg	0.001	NONE	0.52				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	470				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.16				
Sulphide	mg/kg	1	MCERTS	< 1.0				
Total Sulphur	mg/kg	50	MCERTS	520				
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.6				
Loss on Ignition @ 450°C	%	0.2	MCERTS	4.3				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				

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Analytical Report Number: 18-99436

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				1040959				
Sample Reference				ES35				
Sample Number				None Supplied				
Depth (m)				0.10				
Date Sampled				06/09/2018				
Time Taken				0930				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.60				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.0				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	33				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	870				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	16				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49				
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

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Analytical Report Number : 18-99436

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1040959	ES35	None Supplied	0.10	Grey clay with gravel.

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Analytical Report Number : 18-99436

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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Analytical Report Number : 18-99436

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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APPENDIX F

SUMMARY OF CHEMICAL TEST RESULTS - SOILS (IMPORTATION)

INTERIM

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12236
Site: Riverside Merthyr Vale
Soil Type: Imported Natural Soils
Soil Organic Matter: 1%

METALS AND SEMI-METALS

No.	Location	Depth (m)	Arsenic (mg/kg)	Boron (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (Elemental) (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
1	B1	None Supplied	13	0.4	0.66	0.4	12	< 4.0	31	34	< 0.3	18	1.6	11	38
2	B2	None Supplied	15	0.5	0.84	0.3	15	< 4.0	44	60	0.4	22	1.2	17	68
3	B3	None Supplied	12	1.0	0.77	0.2	25	< 4.0	30	40	0.5	20	1.3	30	61
4	B4	None Supplied	14	0.6	0.77	0.5	11	< 4.0	30	33	< 0.3	20	< 1.0	15	50
5	ES5	None Supplied	9.0	< 0.2	0.47	< 0.2	14	< 4.0	14	8.7	< 0.3	19	< 1.0	13	44
6	ES6	None Supplied	13	1.1	0.46	< 0.2	21	< 4.0	13	17	< 0.3	21	3.3	23	59
7	ES7	None Supplied	9.2	0.6	0.40	< 0.2	20	< 4.0	27	13	< 0.3	22	3.3	24	61
8	ES8	None Supplied	7.9	0.3	0.59	< 0.2	16	< 4.0	7.3	19	< 0.3	16	< 1.0	25	52
9	ES9	None Supplied	6.5	0.3	0.64	< 0.2	18	< 4.0	8.6	17	< 0.3	19	< 1.0	24	57
10	ES10	None Supplied	10	0.3	0.94	< 0.2	18	< 4.0	14	13	< 0.3	32	< 1.0	19	66
11	ES11	None Supplied	11	0.5	0.82	< 0.2	13	< 4.0	14	18	< 0.3	27	4.3	15	62
12	ES12	None Supplied	23	< 0.2	0.85	0.7	18	< 4.0	37	39	< 0.3	22	< 1.0	15	47
13	ES13	None Supplied	20	0.4	0.83	0.6	14	< 4.0	36	36	< 0.3	24	1.8	15	39
14	ES14	None Supplied	18	0.6	0.71	< 0.2	19	< 4.0	22	16	< 0.3	28	1.9	22	73
15	ES15	None Supplied	21	0.2	0.64	< 0.2	17	< 4.0	19	19	< 0.3	26	1.8	23	74
16	ES16	0.10	12	0.5	0.76	< 0.2	16	< 4.0	22	13	< 0.3	28	1.6	20	65
17	ES17	0.10	9.7	0.6	0.44	< 0.2	14	< 4.0	19	13	< 0.3	20	< 1.0	19	48
18	ES18	0.10	11	0.9	0.35	< 0.2	16	< 4.0	18	19	< 0.3	16	1.5	24	50
19	ES19	0.10	9.4	0.5	0.41	< 0.2	19	< 4.0	15	14	< 0.3	17	< 1.0	22	52
20	ES20	0.10	8.8	0.6	0.39	< 0.2	19	< 4.0	14	14	< 0.3	18	1.7	21	51
21	ES21	None Supplied	17	0.9	0.76	< 0.2	16	< 4.0	29	52	0.6	26	< 1.0	19	66
22	ES22	None Supplied	8.2	0.8	0.73	< 0.2	13	< 4.0	15	9.7	< 0.3	24	< 1.0	15	52
23	ES23	None Supplied	11	0.5	0.41	< 0.2	23	< 4.0	13	12	< 0.3	25	< 1.0	20	53
24	ES24	None Supplied	7.5	0.5	0.76	< 0.2	24	< 4.0	14	20	< 0.3	27	< 1.0	27	61
25	ES25	None Supplied	8.3	1.1	0.71	< 0.2	21	< 4.0	14	20	< 0.3	24	< 1.0	26	63
26	ES26	0.20	1.7	0.5	0.81	< 0.2	33	< 4.0	13	9.4	< 0.3	31	< 1.0	40	51
27	ES27	0.10	2.2	0.5	0.85	< 0.2	32	< 4.0	12	7.2	< 0.3	31	< 1.0	43	48
28	ES28	0.20	8.9	0.6	0.73	< 0.2	23	< 4.0	7.8	9.5	< 0.3	28	< 1.0	20	60
29	ES29	0.10	7.8	0.5	0.66	< 0.2	19	< 4.0	9.8	12	< 0.3	26	< 1.0	17	53
30	ES30	0.20	5.0	0.6	0.65	0.2	21	< 4.0	6.0	14	< 0.3	21	< 1.0	24	61
31	ES31	0.10	7.7	0.5	0.68	0.2	20	< 4.0	9.0	20	< 0.3	22	< 1.0	28	68
32	ES32	0.20	9.8	1.2	0.82	0.4	29	< 4.0	19	20	< 0.3	25	< 1.0	28	72
33	ES33	0.10	10	1.3	0.85	0.5	42	< 4.0	23	22	< 0.3	25	< 1.0	36	99
34	ES34	0.20	6.4	0.4	0.83	0.7	21	< 4.0	18	43	< 0.3	24	< 1.0	25	120
35	ES35	0.10	16	0.8	0.60	2.0	16	< 4.0	33	870	< 0.3	17	< 1.0	16	49
	Screening Criteria Value		37.0	290.0	1.7	11.0	-	6.0	2400.0	200.0	1.2	130.0	250.0	410.0	3700.0
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	-	S4UL	S4UL	C4SL	S4UL	S4UL	S4UL	S4UL	S4UL

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Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12236
Site: Riverside Merthyr Vale
Soil Type: Imported Natural Soils
Soil Organic Matter: 1%

INORGANIC CHEMICALS & OTHERS

No.	Location	Depth (m)	Cyanide (mg/kg)	Loss on ignition, dried solids (%)	Moisture content at 30 C (%)	Phenol (mg/kg)	pH (pH units)	Water Soluble Sulphate (g/l)	Sulphate Total as SO4 (mg/kg)	Sulphide (mg/kg)	Total Sulphur (mg/kg)	TOC by Ignition in O2 (%)	Equivalent SOM (%)	Asbestos in Soil	Asbestos Quantification (%)
1	B1	None Supplied	< 1	0.9	3.9	< 1.0	8.5	0.017	1800	< 1.0	600	0.3	0.52	Not-detected	#N/A
2	B2	None Supplied	< 1	3.2	5.6	< 1.0	8.5	0.036	1900	4.6	820	1.2	2.06	Not-detected	#N/A
3	B3	None Supplied	< 1	4.7	8.3	< 1.0	9.9	0.39	2800	6.3	1100	2.4	4.13	Not-detected	#N/A
4	B4	None Supplied	< 1	1.5	4.2	< 1.0	10.8	0.13	1800	4.3	630	0.6	1.03	Not-detected	#N/A
5	ES5	None Supplied	< 1	1.7	8.1	< 1.0	8.0	0.012	140	< 1.0	78	0.6	1.03	Not-detected	#N/A
6	ES6	None Supplied	< 1	4.6	11	< 1.0	7.5	0.013	540	< 1.0	280	2.0	3.44	Not-detected	#N/A
7	ES7	None Supplied	< 1	3.1	15	< 1.0	7.8	0.015	360	< 1.0	210	1.2	2.06	Not-detected	#N/A
8	ES8	None Supplied	< 1	2.3	12	< 1.0	8.1	0.012	220	< 1.0	150	0.9	1.55	Not-detected	#N/A
9	ES9	None Supplied	< 1	1.8	6.4	< 1.0	8.2	0.035	400	< 1.0	220	0.4	0.69	Not-detected	#N/A
10	ES10	None Supplied	< 1	1.8	5.1	< 1.0	7.0	0.012	250	< 1.0	110	0.7	1.20	Not-detected	#N/A
11	ES11	None Supplied	< 1	2.2	4.6	< 1.0	7.9	0.013	260	< 1.0	130	1.0	1.72	Not-detected	#N/A
12	ES12	None Supplied	< 1	1.6	10	< 1.0	8.5	0.022	1300	2.1	440	0.3	0.52	Not-detected	#N/A
13	ES13	None Supplied	< 1	1.7	9.7	< 1.0	8.1	0.021	1400	1.2	600	0.3	0.52	Not-detected	#N/A
14	ES14	None Supplied	< 1	3.2	2.9	< 1.0	5.3	0.017	510	< 1.0	210	1.1	1.89	Not-detected	#N/A
15	ES15	None Supplied	< 1	2.9	2.7	< 1.0	5.3	0.067	380	< 1.0	200	1.0	1.72	Not-detected	#N/A
16	ES16	0.10	< 1	2.4	3.7	< 1.0	7.6	0.038	390	< 1.0	190	0.9	1.55	Not-detected	#N/A
17	ES17	0.10	< 1	2.3	11	< 1.0	7.3	0.020	340	< 1.0	160	0.9	1.55	Not-detected	#N/A
18	ES18	0.10	< 1	3.7	15	< 1.0	6.8	0.033	480	< 1.0	280	1.7	2.92	Not-detected	#N/A
19	ES19	0.10	< 1	3.0	15	< 1.0	7.2	0.016	370	< 1.0	190	1.2	2.06	Not-detected	#N/A
20	ES20	0.10	< 1	2.9	15	< 1.0	7.1	0.028	370	< 1.0	190	1.2	2.06	Not-detected	#N/A
21	ES21	None Supplied	< 1	2.2	8.1	< 1.0	7.8	0.16	590	< 1.0	300	0.7	1.20	Not-detected	#N/A
22	ES22	None Supplied	< 1	1.9	9.6	< 1.0	6.8	0.0073	130	< 1.0	75	0.8	1.38	Not-detected	#N/A
23	ES23	None Supplied	< 1	2.6	12	< 1.0	7.4	0.016	540	< 1.0	190	0.9	1.55	Not-detected	#N/A
24	ES24	None Supplied	< 1	2.4	9.7	< 1.0	7.1	0.024	360	< 1.0	160	0.7	1.20	Not-detected	#N/A
25	ES25	None Supplied	< 1	2.4	9.5	< 1.0	7.0	0.025	330	< 1.0	180	0.7	1.20	Not-detected	#N/A
26	ES26	0.20	< 1	1.1	9.7	< 1.0	6.5	0.018	230	< 1.0	110	0.4	0.69	Not-detected	#N/A
27	ES27	0.10	< 1	0.7	10	< 1.0	6.6	0.012	190	< 1.0	99	0.3	0.52	Not-detected	#N/A
28	ES28	0.20	< 1	1.9	11	< 1.0	6.6	0.0042	220	< 1.0	110	1.0	1.72	Not-detected	#N/A
29	ES29	0.10	< 1	2.7	9.1	< 1.0	6.7	0.0082	230	< 1.0	110	0.9	1.55	Not-detected	#N/A
30	ES30	0.20	< 1	1.4	16	< 1.0	6.5	0.062	410	< 1.0	190	0.4	0.69	Not-detected	#N/A
31	ES31	0.10	< 1	1.7	14	< 1.0	7.1	0.053	420	< 1.0	200	0.7	1.20	Not-detected	#N/A
32	ES32	0.20	< 1	2.2	13	< 1.0	8.5	0.12	1000	< 1.0	350	0.6	1.03	Not-detected	#N/A
33	ES33	0.10	< 1	2.2	13	< 1.0	8.7	0.12	1100	1.7	400	0.5	0.86	Not-detected	#N/A
34	ES34	0.20	< 1	2.0	12	< 1.0	7.4	0.014	300	< 1.0	120	0.6	1.03	Not-detected	#N/A
35	ES35	0.10	< 1	4.3	13	< 1.0	7.6	0.16	470	< 1.0	520	0.6	1.03	Not-detected	#N/A
	Screening Criteria Value		34.0	-	-	280.0	-	-	-	-	-	-	-	-	0.001
	Source of Screening Criteria Value		ATRISK	-	-	S4UL	-	-	-	-	-	-	-	-	IOM

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Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12236
Site: Riverside Merthyr Vale
Soil Type: Imported Natural Soils
Soil Organic Matter: 1%

POLYAROMATIC HYDROCARBONS (PAH)

No.	Location	Depth (m)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(ghi)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(ah)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(123cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
1	B1	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2	B2	None Supplied	< 0.05	< 0.05	< 0.05	0.33	0.35	0.47	< 0.05	0.17	0.40	< 0.05	0.72	< 0.05	< 0.05	< 0.05	0.54	0.54
3	B3	None Supplied	< 0.05	< 0.05	< 0.05	0.28	0.27	0.41	< 0.05	0.16	0.34	< 0.05	0.47	< 0.05	< 0.05	< 0.05	0.26	0.40
4	B4	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
5	ES5	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
6	ES6	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
7	ES7	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
8	ES8	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
9	ES9	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
10	ES10	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
11	ES11	None Supplied	< 0.05	< 0.05	< 0.05	0.19	< 0.05	< 0.05	< 0.05	< 0.05	0.27	< 0.05	0.50	< 0.05	< 0.05	< 0.05	0.36	0.41
12	ES12	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
13	ES13	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
14	ES14	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
15	ES15	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
16	ES16	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
17	ES17	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
18	ES18	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
19	ES19	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
20	ES20	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
21	ES21	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.22	< 0.05	< 0.05	< 0.05	0.19	0.20
22	ES22	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
23	ES23	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
24	ES24	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
25	ES25	None Supplied	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
26	ES26	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
27	ES27	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
28	ES28	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
29	ES29	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
30	ES30	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
31	ES31	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
32	ES32	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
33	ES33	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
34	ES34	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
35	ES35	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Screening Criteria Value		210.0	170.0	2400.0	7.2	2.2	2.6	320.0	77.0	15.0	0.2	280.0	170.0	27.0	2.3	95.0	620.0
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL

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Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12236
Site: Riverside Merthyr Vale
Soil Type: Imported Natural Soils
Soil Organic Matter: 1%

PETROLEUM HYDROCARBONS

No.	Location	Depth (m)	Aliphatic C5-C6 (mg/kg)	Aliphatic C6-C8 (mg/kg)	Aliphatic C8-C10 (mg/kg)	Aliphatic C10-C12 EPH (mg/kg)	Aliphatic C12-C16 EPH (mg/kg)	Aliphatic C16-C35 EPH (mg/kg)	Aromatic C5-C7 (mg/kg)	Aromatic C7-C8 (mg/kg)	Aromatic C8-C10 (mg/kg)	Aromatic C10-C12 EPH (mg/kg)	Aromatic C12-C16 EPH (mg/kg)	Aromatic C16-C21 EPH (mg/kg)	Aromatic C21-C35 EPH (mg/kg)
1	B1	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	2.6	88	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	11	23
2	B2	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	24	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	38
3	B3	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	23	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	52
4	B4	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	46
5	ES5	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
6	ES6	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
7	ES7	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
8	ES8	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
9	ES9	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	2.0	22	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
10	ES10	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
11	ES11	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	1.6	3.4	< 10	17
12	ES12	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
13	ES13	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
14	ES14	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
15	ES15	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
16	ES16	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
17	ES17	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
18	ES18	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
19	ES19	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
20	ES20	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
21	ES21	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
22	ES22	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
23	ES23	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
24	ES24	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
25	ES25	None Supplied	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
26	ES26	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
27	ES27	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
28	ES28	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
29	ES29	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
30	ES30	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
31	ES31	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
32	ES32	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
33	ES33	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
34	ES34	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
35	ES35	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
	Screening Criteria Value		42.0	100.0	27.0	130.0	1100.0	65000.0	0.1	130.0	34.0	74.0	140.0	260.0	1100.0
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL

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Intégral Géotechnique

APPENDIX G

CHEMICAL TEST RESULTS – LEACHATES (IMPORTATION)

INTERIM

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Analytical Report Number : 18-90085

Replaces Analytical Report Number : 18-90085, issue no. 2

Project / Site name:	Riverside MV	**Samples received on:**	25/06/2018
Your job number:	12236	**Samples instructed on:**	25/06/2018
Your order number:	12236-AF	**Analysis completed by:**	11/07/2018
Report Issue Number:	3	**Report issued on:**	11/07/2018
Samples Analysed:	5 leachate samples - 5 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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

Analytical Report Number: 18-90085

Project / Site name: Riverside MV
Your Order No: 12236-AF

Lab Sample Number				987971	987972	987973	987974	987975
Sample Reference				L1	L2	L3	L4	L5
Sample Number				Stockpile	Stockpile	Stockpile	Stockpile	Stockpile
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				21/06/2018	21/06/2018	21/06/2018	21/06/2018	21/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	26	35	41	46
Moisture Content	%	N/A	NONE	4.9	8.7	8.1	5.7	4.2
Total mass of sample received	kg	0.001	NONE	2.0	1.9	1.8	2.0	1.8
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	9.9	29	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	10	34	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	5.8	1.2	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	13	7.1	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	20	16	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	91	92	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	15	130	120	< 10	< 10

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90085

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				987976	987977	987978	987979	987980
Sample Reference				L1	L2	L3	L4	L5
Sample Number				Stockpile	Stockpile	Stockpile	Stockpile	Stockpile
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				21/06/2018	21/06/2018	21/06/2018	21/06/2018	21/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.0	7.9	7.8	6.2	6.2
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	100	ISO 17025	11200	4840	10700	1470	7890
Total Sulphur	µg/l	15	NONE	3700	1600	3600	490	2600
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Organic Carbon (TOC)	mg/l	0.1	NONE	5.35	5.49	6.32	8.51	6.84
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	< 1.1	1.3	2.2	< 1.1
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	< 10	11	13	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.0	1.3	0.8	2.4	3.1
Copper (dissolved)	µg/l	0.7	ISO 17025	7.6	11	11	22	10
Lead (dissolved)	µg/l	1	ISO 17025	3.7	3.6	5.2	4.8	2.9
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.9	1.0	1.0	2.0	< 0.3
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	3.9	< 1.7	3.5
Zinc (dissolved)	µg/l	0.4	ISO 17025	3.7	6.8	3.9	7.4	4.4

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Analytical Report Number: 18-90085

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				987976	987977	987978	987979	987980
Sample Reference				L1	L2	L3	L4	L5
Sample Number				Stockpile	Stockpile	Stockpile	Stockpile	Stockpile
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				21/06/2018	21/06/2018	21/06/2018	21/06/2018	21/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number : 18-90085

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
987971	L1	Stockpile	None Supplied	Light brown loam and sand with gravel and vegetation.
987972	L2	Stockpile	None Supplied	Brown sandy clay with stones and gravel
987973	L3	Stockpile	None Supplied	Brown clay and sand with stones and gravel
987974	L4	Stockpile	None Supplied	Brown loam and sand with stones and vegetation.
987975	L5	Stockpile	None Supplied	Brown loam and sand with stones and vegetation.

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Analytical Report Number : 18-90085

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

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Analytical Report Number : 18-90085

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-90130

Replaces Analytical Report Number : 18-90130, issue no. 2

Project / Site name:	Riverside MV	**Samples received on:**	25/06/2018
Your job number:	12236	**Samples instructed on:**	25/06/2018
Your order number:	12236/AF	**Analysis completed by:**	11/07/2018
Report Issue Number:	3	**Report issued on:**	11/07/2018
Samples Analysed:	1 leachate sample - 1 soil sample		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90130

Project / Site name: Riverside MV
Your Order No: 12236/AF

Lab Sample Number				988232				
Sample Reference				L6				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				22/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	10				
Total mass of sample received	kg	0.001	NONE	1.9				

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

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Analytical Report Number: 18-90130

Project / Site name: Riverside MV

Your Order No: 12236/AF

Lab Sample Number				988233				
Sample Reference				L6				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				22/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.5				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	100	ISO 17025	4190				
Total Sulphur	µg/l	15	NONE	1400				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	NONE	7.00				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	2.1				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.3				
Copper (dissolved)	µg/l	0.7	ISO 17025	11				
Lead (dissolved)	µg/l	1	ISO 17025	2.2				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.7				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Zinc (dissolved)	µg/l	0.4	ISO 17025	7.0				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90130

Project / Site name: Riverside MV

Your Order No: 12236/AF

Lab Sample Number				988233				
Sample Reference				L6				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				22/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

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Analytical Report Number : 18-90130

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
988232	L6	Stockpile	None Supplied	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 18-90130

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

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Analytical Report Number : 18-90130

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-90396

Project / Site name:	Riverside MV	**Samples received on:**	27/06/2018
Your job number:	12236	**Samples instructed on:**	27/06/2018
Your order number:	12236-AF	**Analysis completed by:**	05/07/2018
Report Issue Number:	1	**Report issued on:**	05/07/2018
Samples Analysed:	1 leachate sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90396

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				989528				
Sample Reference				L7				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				26/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.6				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	100	ISO 17025	5360				
Total Sulphur	µg/l	15	NONE	1800				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	NONE	4.93				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	1.5				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4				
Copper (dissolved)	µg/l	0.7	ISO 17025	5.7				
Lead (dissolved)	µg/l	1	ISO 17025	3.0				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.2				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Zinc (dissolved)	µg/l	0.4	ISO 17025	6.6				

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Analytical Report Number: 18-90396

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				989528				
Sample Reference				L7				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				26/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

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Analytical Report Number : 18-90396

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-90989

Project / Site name:	Riverside MV	**Samples received on:**	02/07/2018
Your job number:	12236	**Samples instructed on:**	02/07/2018
Your order number:	12236-AF	**Analysis completed by:**	09/07/2018
Report Issue Number:	1	**Report issued on:**	09/07/2018
Samples Analysed:	1 leachate sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90989

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				992791				
Sample Reference				L8				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				27/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	8.0				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	100	ISO 17025	5580				
Total Sulphur	µg/l	15	NONE	1900				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	NONE	4.77				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.7				
Copper (dissolved)	µg/l	0.7	ISO 17025	2.5				
Lead (dissolved)	µg/l	1	ISO 17025	1.4				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.0				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.1				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90989

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				992791				
Sample Reference				L8				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				27/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-90989

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 18-90938

Project / Site name:	Riverside MV	**Samples received on:**	02/07/2018
Your job number:	12236	**Samples instructed on:**	02/07/2018
Your order number:	12236-AF	**Analysis completed by:**	06/07/2018
Report Issue Number:	1	**Report issued on:**	06/07/2018
Samples Analysed:	1 leachate sample		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90938

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				992497				
Sample Reference				L9				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				28/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.0				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	100	ISO 17025	3380				
Total Sulphur	µg/l	15	NONE	1100				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	NONE	3.88				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-90938

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				992497				
Sample Reference				L9				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				28/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	2.0				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.8				
Copper (dissolved)	µg/l	0.7	ISO 17025	2.6				
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.7				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.1				
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

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Analytical Report Number : 18-90938

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-91170

Project / Site name:	Riverside MV	**Samples received on:**	03/07/2018
Your job number:	12236	**Samples instructed on:**	03/07/2018
Your order number:	12236-AF	**Analysis completed by:**	11/07/2018
Report Issue Number:	1	**Report issued on:**	11/07/2018
Samples Analysed:	1 leachate sample		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-91170

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				993712				
Sample Reference				L10				
Sample Number				None Supplied				
Depth (m)				0.10				
Date Sampled				02/07/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.2				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	100	ISO 17025	2290				
Total Sulphur	µg/l	15	NONE	760				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	NONE	8.55				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	4.0				
Copper (dissolved)	µg/l	0.7	ISO 17025	8.4				
Lead (dissolved)	µg/l	1	ISO 17025	1.1				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.9				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	4.4				
Zinc (dissolved)	µg/l	0.4	ISO 17025	6.2				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-91170

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				993712				
Sample Reference				L10				
Sample Number				None Supplied				
Depth (m)				0.10				
Date Sampled				02/07/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-91170

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-91497

Project / Site name:	Riverside MV	**Samples received on:**	05/07/2018
Your job number:	12236	**Samples instructed on:**	05/07/2018
Your order number:	12236-AF	**Analysis completed by:**	13/07/2018
Report Issue Number:	1	**Report issued on:**	13/07/2018
Samples Analysed:	1 leachate sample		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-91497

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				995410				
Sample Reference				L11				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				04/07/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	6.7				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	100	ISO 17025	2210				
Total Sulphur	µg/l	15	NONE	740				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	NONE	11.7				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.6				
Copper (dissolved)	µg/l	0.7	ISO 17025	26				
Lead (dissolved)	µg/l	1	ISO 17025	4.1				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.8				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	2.1				
Zinc (dissolved)	µg/l	0.4	ISO 17025	15				

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Analytical Report Number: 18-91497

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				995410				
Sample Reference				L11				
Sample Number				Stockpile				
Depth (m)				None Supplied				
Date Sampled				04/07/2018				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

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Analytical Report Number : 18-91497

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-92076

Project / Site name:	Riverside MV	**Samples received on:**	11/07/2018
Your job number:	12236	**Samples instructed on:**	11/07/2018
Your order number:	12236/AF	**Analysis completed by:**	17/07/2018
Report Issue Number:	1	**Report issued on:**	17/07/2018
Samples Analysed:	2 leachate samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-92076

Project / Site name: Riverside MV

Your Order No: 12236/AF

Lab Sample Number				998555	998556			
Sample Reference				L12	L13			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				10/07/2018	10/07/2018			
Time Taken				1000	1100			
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.1	7.4			
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Sulphate as SO_4	µg/l	100	ISO 17025	1500	1730			
Total Sulphur	µg/l	15	NONE	500	580			
Sulphide	µg/l	5	NONE	< 5.0	< 5.0			
Total Organic Carbon (TOC)	mg/l	0.1	NONE	10.3	5.66			
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10			
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01			
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2			
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	< 1.1			
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10			
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08			
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0			
Chromium (dissolved)	µg/l	0.4	ISO 17025	5.6	0.9			
Copper (dissolved)	µg/l	0.7	ISO 17025	22	5.8			
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0			
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5			
Nickel (dissolved)	µg/l	0.3	ISO 17025	4.2	1.1			
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0			
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7			
Zinc (dissolved)	µg/l	0.4	ISO 17025	11	3.9			

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Analytical Report Number: 18-92076

Project / Site name: Riverside MV

Your Order No: 12236/AF

Lab Sample Number				998555	998556			
Sample Reference				L12	L13			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				10/07/2018	10/07/2018			
Time Taken				1000	1100			
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

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Analytical Report Number : 18-92076

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-92577

Project / Site name:	Riverside MV	**Samples received on:**	16/07/2018
Your job number:	12236	**Samples instructed on:**	16/07/2018
Your order number:	12236-AF	**Analysis completed by:**	24/07/2018
Report Issue Number:	1	**Report issued on:**	24/07/2018
Samples Analysed:	3 leachate samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-92577

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				1001036	1001037	1001038		
Sample Reference				L14	L15	L16		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.20	0.10	0.20		
Date Sampled				13/07/2018	13/07/2018	13/07/2018		
Time Taken				1000	1030	1100		
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.2	7.0	7.0		
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10		
Sulphate as SO_4	µg/l	100	ISO 17025	2640	1390	4810		
Total Sulphur	µg/l	15	NONE	880	460	1600		
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0		
Total Organic Carbon (TOC)	mg/l	0.1	NONE	4.08	4.06	5.14		
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10		
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2		
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	< 1.1	2.8		
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	0.2		
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10		
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08		
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0	< 5.0		
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.1	1.2	3.2		
Copper (dissolved)	µg/l	0.7	ISO 17025	2.6	3.2	6.9		
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	3.0		
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5		
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.1	1.2	3.2		
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0		
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	2.4		
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.0	4.8	9.5		

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-92577

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				1001036	1001037	1001038		
Sample Reference				L14	L15	L16		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.20	0.10	0.20		
Date Sampled				13/07/2018	13/07/2018	13/07/2018		
Time Taken				1000	1030	1100		
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-92577

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-97304

Project / Site name:	Riverside MV	**Samples received on:**	22/08/2018
Your job number:	12236	**Samples instructed on:**	22/08/2018
Your order number:	12236-AF	**Analysis completed by:**	31/08/2018
Report Issue Number:	1	**Report issued on:**	31/08/2018
Samples Analysed:	1 leachate sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-97304

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				1028314				
Sample Reference				L17				
Sample Number				None Supplied				
Depth (m)				0.10				
Date Sampled				13/07/2018				
Time Taken				0900				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	8.5				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	100	ISO 17025	13900				
Total Sulphur	µg/l	15	NONE	4600				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	NONE	6.38				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	2.8				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	33				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	3.2				
Copper (dissolved)	µg/l	0.7	ISO 17025	14				
Lead (dissolved)	µg/l	1	ISO 17025	15				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.7				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	5.0				
Zinc (dissolved)	µg/l	0.4	ISO 17025	52				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-97304

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				1028314				
Sample Reference				L17				
Sample Number				None Supplied				
Depth (m)				0.10				
Date Sampled				13/07/2018				
Time Taken				0900				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

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Analytical Report Number : 18-97304

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-97863

Project / Site name:	Riverside MV	**Samples received on:**	28/08/2018
Your job number:	12236	**Samples instructed on:**	28/08/2018
Your order number:	12236-AF	**Analysis completed by:**	05/09/2018
Report Issue Number:	1	**Report issued on:**	05/09/2018
Samples Analysed:	1 leachate sample		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-97863

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				1031745				
Sample Reference				L18				
Sample Number				None Supplied				
Depth (m)				0.20				
Date Sampled				24/08/2018				
Time Taken				0900				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.8				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	100	ISO 17025	2620				
Total Sulphur	µg/l	15	NONE	870				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	NONE	4.35				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1				
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	µg/l	10	ISO 17025	< 10				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.7				
Copper (dissolved)	µg/l	0.7	ISO 17025	4.3				
Lead (dissolved)	µg/l	1	ISO 17025	1.2				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.0				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7				
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.0				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-97863

Project / Site name: Riverside MV

Your Order No: 12236-AF

Lab Sample Number				1031745				
Sample Reference				L18				
Sample Number				None Supplied				
Depth (m)				0.20				
Date Sampled				24/08/2018				
Time Taken				0900				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-97863

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total Sulphur in leachates	Determination of total sulphur in leachates by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

APPENDIX H

SUMMARY OF CHEMICAL TEST RESULTS – LEACHATES (IMPORTATION)

INTERIM

Summary of Leachate Results - Riverside Merthyr Vale

12236/AF/18

	Determinand	Unit	Sample Location											Guideline Value		
			L1	L2	L3	L4	L5	L6	L7	L8	L9	L10 @ 0.10m	L11	MAC-EQS Inland Surface Water C3	Freshwater EQS >100-150mg/l CaCO3	UK Drinking Water Standards
Metals and Non-Metals	Arsenic	ug/l	< 1.1	< 1.1	1.30	2.20	< 1.1	2.10	1.50	< 1.1	2.00	< 1.1	< 1.1	-	50	10
	Beryllium	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-	-
	Cadmium	ug/l	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	0.6	5	5
	Chromium	ug/l	1.00	1.30	0.80	2.40	3.10	1.30	< 0.4	1.70	2.80	4.00	2.60	-	20	50
	Copper	ug/l	7.60	**11.00**	**11.00**	**22.00**	10.00	**11.00**	5.70	2.50	2.60	8.40	**26.00**	-	10	2000
	Cyanide	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	-	50
	Lead	ug/l	3.70	3.60	5.20	4.80	2.90	2.20	3.00	1.40	< 1.0	1.10	4.10	14	10	10
	Mercury	ug/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.07	1	-
	Nickel	ug/l	0.90	1.00	1.00	2.00	< 0.3	0.70	1.20	1.00	2.70	2.90	2.80	34	150	20
	pH	pH Units	7.00	7.90	7.80	6.20	6.20	7.50	7.60	8.00	7.00	7.20	6.70	-	-	-
	Phenols Mono (Phenol Index)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	30	0.5
	Selenium	ug/l	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	-	-	10
	Sulphate as SO4	ug/l	11200.00	4840.00	10700.00	1470.00	7890.00	4190.00	5360.00	5580.00	3380.00	2290.00	2210.00	-	400000	250000
	Sulphide	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	-	0.25	-
	Vanadium	ug/l	< 1.7	< 1.7	3.90	< 1.7	3.50	< 1.7	< 1.7	< 1.7	< 1.7	4.40	2.10	-	20	-
	Zinc	ug/l	3.70	6.80	3.90	7.40	4.40	7.00	6.60	5.10	5.10	6.20	15.00	-	75	5000
PAH	Acenaphthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Acenaphthylene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.1	10	-
	Benzo (a) anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Benzo (g,h,i) perylene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0082	10	-
	Benzo (a) pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.27	10	0.01
	Benzo (b) fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.017	10	-
	Benzo (k) fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.017	10	-
	Chrysene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Dibenz (a,h) anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.12	10	-
	Fluorene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Indeno (1,2,3) cd pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Naphthalene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	130	10	-
	Phenanthrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	PAH, Total	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-	0.1
VPH/EPH	Aliphatic VPH >C5 - C6	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aliphatic VPH >C6 - C8	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aliphatic VPH >C8 - 10	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aliphatic EPH >C10 - C12	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aliphatic EPH >C12 - C16	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aliphatic EPH >C16 - C21	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aliphatic EPH >C21 - C35	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aromatic VPH >C5 - C7	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aromatic VPH >C7 - C8	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aromatic VPH >C8 - C10	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aromatic EPH >C10 - C12	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aromatic EPH >C12 - C16	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aromatic EPH >C16 - C21	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aromatic EPH >C21 - C35	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1

Notes:
EQS for Naphthalene used for all PAH compounds
EQS for Benzene used for all VPH/EPH compounds

Hardness value of *** used to determine MAC-EQS Class and Freshwater EQS Hardness Band, based on available data for ***.

Results exceeding the MAC-EQS value, or the most conservative EQS/UKDWS guideline value where MAC values are unavailable, are highlighted **red bold type**

MAC-EQS values sourced from Water Framework Directive

Freshwater EQS values sourced from Council Directive on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community (Dangerous Substances Directive) - List I and List II substances

Intégral Géotechnique

	Determinand	Unit	Sample Location								Guideline Value		
			L12	L13	L14 @ 0.20m	L15 @ 0.10m	L16 @ 0.20m	L17 @ 0.10m	L18 @ 0.20m	L19 @ 0.10m	MAC-EQS Inland Surface Water C3	Freshwater EQS >100-150mg/l CaCO3	UK Drinking Water Standards
Metals and Non-Metals	Arsenic	ug/l	< 1.1	< 1.1	< 1.1	< 1.1	2.80	2.80	< 1.1	< 1.1	-	50	10
	Beryllium	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	0.20	< 0.2	< 0.2	< 0.2	-	-	-
	Cadmium	ug/l	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	0.6	5	5
	Chromium	ug/l	5.60	0.90	1.10	1.20	3.20	3.20	0.70	0.60	-	20	50
	Copper	ug/l	**22.00**	5.80	2.60	3.20	6.90	**14.00**	4.30	7.10	-	10	2000
	Cyanide	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	-	50
	Lead	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	3.00	**15.00**	1.20	4.70	14	10	10
	Mercury	ug/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.07	1	-
	Nickel	ug/l	4.20	1.10	1.10	1.20	3.20	0.70	2.00	1.00	34	150	20
	pH	pH Units	7.10	7.40	7.20	7.00	7.00	8.50	7.80	8.00	-	-	-
	Phenols Mono (Phenol Index)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	30	0.5
	Selenium	ug/l	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	-	-	10
	Sulphate as SO4	ug/l	1500.00	1730.00	2640.00	1390.00	4810.00	13900.00	2620.00	19000.00	-	400000	250000
	Sulphide	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	-	0.25	-
	Vanadium	ug/l	< 1.7	< 1.7	< 1.7	< 1.7	2.40	5.00	< 1.7	< 1.7	-	20	-
	Zinc	ug/l	11.00	3.90	5.00	4.80	9.50	52.00	5.00	3.80	-	75	5000
PAH	Acenaphthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Acenaphthylene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.1	10	-
	Benzo (a) anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Benzo (g,h,i) perylene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0082	10	-
	Benzo (a) pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.27	10	0.01
	Benzo (b) fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.017	10	-
	Benzo (k) fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.017	10	-
	Chrysene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Dibenz (a,h) anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.12	10	-
	Fluorene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Indeno (1,2,3) cd pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Naphthalene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	130	10	-
	Phenanthrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	Pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	10	-
	PAH, Total	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-	0.1
VPH/EPH	Aliphatic VPH >C5 - C6	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aliphatic VPH >C6 - C8	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aliphatic VPH >C8 - 10	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aliphatic EPH >C10 - C12	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aliphatic EPH >C12 - C16	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aliphatic EPH >C16 - C21	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aliphatic EPH >C21 - C35	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aromatic VPH >C5 - C7	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aromatic VPH >C7 - C8	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aromatic VPH >C8 - C10	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50	-	1
	Aromatic EPH >C10 - C12	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aromatic EPH >C12 - C16	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aromatic EPH >C16 - C21	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1
	Aromatic EPH >C21 - C35	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	50	-	1

Notes:
EQS for Naphthalene used for all PAH compounds
EQS for Benzene used for all VPH/EPH compounds

Hardness value of *** used to determine MAC-EQS Class and Freshwater EQS Hardness Band, based on available data for ***.

Results exceeding the MAC-EQS value, or the most conservative EQS/UKDWS guideline value where MAC values are unavailable, are highlighted in **red bold type**

MAC-EQS values sourced from Water Framework Directive

Freshwater EQS values sourced from Council Directive on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community (Dangerous Substances Directive) - List I and List II substances

APPENDIX I

LABORATORY GEOTECHNICAL TEST RESULTS (DURING TURN AND COMPACT/IMPORTATION)

INTERIM

Laboratory Report

GEO Site & Testing Services Ltd

Contract Number: 39446

Client Ref: **12236**
Client PO: **12236**

Report Date: **18-06-2018**

Client **Integral Geotechnique (Wales) Limited**
7 Beddau Way
Castlegate Business Park
Caerphilly
Cardiff
CF83 2AX

Contract Title: **Riverside MV**
For the attention of: **Jack Jones**

Date Received: **29-05-2018**
Date Commenced: **29-05-2018**
Date Completed: **18-06-2018**

Test Description	Qty
Moisture Content BS 1377 : Part 2 : 3.2 - * UKAS	4
4 Point Liquid & Plastic Limit (LL/PL) BS 1377 Part 2 : 4.3 & 5.3 - * UKAS	4
PSD Wet Sieve method BS 1377 : 1990 Part 2 : 9.2 - * UKAS	4
Dry Den/MC (2.5kg Rammer Method 1 Litre Mould) BS1377 : 1990 Part 4 : 3.3 - * UKAS	4
Disposal of Samples on Project	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

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 Signatories:
Alex Wynn (Associate Director) - Ben Sharp (Contracts Manager) - Emma Sharp (Office Manager)
Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) - Sean Penn (Administrative/Accounts Assistant)
Wayne Honey (Administrative/Quality Assistant)

GEO Site & Testing Services Ltd
Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GSTL	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377 : Part 2 : 1990 Method 5)	
Contract Number	**39446**	
Site Name	**Riverside MV**	

Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing .425mm %	Remarks
WDL B1		B	ST/P	-		3	24	16	8	22	CL Low Plasticity
WDL B2		B	ST/P	-		4	26	17	9	34	CL Low Plasticity
WDL B3		B	ST/P	-		12	27	16	11	47	CL Low Plasticity
WDL B4		B	ST/P	-		8	25	14	11	7	CL Low Plasticity
				-							
				-							
				-							
				-							
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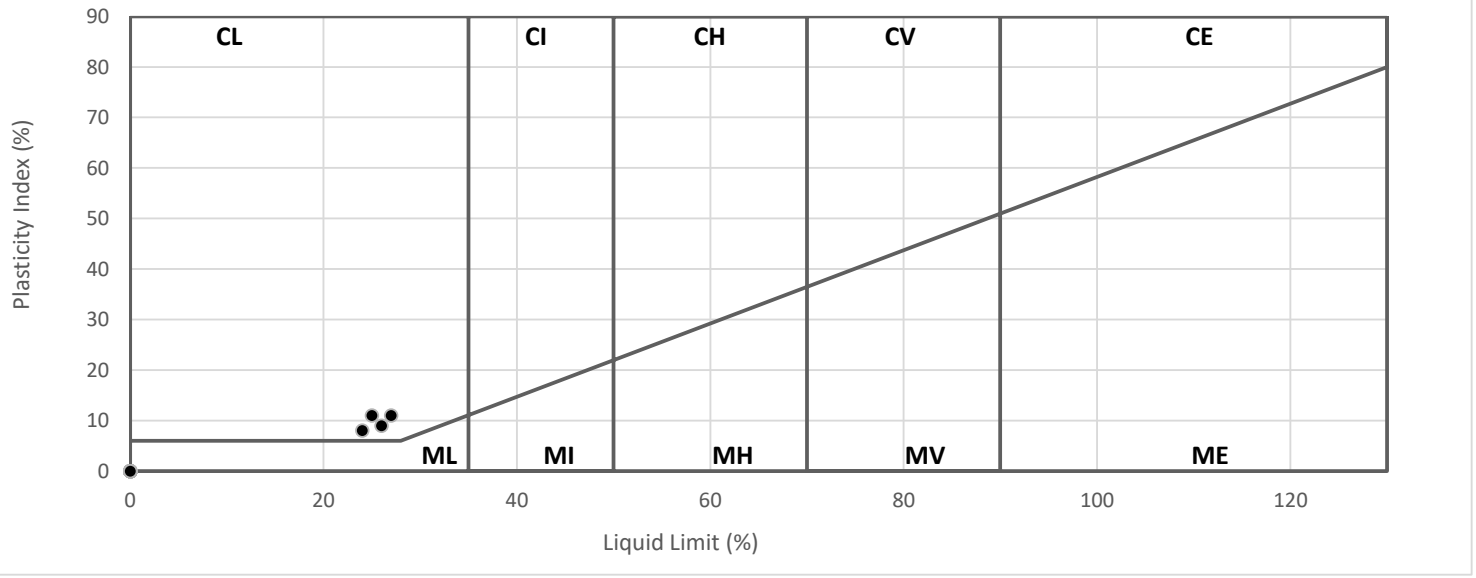
				-							
				-							

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

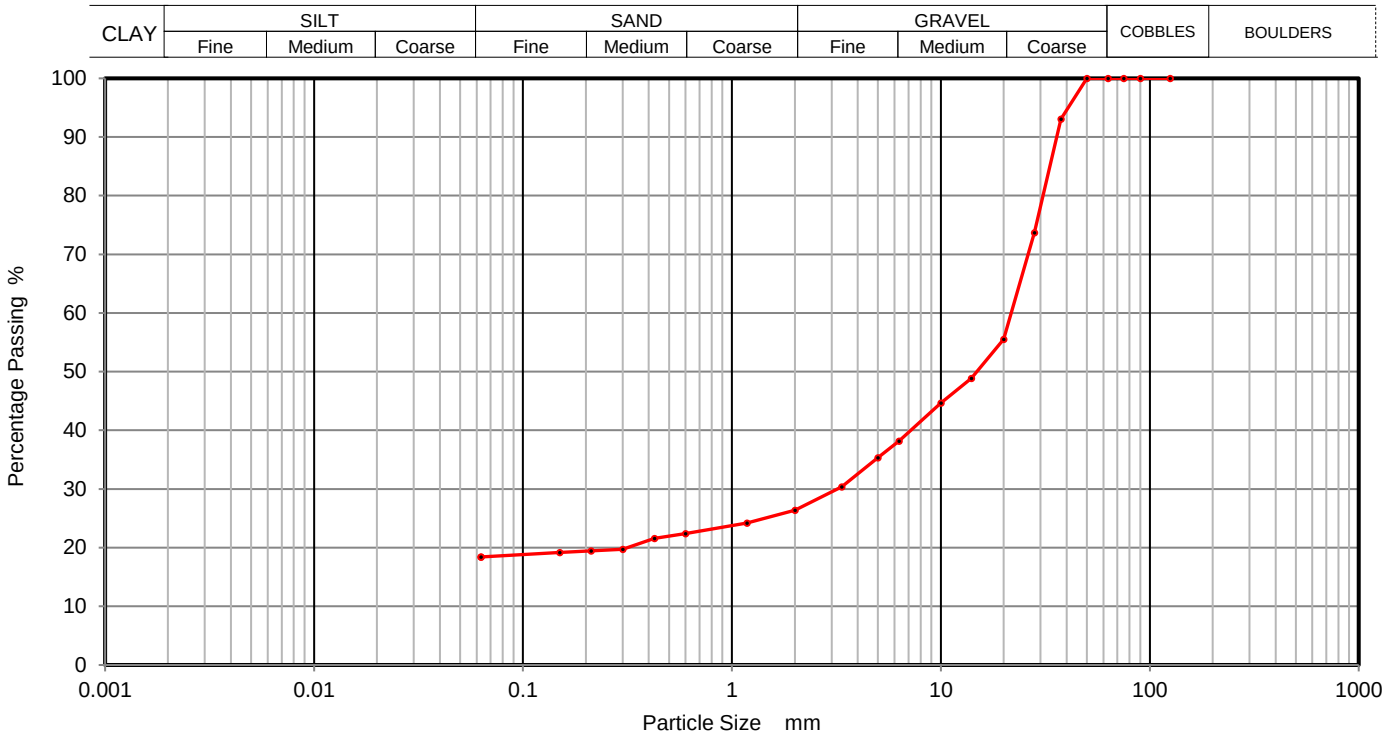
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010



Operators	Checked	17/06/2018	Wayne Honey	W. Honey
DB	Approved	18/06/2018	Ben Sharp	

UKAS TESTING

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	**39446**
		Borehole/Pit No.	**WDL B1**
Site Name	**Riverside MV**	Sample No.	
Soil Description	Brown slightly fine to coarse sandy silty/ clayey fine to coarse GRAVEL	Depth Top	**ST/P**
		Depth Base	
		Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	93		
28	74		
20	56		
14	49		
10	45		
6.3	38		
5	35		
3.35	30		
2	26		
1.18	24		
0.6	22		
0.425	22		
0.3	20		
0.212	19		
0.15	19		
0.063	18		

Sample Proportions	% dry mass
Cobbles	0
Gravel	74
Sand	8
Silt and Clay	18

Grading Analysis	
Uniformity Coefficient	

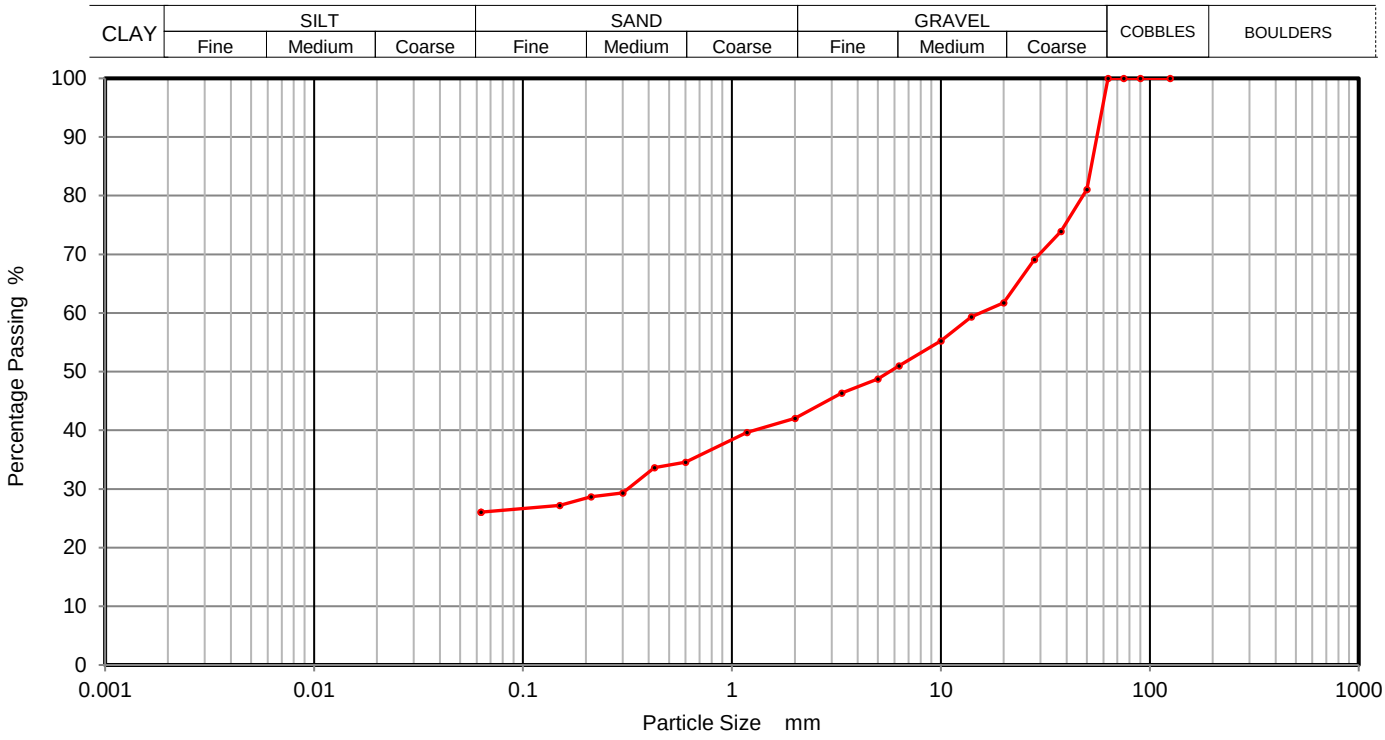
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17/06/2018	Wayne Honey	W. Honey
RO/MH	Approved	18/06/2018	Ben Sharp	

UKAS TESTING

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	**39446**
		Borehole/Pit No.	**WDL B2**
Site Name	**Riverside MV**	Sample No.	
Soil Description	Brown fine to coarse sandy silty/ clayey fine to coarse GRAVEL	Depth Top	**ST/P**
		Depth Base	
		Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	81		
37.5	74		
28	69		
20	62		
14	59		
10	55		
6.3	51		
5	49		
3.35	46		
2	42		
1.18	40		
0.6	35		
0.425	34		
0.3	29		
0.212	29		
0.15	27		
0.063	26		

Sample Proportions	% dry mass
Cobbles	0
Gravel	58
Sand	16
Silt and Clay	26

Grading Analysis	
Uniformity Coefficient	

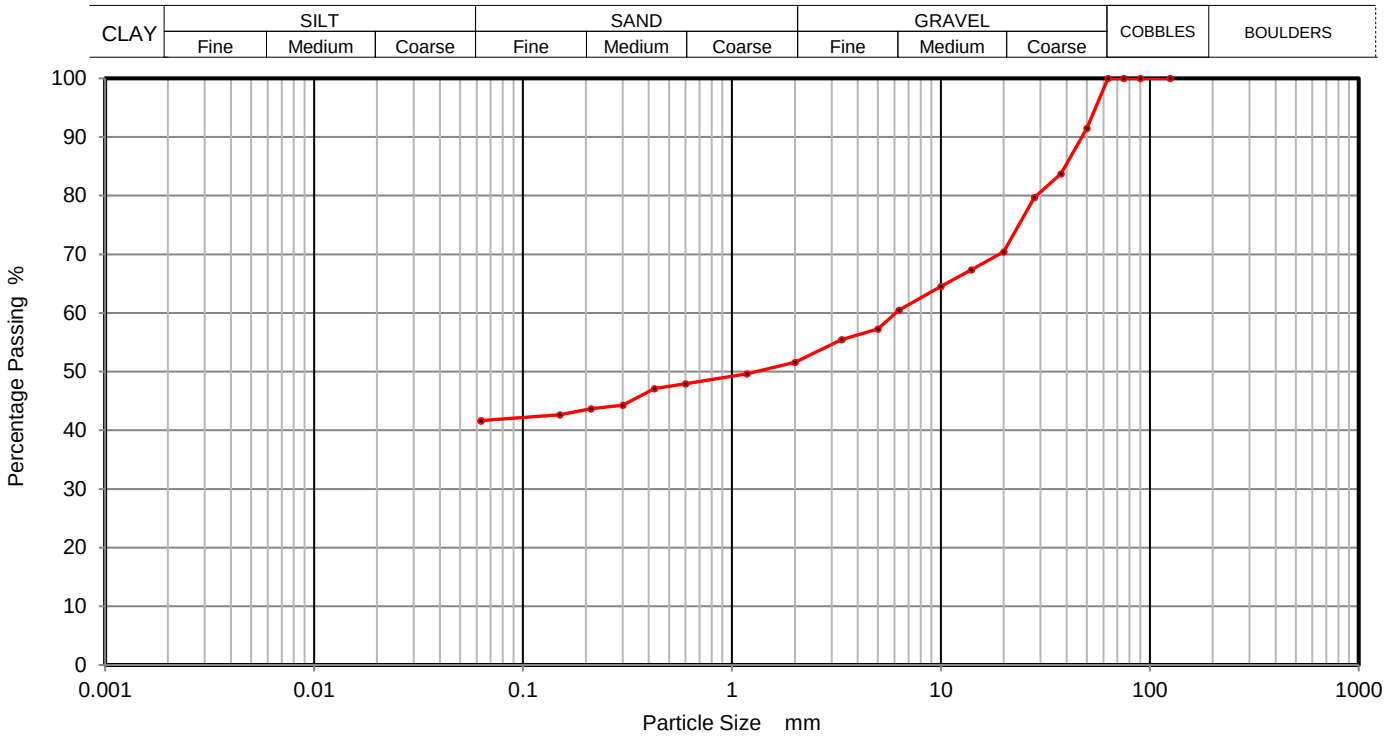
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17/06/2018	Wayne Honey	W. Honey
RO/MH	Approved	18/06/2018	Ben Sharp	

UKAS TESTING

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39446
		Borehole/Pit No.	WDL B3
Site Name	Riverside MV	Sample No.	
Soil Description	Brown fine to coarse sandy silty/ clayey fine to coarse GRAVEL	Depth Top	ST/P
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	92		
37.5	84		
28	80		
20	70		
14	67		
10	65		
6.3	60		
5	57		
3.35	55		
2	52		
1.18	50		
0.6	48		
0.425	47		
0.3	44		
0.212	44		
0.15	43		
0.063	42		

Sample Proportions	% dry mass
Cobbles	0
Gravel	48
Sand	10
Silt and Clay	42

Grading Analysis	
Uniformity Coefficient	

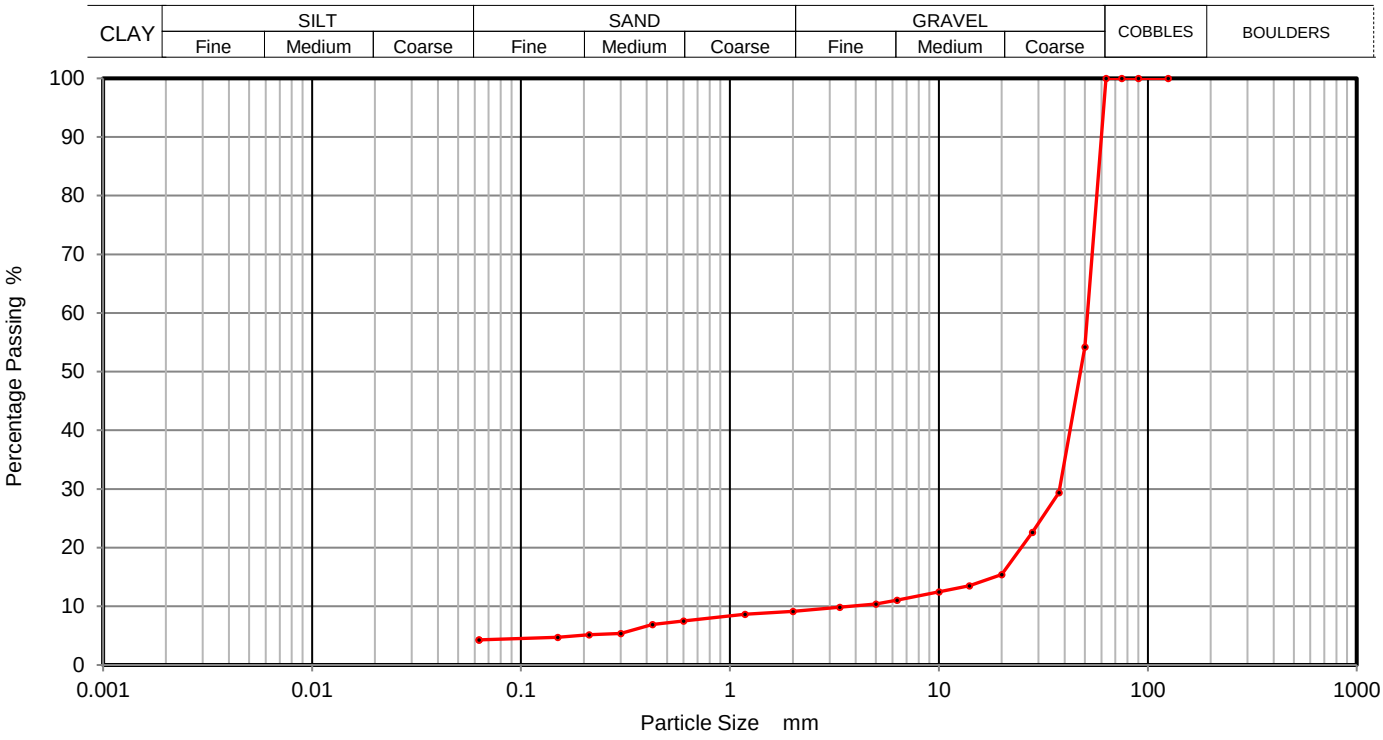
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17/06/2018	Wayne Honey	W. Honey
RO/MH	Approved	18/06/2018	Ben Sharp	

UKAS TESTING

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39446
		Borehole/Pit No.	WDL B4
Site Name	Riverside MV	Sample No.	
Soil Description	Brown slightly silty/ clayey slightly sandy fine to coarse GRAVEL	Depth Top	ST/P
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	54		
37.5	29		
28	23		
20	15		
14	13		
10	12		
6.3	11		
5	10		
3.35	10		
2	9		
1.18	9		
0.6	7		
0.425	7		
0.3	5		
0.212	5		
0.15	5		
0.063	4		

Sample Proportions	% dry mass
Cobbles	0
Gravel	91
Sand	5
Silt and Clay	4

Grading Analysis	
Uniformity Coefficient	

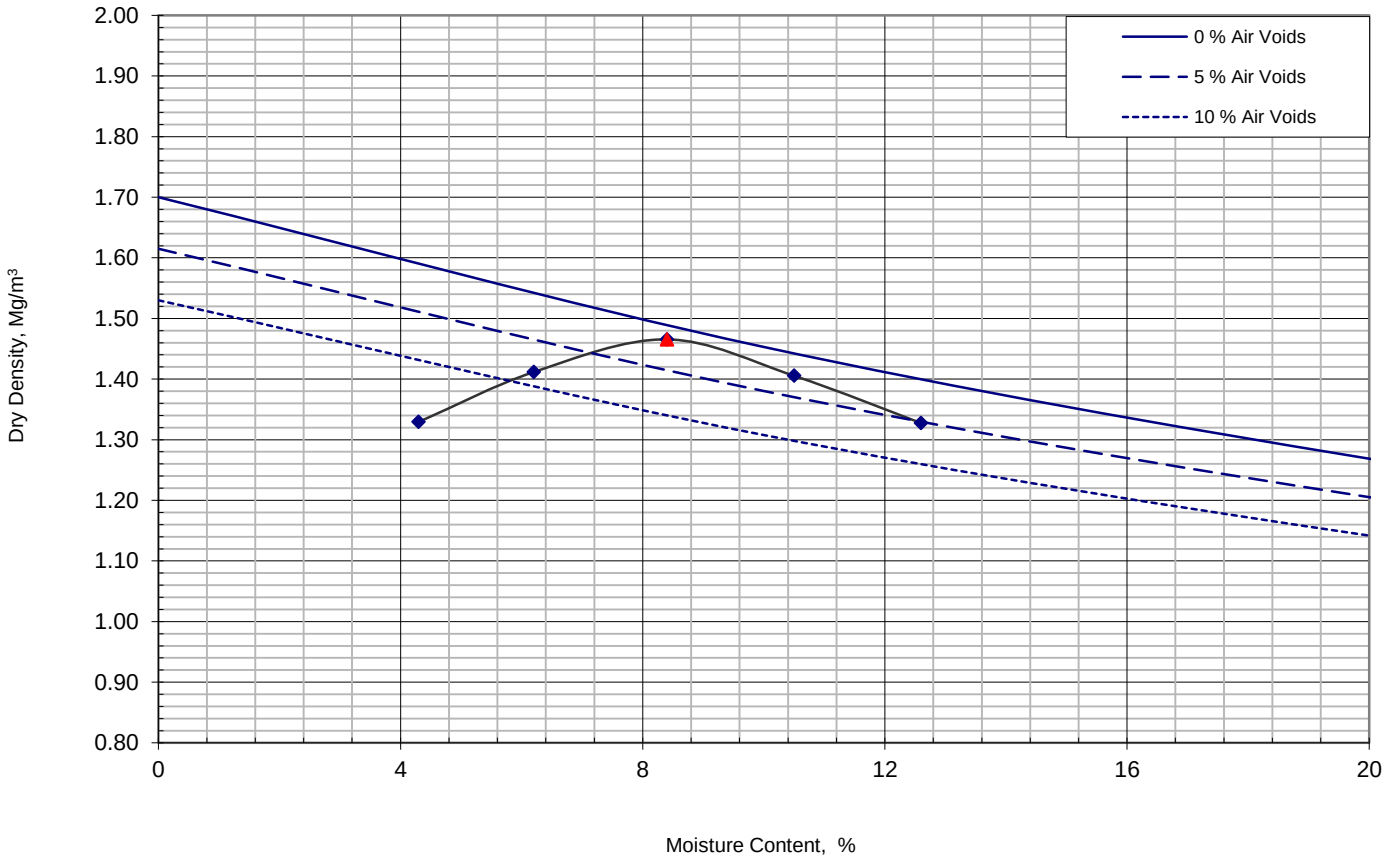
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17/06/2018	Wayne Honey	W. Honey
RO/MH	Approved	18/06/2018	Ben Sharp	

UKAS TESTING

GSTL	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number	39446
		Borehole / Pit No	WDL
Site Name	Riverside MV	Sample No	B1
Soil Description	Light brown fine to coarse gravelly SILT	Depth Top	
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B

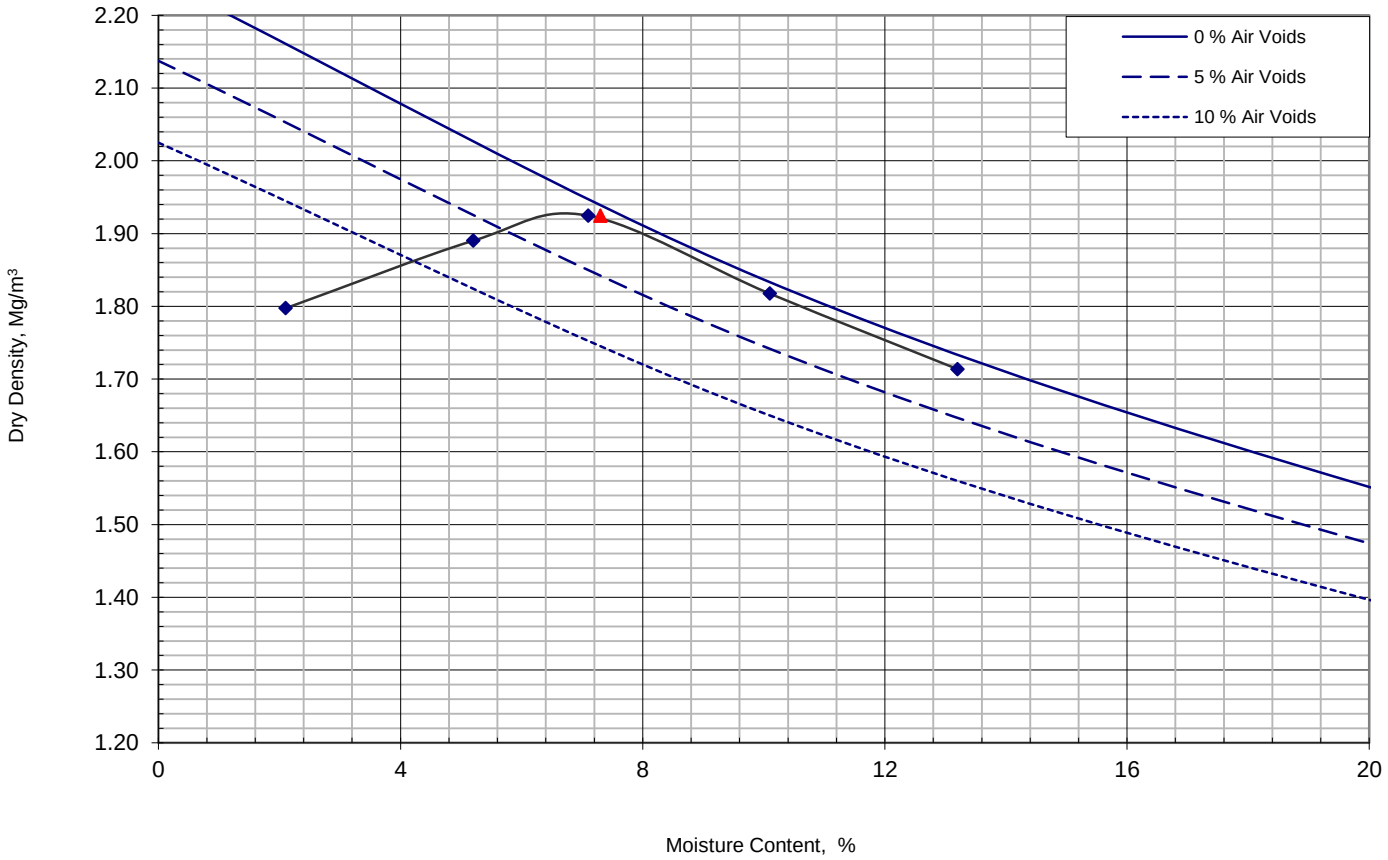


Compaction Point	1	2	3	4	5							
Moisture Content	4.3	6.2	8.4	11	13							
Bulk Density	1.39	1.50	1.59	1.55	1.49							
Dry Density	1.33	1.41	1.47	1.41	1.33							

Initial Moisture Content	4.3	%
Maximum Dry Density	1.47	Mg/m3
Optimum Moisture Content	8	%
Particle Density	1.7 Assumed	Mg/m3
Material Retained 37.5mm		%
Material Retained 20mm	14.23	%

Operators	Checked	11/06/2018	Richard John	
CA	Approved	12/06/2018	Ben Sharp	

GSTL	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number	39446
		Borehole / Pit No	WDL
Site Name	Riverside MV	Sample No	B2
Soil Description	Brown silty fine to coarse GRAVEL	Depth Top	
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B

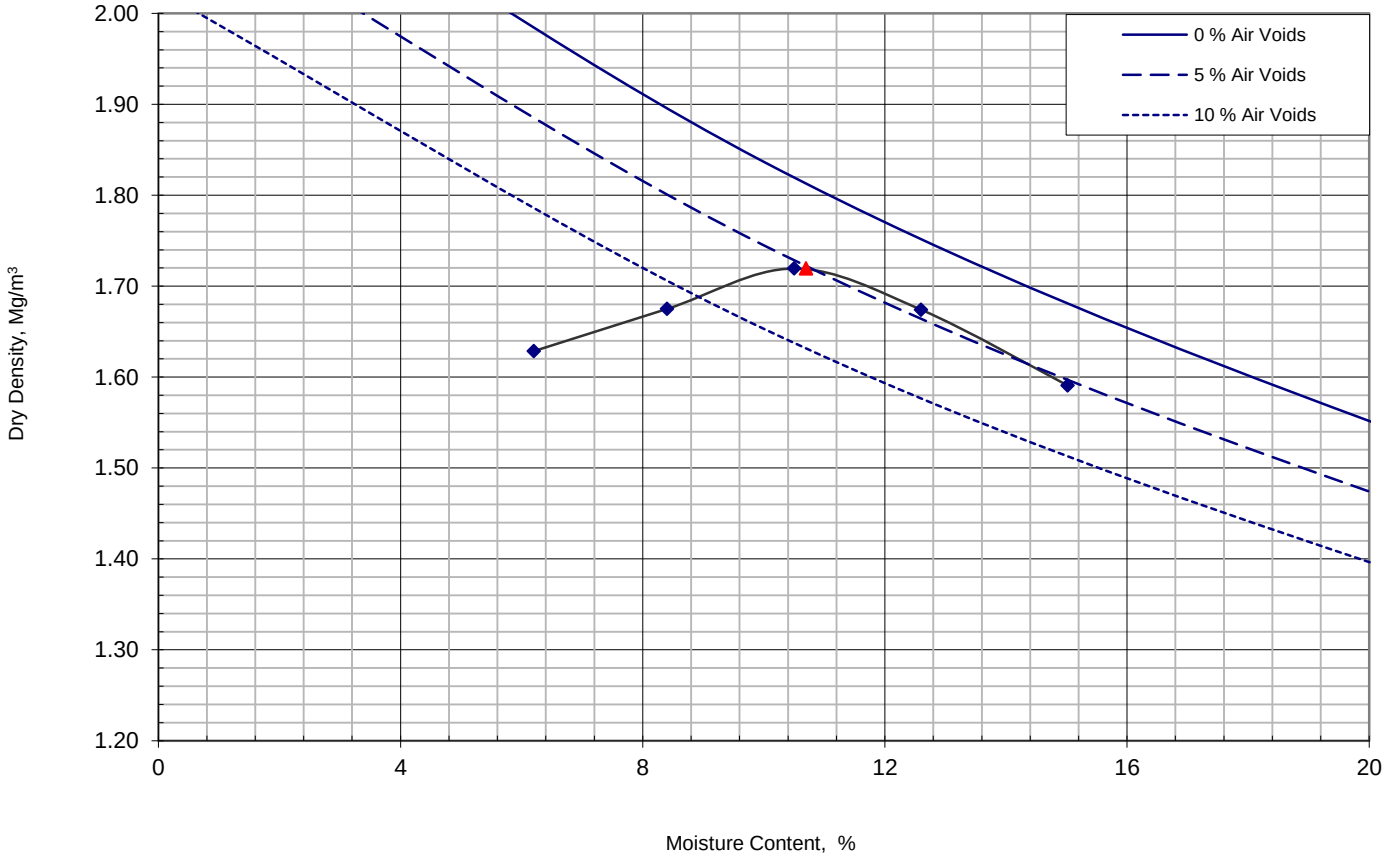


Compaction Point	1	2	3	4	5							
Moisture Content	2.1	5.2	7.1	10	13							
Bulk Density	1.84	1.99	2.06	2.00	1.94							
Dry Density	1.80	1.89	1.92	1.82	1.71							

Initial Moisture Content	7.1	%
Maximum Dry Density	1.92	Mg/m3
Optimum Moisture Content	7	%
Particle Density	2.25 Assumed	Mg/m3
Material Retained 37.5mm	31.11	%
Material Retained 20mm	14.21	%

Operators	Checked	11/06/2018	Richard John	
CA	Approved	12/06/2018	Ben Sharp	

GSTL	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number	39446
		Borehole / Pit No	WDL
Site Name	Riverside MV	Sample No	B3
Soil Description	Brown fine to coarse gravelly SILT	Depth Top	
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B

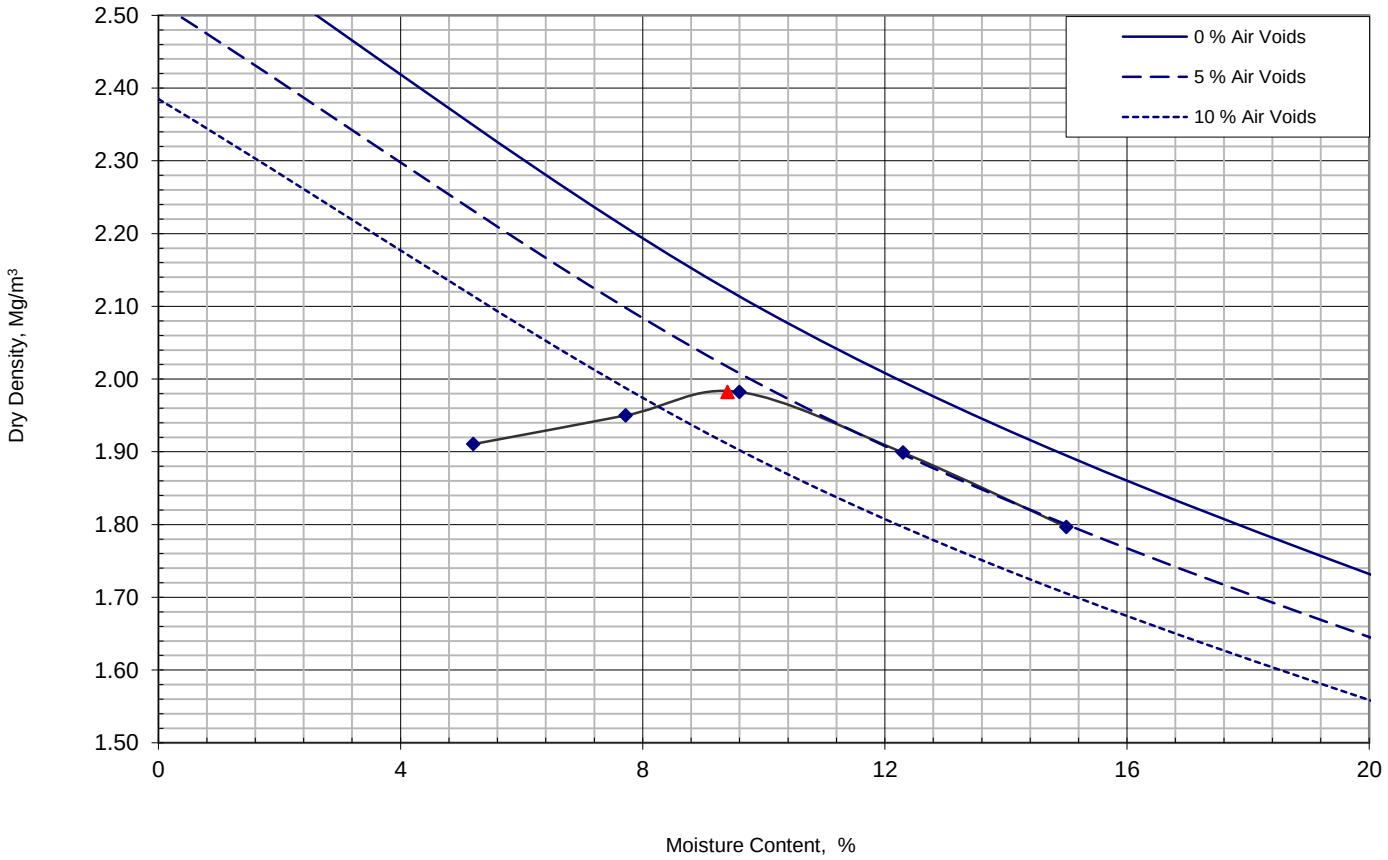


Compaction Point	1	2	3	4	5							
Moisture Content	6.2	8.4	11	13	15							
Bulk Density	1.73	1.82	1.90	1.88	1.83							
Dry Density	1.63	1.67	1.72	1.67	1.59							

Initial Moisture Content	15	%
Maximum Dry Density	1.72	Mg/m3
Optimum Moisture Content	11	%
Particle Density	2.25 Assumed	Mg/m3
Material Retained 37.5mm		%
Material Retained 20mm	10.24	%

Operators	Checked	11/06/2018	Richard John	
CA	Approved	12/06/2018	Ben Sharp	

GSTL	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number	39446
		Borehole / Pit No	WDL
Site Name	Riverside MV	Sample No	B4
Soil Description	Brown clayey silty fine to coarse GRAVEL	Depth Top	
Compaction Method	2.5 Kg Rammer	Depth Base	
Compaction Clause	BS1377:Part 4:1990, Clause 3.4	Sample Type	B



Compaction Point	1	2	3	4	5							
Moisture Content	5.2	7.7	9.6	12	15							
Bulk Density	2.01	2.10	2.17	2.13	2.07							
Dry Density	1.91	1.95	1.98	1.90	1.80							

Initial Moisture Content	7.7	%
Maximum Dry Density	1.98	Mg/m3
Optimum Moisture Content	9	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	33.97	%
Material Retained 20mm	32.93	%

Operators	Checked	11/06/2018	Richard John	
CA	Approved	12/06/2018	Ben Sharp	

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B5	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very clayey very sandy GRAVEL with medium cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	13 June 2018	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	13 June 2018	**Date Tested:**	15 June 2018

Test Results

Moisture Content (%)	11

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
BS1377-2 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	20/06/2018	**MC**
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

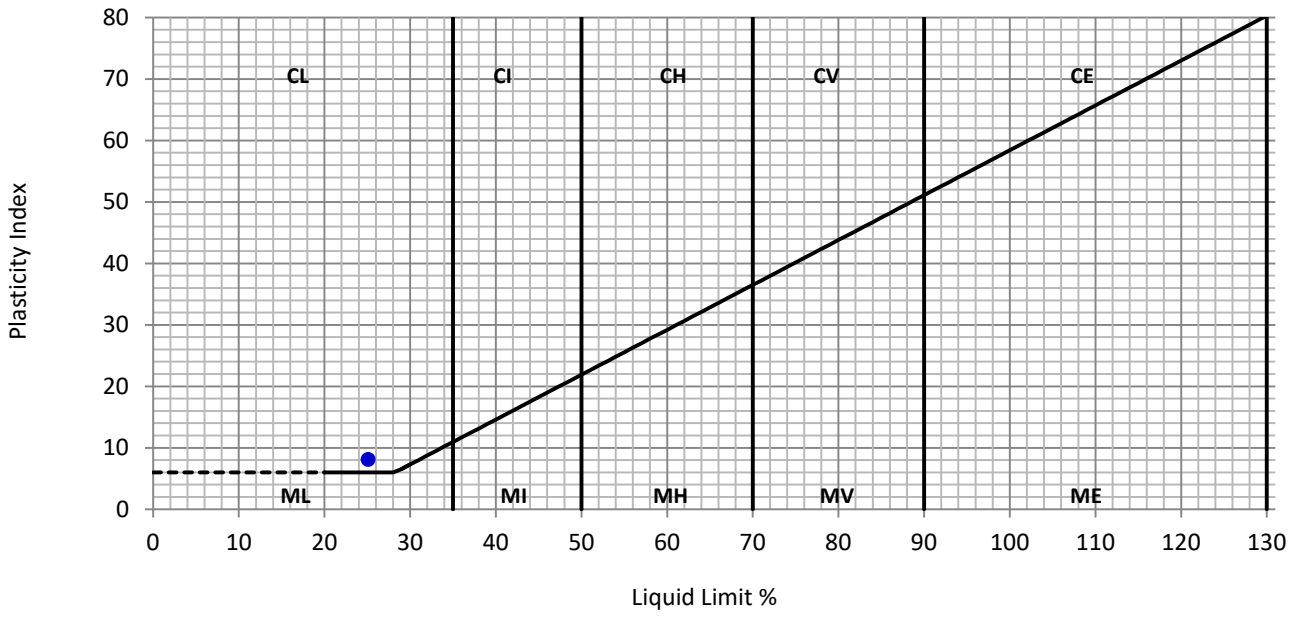
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B5	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very clayey very sandy GRAVEL with medium cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	13 June 2018	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	13 June 2018	**Date Tested:**	18 June 2018

Test Results

Liquid Limit	25	%
Plastic Limit	17	%
Plasticity Index	8	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	30	%



Remarks:

QA Ref.	**Apex Testing Solutions**	Approver	Date	Fig.
BS1377-2 Rev 3.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096 7771	D Simon	20/06/2018	**ATT**
		D Simon, Laboratory Manager		

TEST REPORT

PARTICLE SIZE DISTRIBUTION ANALYSIS

BS 1377:Part 2:1990: Clause 9.2 / 9.4

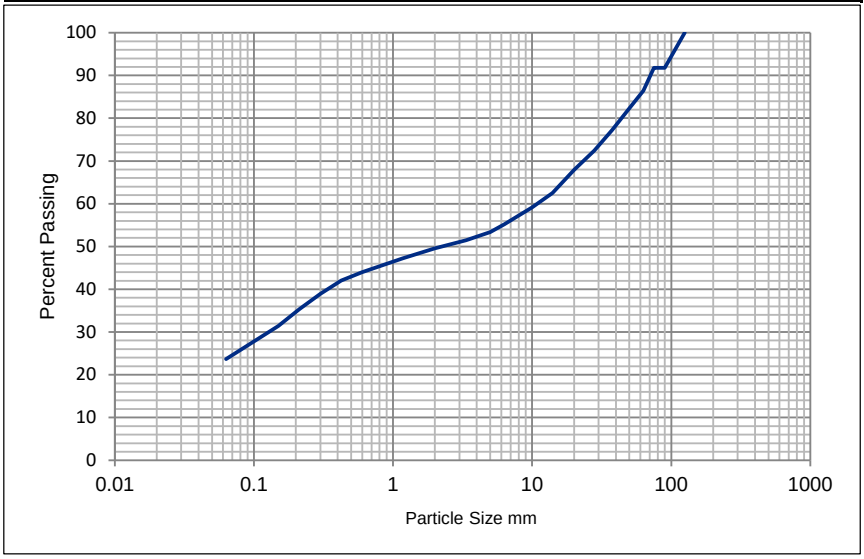
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B5	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very clayey very sandy GRAVEL with medium cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	13 June 2018	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	13 June 2018	**Date Tested:**	

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	92
75	92
63	86
50	82
37.5	77
28	72
20	68
14	63
10	59
6.3	55
5.0	53
3.35	51
2.00	50
1.18	47
0.600	44
0.425	42
0.300	39
0.212	35
0.150	31
0.063	24

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	14	N/A	D_{60} / D_{10}
Gravel	37		
Sand	26	**Dry mass of sample, kg**	
Silt / Clay	24	34.8	N/A

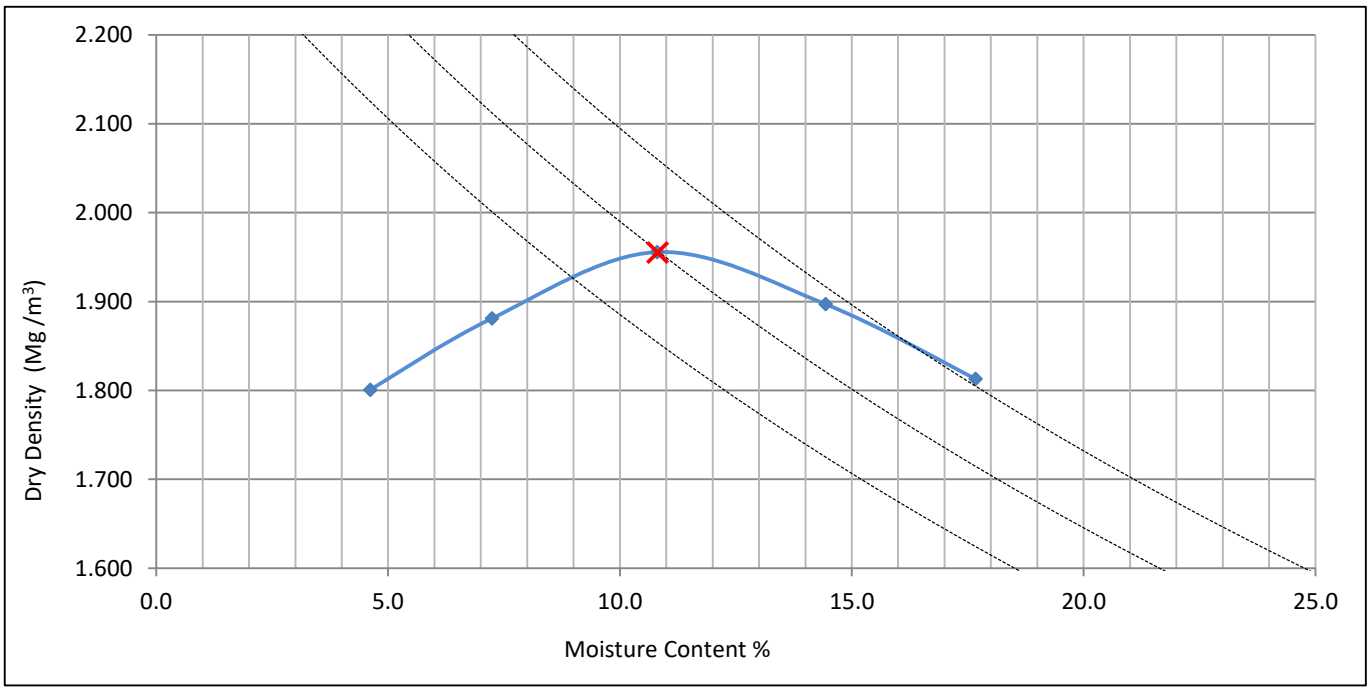
Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

QA Ref.				
BS1377 - 2 Rev 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	Approver: D Simon D Simon, Laboratory Manager	Date: 20/06/2018	Fig: **PSD**

TEST REPORT
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990: Clause

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B5	**Depth (m):**	
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very clayey very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:		**Material Supplier:**	N/A
Sampled By:	Client	**Specification:**	BS1377
Date Received:	24 April 2018	**Date Tested:**	25 April 2018



Test Method:	BS 1377: part 4: 1990: clause 3.4, 2.5kg rammer in a CBR mould
Preparation:	Original sample was natural, single specimen tested

Particle Density, Mg/m^3	2.62	assumed
Material > 37.5mm	1.40	%
Material < 37.5mm > 20mm	7.66	%

Derived Parameters ×	
Maximum Dry Density, Mg/m^3	1.96
Optimum Moisture Content %	11

Remarks:

.

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377 - 4	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ	7771	D Simon	18/06/2018	**COMP**
Rev. 2.0	Tel: 01656 746762 Fax: 01656 749096		D Simon, Laboratory Manager		

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B6	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very silty very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	13 June 2018	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	13 June 2018	**Date Tested:**	15 June 2018

Test Results

Moisture Content (%)	10

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
BS1377-2 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	20/06/2018	**MC**
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

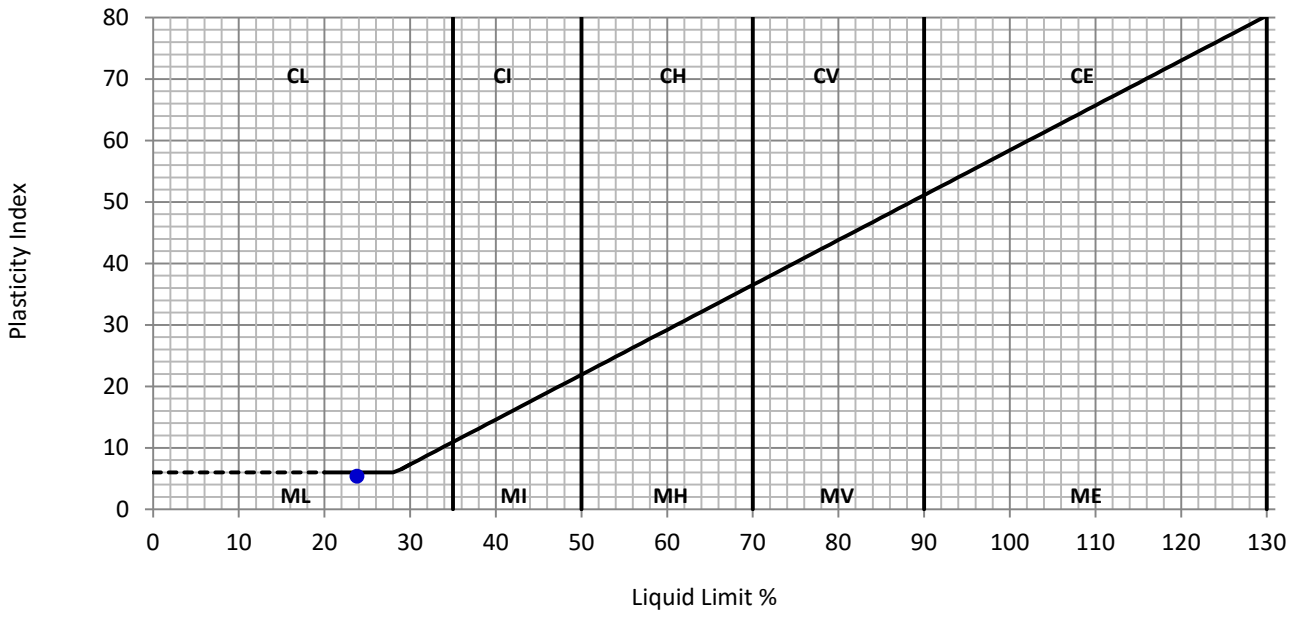
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B6	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very silty very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	13 June 2018	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	13 June 2018	**Date Tested:**	18 June 2018

Test Results

Liquid Limit	24	%
Plastic Limit	18	%
Plasticity Index	5	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	24	%



Remarks:

QA Ref.	**Apex Testing Solutions**	Approver	Date	Fig.
BS1377-2	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ	D Simon	20/06/2018	**ATT**
Rev 3.0	Tel: 01656 746762 Fax: 01656 749096 7771	D Simon, Laboratory Manager		

TEST REPORT

PARTICLE SIZE DISTRIBUTION ANALYSIS

BS 1377:Part 2:1990: Clause 9.2 / 9.4

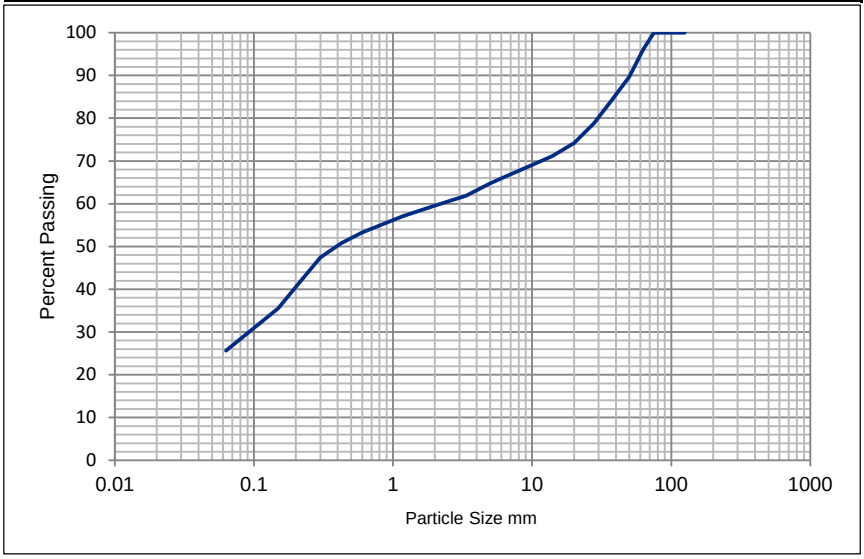
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B6	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very silty very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	13 June 2018	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	13 June 2018	**Date Tested:**	

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	96
50	90
37.5	84
28	79
20	74
14	71
10	69
6.3	66
5.0	65
3.35	62
2.00	60
1.18	57
0.600	53
0.425	51
0.300	47
0.212	42
0.150	36
0.063	26

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	4	N/A	D_{60} / D_{10}
Gravel	37		
Sand	34	**Dry mass of sample, kg**	
Silt / Clay	26	22.0	N/A

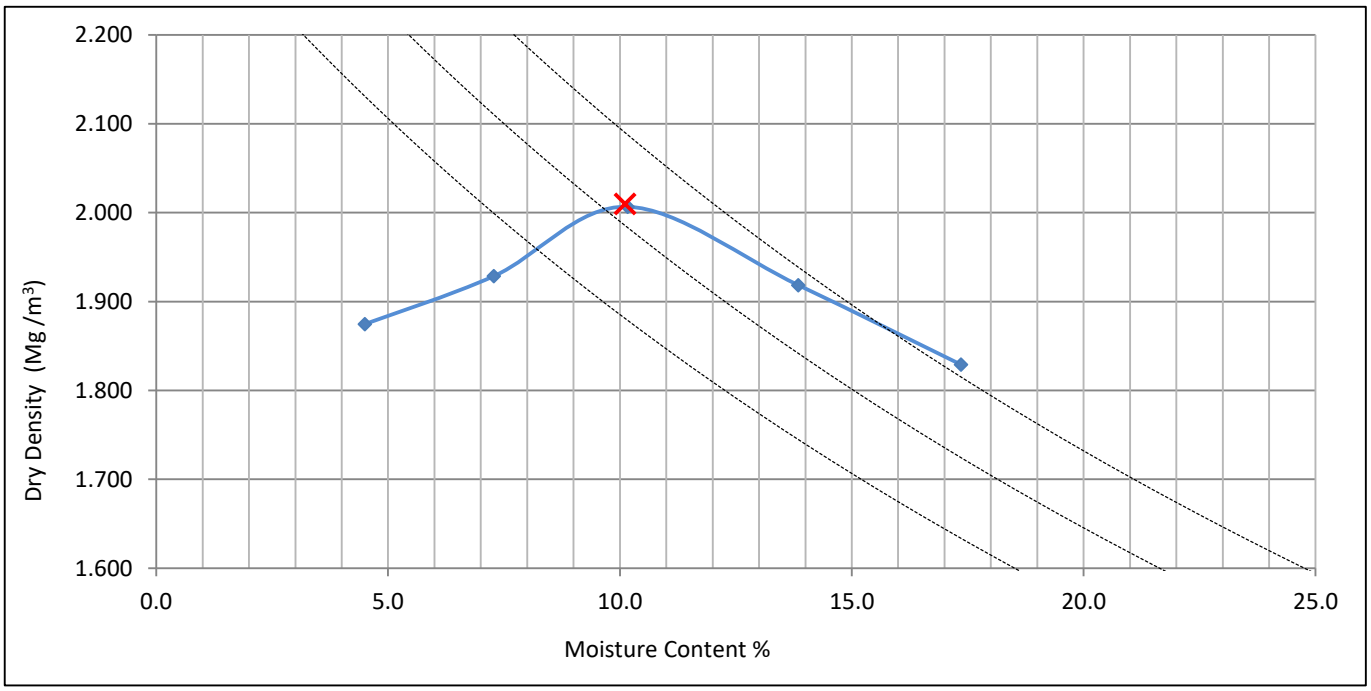
Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

QA Ref.				
BS1377 - 2 Rev 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	Approver: D Simon D Simon, Laboratory Manager	Date: 20/06/2018	Fig: **PSD**

TEST REPORT
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990: Clause

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B6	**Depth (m):**	
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	0
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:		**Material Supplier:**	N/A
Sampled By:	Client	**Specification:**	BS1377
Date Received:	24 April 2018	**Date Tested:**	25 April 2018



Test Method:	BS 1377: part 4: 1990: clause 3.4, 2.5kg rammer in a CBR mould
Preparation:	Original sample was natural, single specimen tested

Particle Density, Mg/m^3	2.62	assumed
Material > 37.5mm	2.83	%
Material < 37.5mm > 20mm	9.50	%

Derived Parameters ×	
Maximum Dry Density, Mg/m^3	2.01
Optimum Moisture Content %	10

Remarks:

.

Apex Testing Solutions
Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ
Tel: 01656 746762 Fax: 01656 749096
7771

Approver: D Simon — D Simon, Laboratory Manager
Date: 18/06/2018
Fig. COMP

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B7	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very clayey very gravelly SAND with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	13 June 2018	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	13 June 2018	**Date Tested:**	15 June 2018

Test Results

Moisture Content (%)	9

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
BS1377-2 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	20/06/2018	**MC**
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

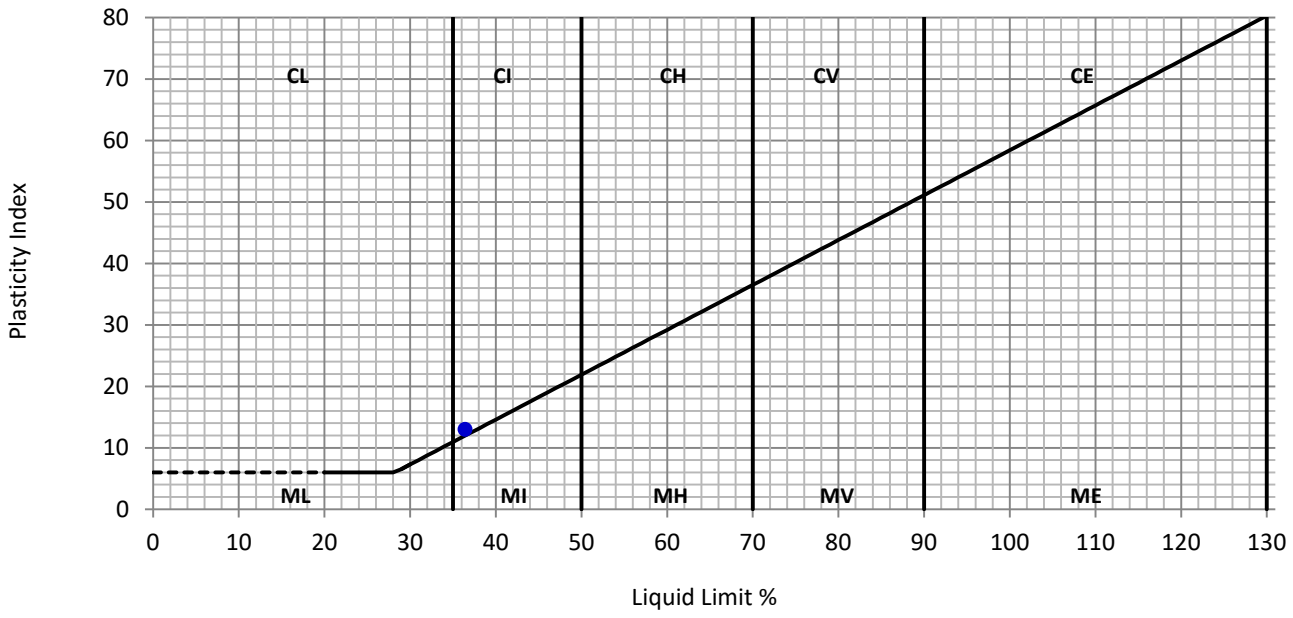
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B7	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very clayey very gravelly SAND with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	13 June 2018	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	13 June 2018	**Date Tested:**	18 June 2018

Test Results

Liquid Limit	36	%
Plastic Limit	24	%
Plasticity Index	13	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	23	%



Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377-2	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ		D Simon	20/06/2018	**ATT**
Rev 3.0	Tel: 01656 746762 Fax: 01656 749096	7771	D Simon, Laboratory Manager		

TEST REPORT

PARTICLE SIZE DISTRIBUTION ANALYSIS

BS 1377:Part 2:1990: Clause 9.2 / 9.4

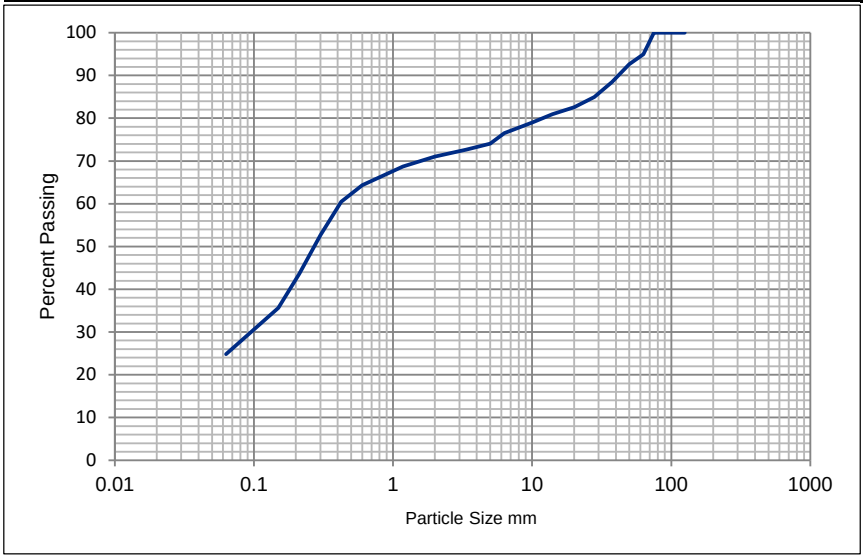
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B7	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very clayey very gravelly SAND with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	13 June 2018	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	13 June 2018	**Date Tested:**	

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	95
50	93
37.5	89
28	85
20	83
14	81
10	79
6.3	77
5.0	74
3.35	73
2.00	71
1.18	69
0.600	64
0.425	60
0.300	53
0.212	44
0.150	36
0.063	25

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	5	N/A	D_{60} / D_{10}
Gravel	24		
Sand	46	**Dry mass of sample, kg**	
Silt / Clay	25	17.1	N/A

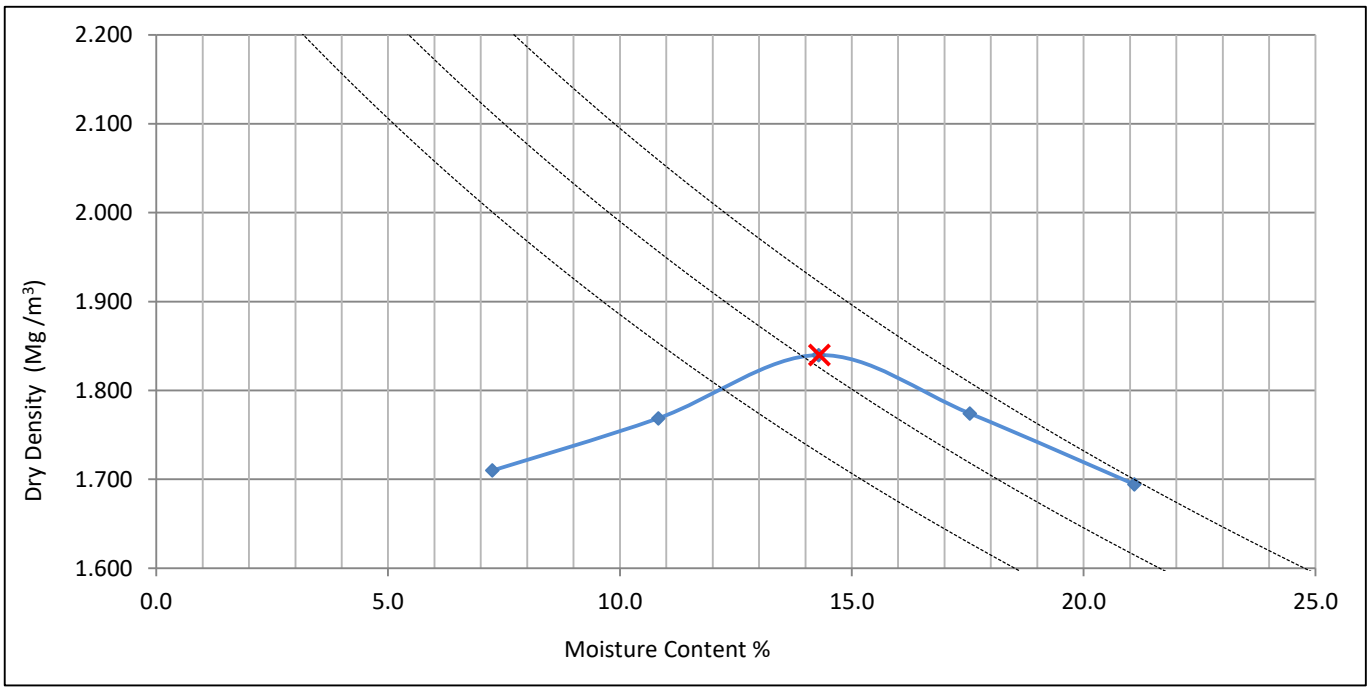
Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

QA Ref.	**Apex Testing Solutions**	Approver	Date	Fig
BS1377 - 2	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ	D Simon	20/06/2018	**PSD**
Rev 3.0	Tel: 01656 746762 Fax: 01656 749096 7771	D Simon, Laboratory Manager		

TEST REPORT
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990: Clause

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B7	**Depth (m):**	
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown very clayey very gravelly SAND with low cobble content.
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:		**Material Supplier:**	N/A
Sampled By:	Client	**Specification:**	BS1377
Date Received:	24 April 2018	**Date Tested:**	25 April 2018



Test Method:	BS 1377: part 4: 1990: clause 3.4, 2.5kg rammer in a CBR mould
Preparation:	Original sample was natural, single specimen tested

Particle Density, Mg/m^3	2.62	assumed
Material > 37.5mm	1.26	%
Material < 37.5mm > 20mm	7.41	%

Derived Parameters ×	
Maximum Dry Density, Mg/m^3	1.84
Optimum Moisture Content %	14

Remarks:

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QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377 - 4	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ	7771	D Simon	18/06/2018	**COMP**
Rev. 2.0	Tel: 01656 746762 Fax: 01656 749096		D Simon, Laboratory Manager		

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B8 Zone A1	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown slightly clayey very sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	21 June 2018	**Date Tested:**	22 June 2018

Test Results

Moisture Content (%)	7

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
BS1377-2 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	26/06/2018	**MC**
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

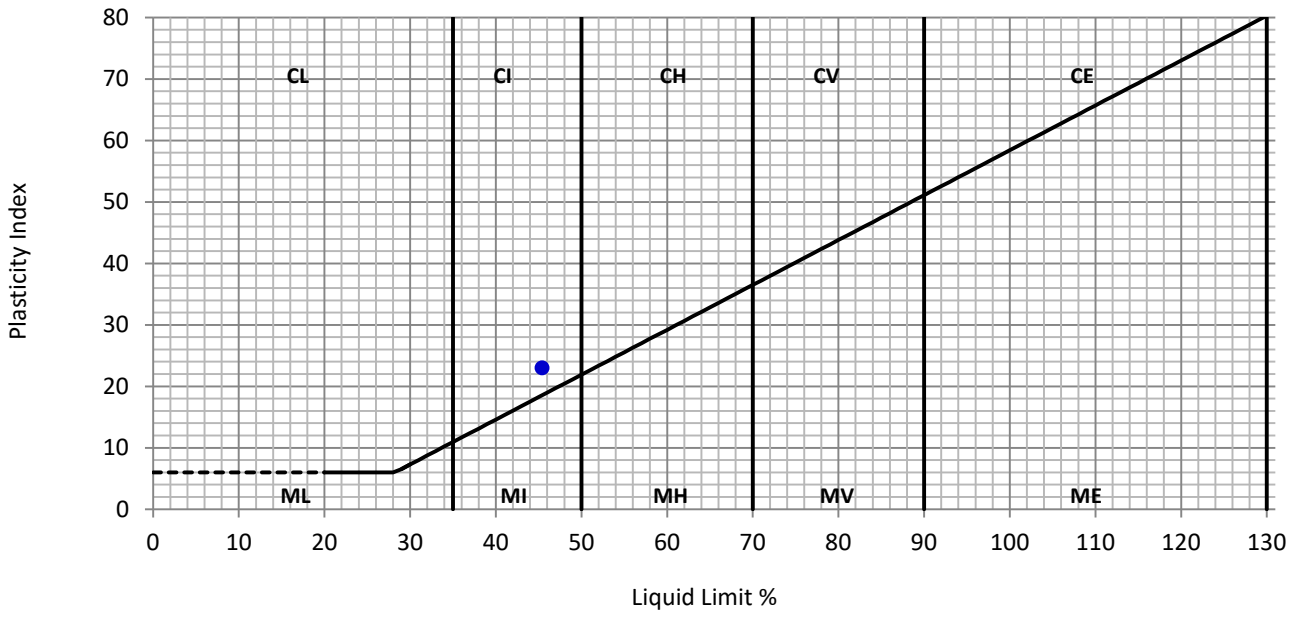
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B8 Zone A1	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown slightly clayey very sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	21 June 2018	**Date Tested:**	26 June 2018

Test Results

Liquid Limit	45	%
Plastic Limit	22	%
Plasticity Index	23	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	67	%



Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377-2	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ		D Simon	26/06/2018	**ATT**
Rev 3.0	Tel: 01656 746762 Fax: 01656 749096	7771	D Simon, Laboratory Manager		

TEST REPORT

PARTICLE SIZE DISTRIBUTION ANALYSIS

BS 1377:Part 2:1990: Clause 9.2 / 9.4

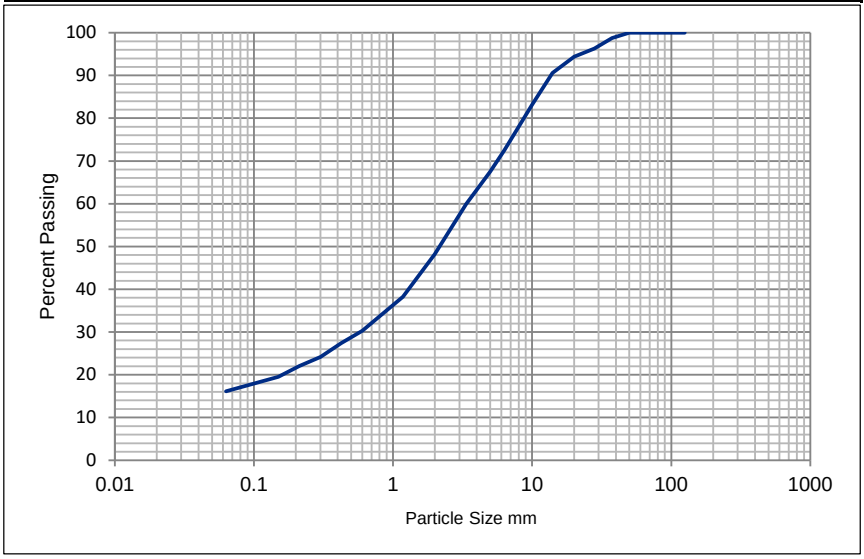
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B8 Zone A1	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown slightly clayey very sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	21 June 2018	**Date Tested:**	

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	99
28	96
20	94
14	91
10	83
6.3	72
5.0	68
3.35	60
2.00	48
1.18	38
0.600	30
0.425	27
0.300	24
0.212	22
0.150	20
0.063	16

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	0	N/A	D_{60} / D_{10}
Gravel	52		
Sand	32	**Dry mass of sample, kg**	
Silt / Clay	16	12.0	N/A

Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

QA Ref.			Approver	Date	Fig
BS1377 - 2 Rev 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	25/06/2018	**PSD**
			D Simon, Laboratory Manager		

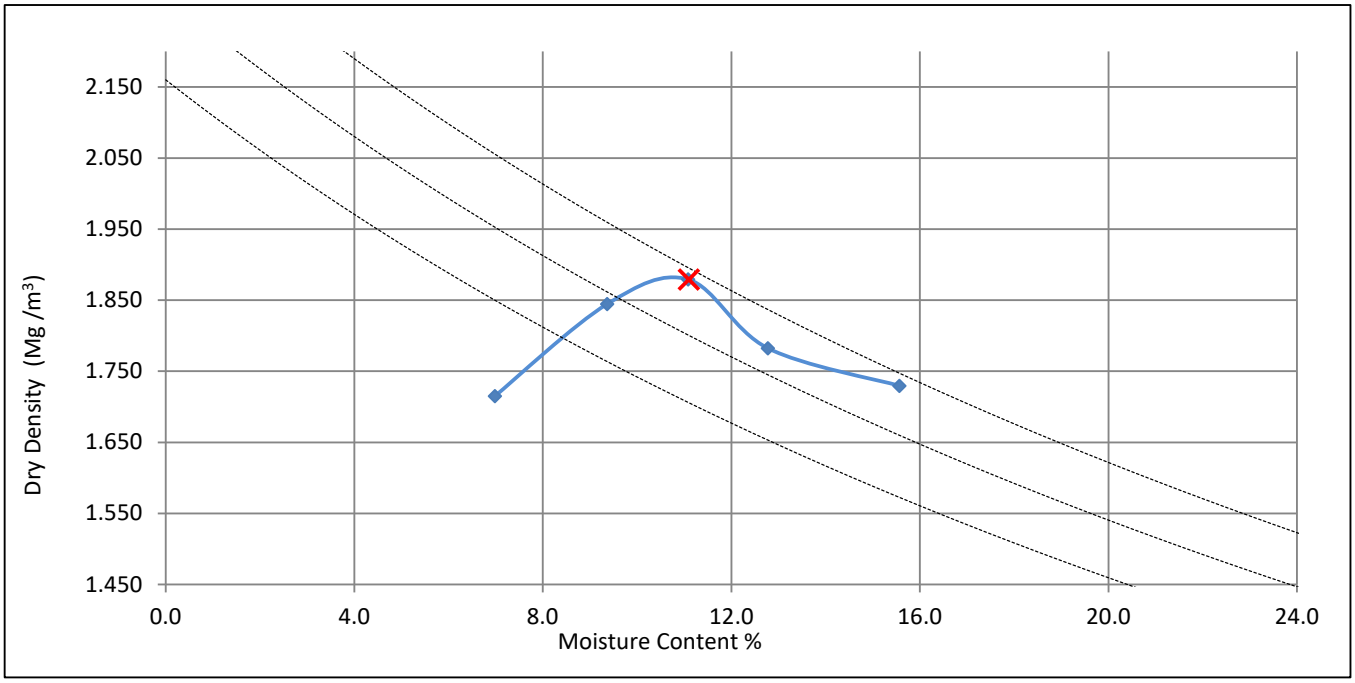
TEST REPORT

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS1377:Part 4:1990: Clause 3.4

Project No:	D8176-18	**Client:**	Intregral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B8 Zone A1	**Depth (m):**	N/A
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	N/A	**Material Description:**	
Location in Works:	N/A	**Material Source:**	N/A
Date Sampled:	05 June 2018	**Material Supplier:**	Site
Sampled By:	N/A	**Specification:**	BS1377
Date Received:	08 August 2017	**Date Tested:**	22 June 2018



Test Method:	BS 1377: part 4: 1990: clause 3.3, 2.5kg rammer in a 1 litre mould
Preparation:	Original sample was natural, single specimen tested

Particle Density, Mg/m^3	2.40	assumed
Material > 37.5mm	0	%
Material < 37.5mm > 20mm	3	%

Derived Parameters ×	
Maximum Dry Density, Mg/m^3	1.88
Optimum Moisture Content %	11.1

Remarks: 'X' Sample tested at clients request. Gravel retained between 20 - 37.5mm was returned to the sample to make up 30%

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377 - 4	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ	7771	D Simon	26/06/2018	COMP
Rev. 2.0	Tel: 01656 746762 Fax: 01656 749096		D Simon, Laboratory Manager		

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B9	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown slightly clayey very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	N/A	**Date Tested:**	22 June 2018

Test Results

Moisture Content (%)	6

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
BS1377-2 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	26/06/2018	**MC**
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

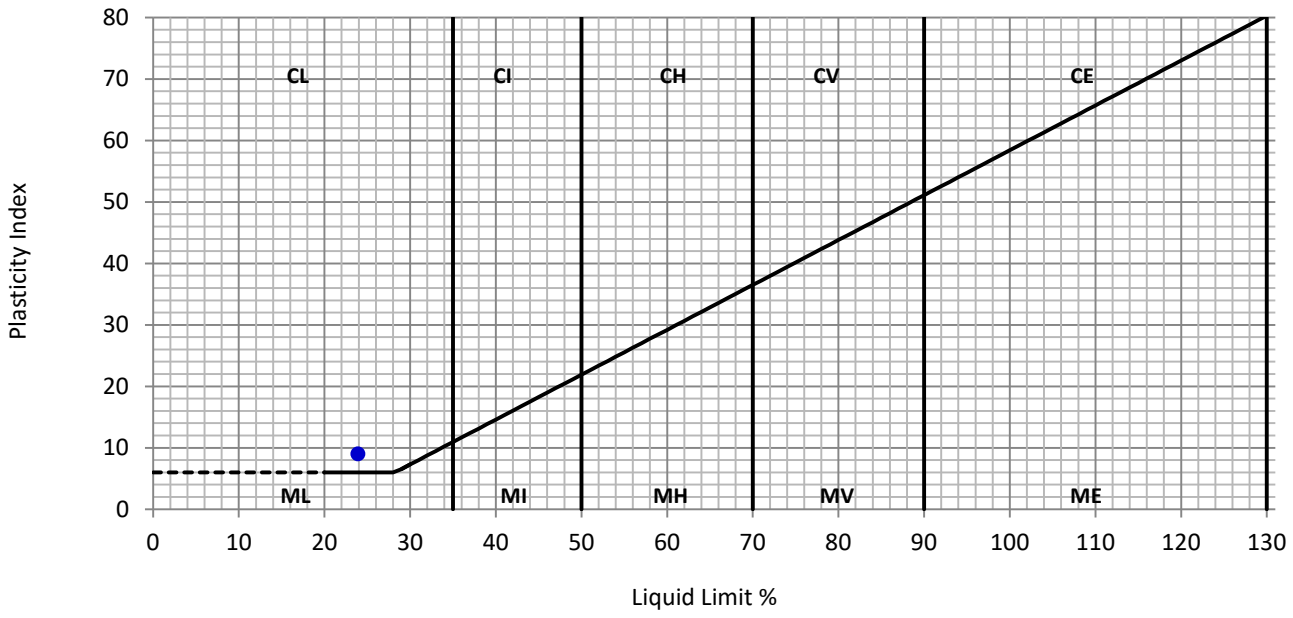
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B9	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown slightly clayey very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	N/A	**Date Tested:**	26 June 2018

Test Results

Liquid Limit	24	%
Plastic Limit	15	%
Plasticity Index	9	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	40	%



Remarks:

QA Ref.	**Apex Testing Solutions**	Approver	Date	Fig.
BS1377-2 Rev 3.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	D Simon	26/06/2018	**ATT**
	7771	D Simon, Laboratory Manager		

TEST REPORT

PARTICLE SIZE DISTRIBUTION ANALYSIS

BS 1377:Part 2:1990: Clause 9.2 / 9.4

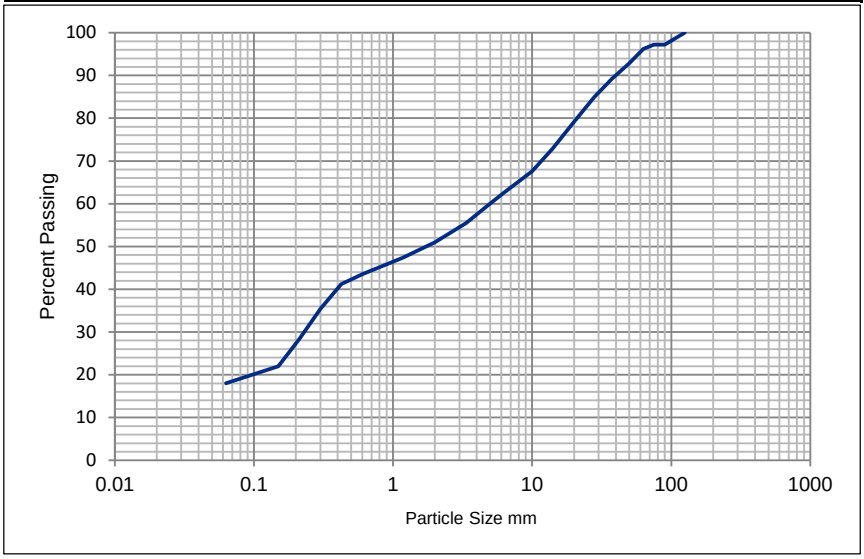
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B9	**Depth (m):**	N/A - N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown slightly clayey very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	N/A	**Date Tested:**	

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	97
75	97
63	96
50	93
37.5	89
28	85
20	79
14	73
10	68
6.3	63
5.0	60
3.35	55
2.00	51
1.18	47
0.600	44
0.425	41
0.300	35
0.212	28
0.150	22
0.063	18

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	4	N/A	D_{60} / D_{10}
Gravel	45		
Sand	33	**Dry mass of sample, kg**	
Silt / Clay	18	28.1	N/A

Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

QA Ref.			Approver	Date	Fig
BS1377 - 2 Rev 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	25/06/2018	**PSD**
			D Simon, Laboratory Manager		

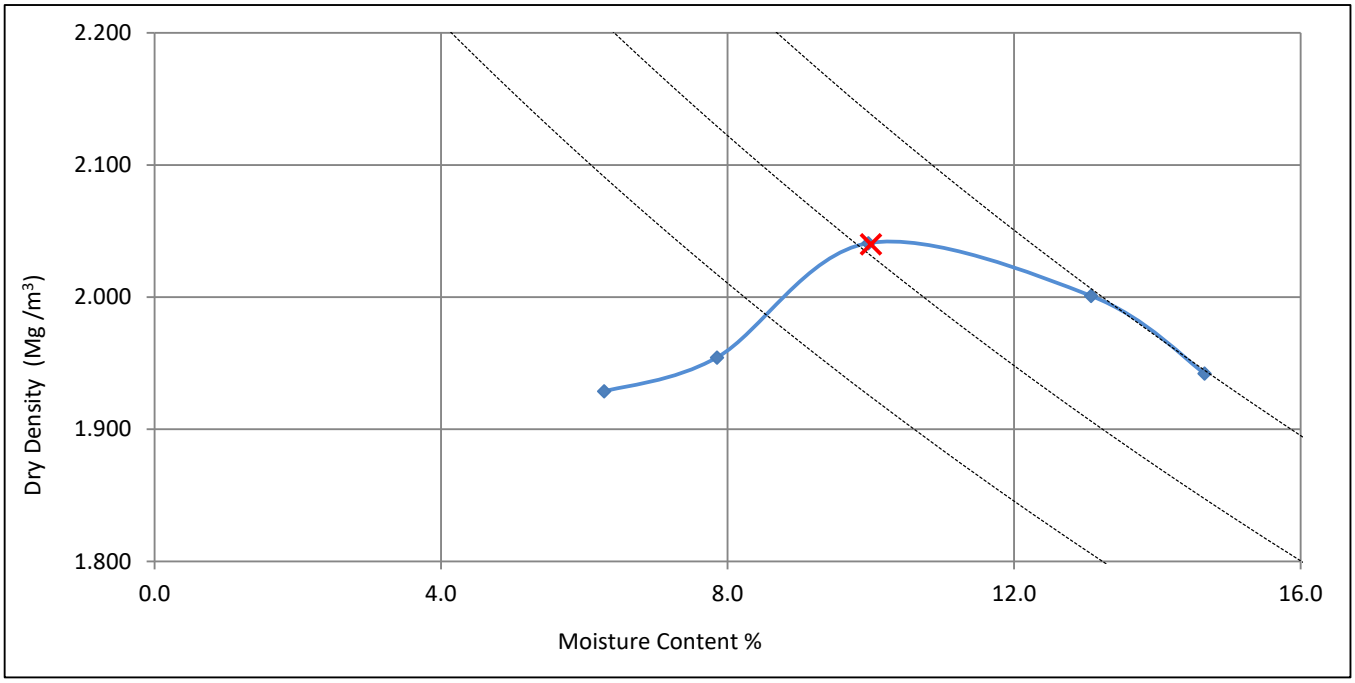
TEST REPORT

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS1377:Part 4:1990: Clause 3.4

Project No:	D8176-18	**Client:**	Intregral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B9	**Depth (m):**	N/A
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	N/A	**Material Description:**	
Location in Works:	N/A	**Material Source:**	N/A
Date Sampled:	05 June 2018	**Material Supplier:**	Site
Sampled By:	N/A	**Specification:**	BS1377
Date Received:	08 August 2017	**Date Tested:**	22 June 2018



Test Method:	BS 1377: part 4: 1990: clause 3.3, 2.5kg rammer in a 1 litre mould
Preparation:	Original sample was natural, single specimen tested

Particle Density, Mg/m^3	2.72	assumed
Material > 37.5mm	0	%
Material < 37.5mm > 20mm	5	%

Derived Parameters ×	
Maximum Dry Density, Mg/m^3	2.04
Optimum Moisture Content %	10.0

Remarks: 'X' Sample tested at clients request. Gravel retained between 20 - 37.5mm was returned to the sample to make up 30%

QA Ref.	Apex Testing Solutions		Approver	Date	Fig.
BS1377 - 4 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon D Simon, Laboratory Manager	26/06/2018	COMP

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Email:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B10	**Depth (m):**	N/A
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown slightly silty very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	Client	**Specification:**	BS 1377
Date Received:	28 June 2018	**Date Tested:**	05 July 2018

Test Results

Moisture Content (%)	7

Remarks:

QA Ref.	Apex Testing Solutions		Approver	Date	Fig
BS1377-2 Rev. 2.0	Stormi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	12/07/2018	MC
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

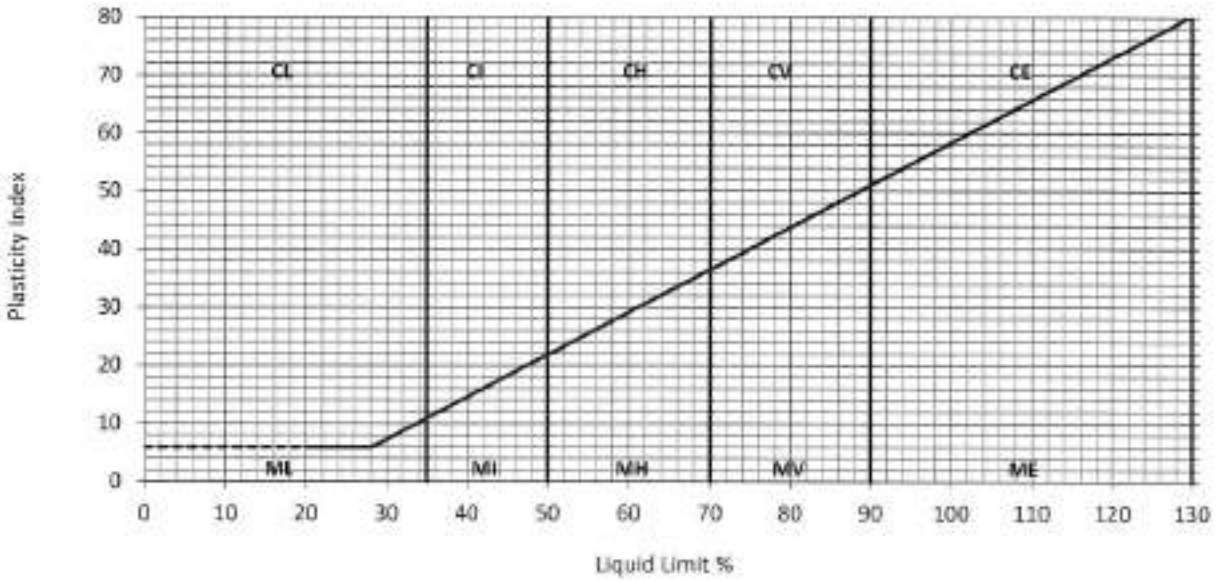
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Email:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B10	**Depth (m):**	N/A
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown slightly silty very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	Client	**Specification:**	BS 1377
Date Received:	28 June 2018	**Date Tested:**	12 July 2018

Test Results

Liquid Limit	%
Plastic Limit	%
Plasticity Index	%

Preparation:	4.2.3 Natural Specimen
Proportion retained on 425µm sieve:	%



Remarks: Sample is non-plastic.

QA Ref. BS1377-2 Rev 3.0	Apex Testing Solutions Stormi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 746696	7771	Approver: D Simon D Simon, Laboratory Manager	Date: 12/07/2018	Fig. ATT

TEST REPORT
PARTICLE SIZE DISTRIBUTION ANALYSIS
BS 1377:Part 2:1990: Clause 9.2 / 9.4

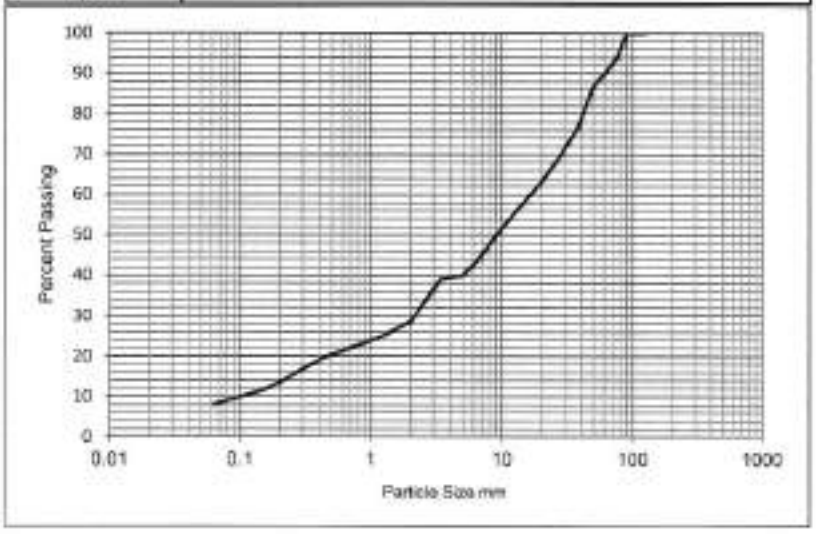
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Email:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B10	**Depth (m):**	N/A
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Brown slightly silty very sandy GRAVEL with low cobble content
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	Client	**Specification:**	BS 1377
Date Received:	28 June 2018	**Date Tested:**	16 July 2018

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	94
63	91
50	87
37.5	76
28	70
20	63
14	57
10	52
6.3	43
5.0	40
3.35	39
2.00	29
1.18	25
0.600	21
0.425	20
0.300	17
0.212	14
0.150	12
0.063	8

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	9	N/A	D_{60} / D_{10}
Gravel	62		
Sand	20	Dry mass of sample, kg	
Silt / Clay	8	27.7	N/A

Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

QA Ref.	Apex Testing Solutions	Approver	Date	Fig
BS1377 - 2 Rev 3.0	Sturm Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 748782 Fax: 01656 748096 7771	D Simon	16/07/2018	PSD
		D Simon, Laboratory Manager		

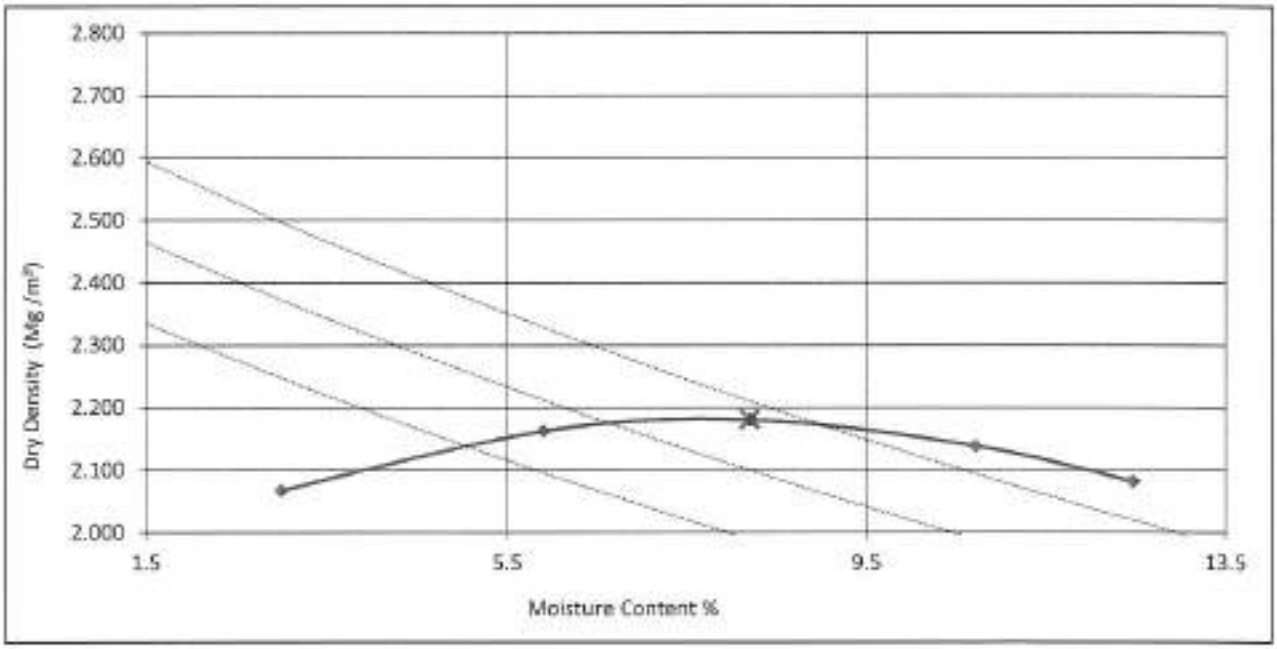
TEST REPORT

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS1377:Part 4:1990: Clause 3.4

Project No:	D8176-18	**Client:**	Integral
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	B10	**Depth (m):**	1.2
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	Yes	**Material Description:**	Brown slightly silty very sandy GRAVEL with low cobble content
Location in Works:	N/A	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	BS1377
Date Received:	29 June 2018	**Date Tested:**	02 July 2018



Test Method:	BS 1377: part 4: 1990: clause 3.4, 2.5kg rammer in a CBR mould
Preparation:	Original sample was natural, seperate specimens tested

Particle Density, Mg/m³	2.70	assumed
Material > 37.5mm	15	%
Material < 37.5mm > 20mm	21	%

Derived Parameters *	
Maximum Dry Density, Mg/m³	2.18
Optimum Moisture Content %	8.2

Remarks: 'X' Sample tested at clients request. Gravel retained between 20 - 37.5mm was returned to the sample to make up 30%

QA Ref. BS1377 - 4 Rev. 2.0	**Apex Testing Solutions** Stuart Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 740702 Fax: 01656 749006	7771	Approver: D Simon D Simon, Laboratory Manager	Date: 09/06/2018	Fig. COMP

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP9	**Depth (m):**	1.00 - 1.00
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey clayey very sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	N/A	**Date Tested:**	04 July 2018

Test Results

Moisture Content (%)	9

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
BS1377-2 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	04/07/2018	**MC**
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

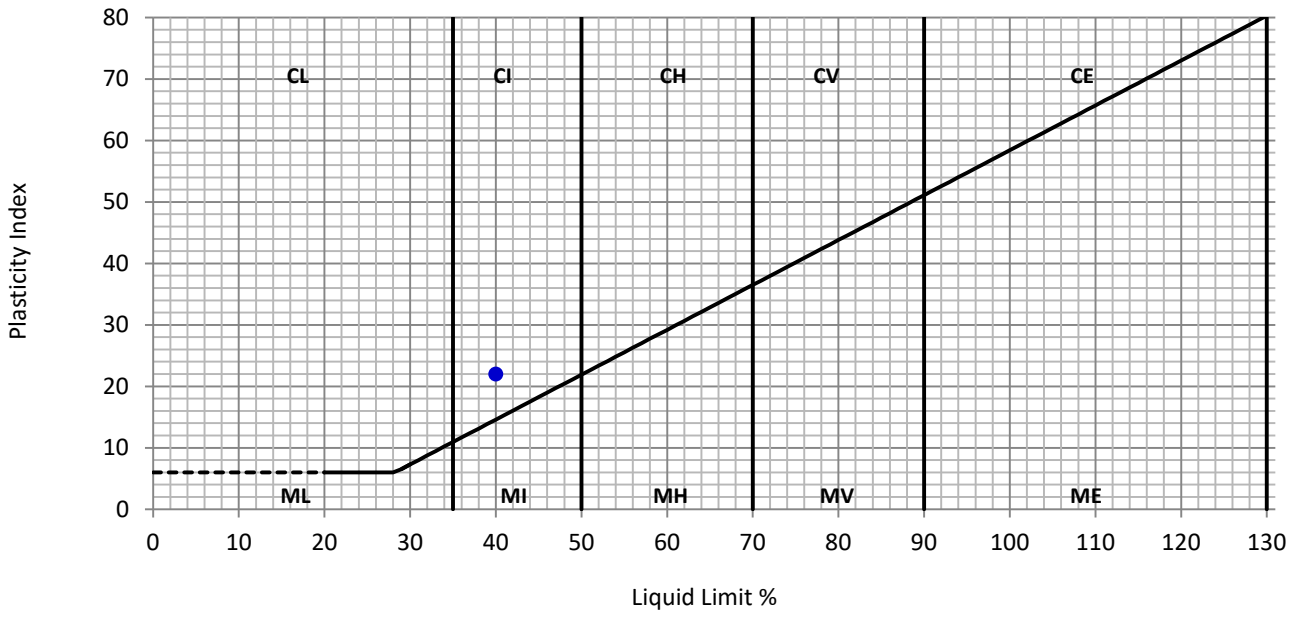
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP9	**Depth (m):**	1.00 - 1.00
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey clayey very sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	N/A	**Date Tested:**	04 July 2018

Test Results

Liquid Limit	40	%
Plastic Limit	18	%
Plasticity Index	22	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	66	%



Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377-2	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ		D Simon	04/07/2018	**ATT**
Rev 3.0	Tel: 01656 746762 Fax: 01656 749096	7771	D Simon, Laboratory Manager		

TEST REPORT

PARTICLE SIZE DISTRIBUTION ANALYSIS

BS 1377:Part 2:1990: Clause 9.2 / 9.4

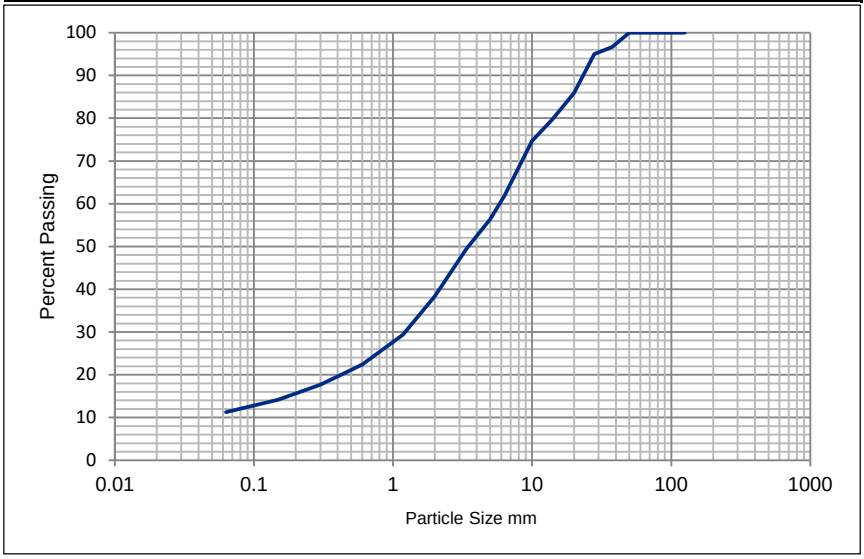
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP9	**Depth (m):**	1.00 - 1.00
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey clayey very sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	N/A	**Date Tested:**	

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	97
28	95
20	86
14	80
10	75
6.3	62
5.0	56
3.35	49
2.00	38
1.18	29
0.600	22
0.425	20
0.300	18
0.212	16
0.150	14
0.063	11

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	0	N/A	D_{60} / D_{10}
Gravel	62		
Sand	27	Dry mass of sample, kg	
Silt / Clay	11	12.7	N/A

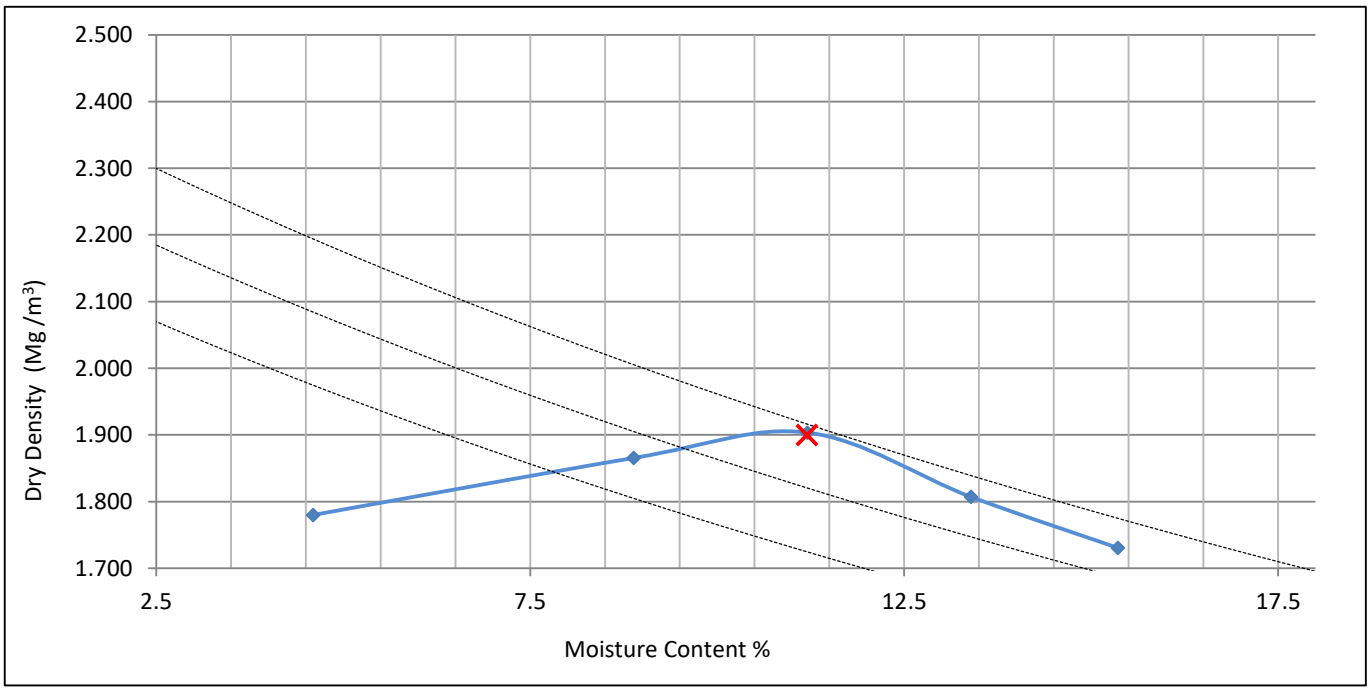
Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

QA Ref.			Approver	Date	Fig
BS1377 - 2 Rev 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	04/07/2018	**PSD**
			D Simon, Laboratory Manager		

TEST REPORT
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990: Clause

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP9	**Depth (m):**	N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey silty sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	Client	**Specification:**	BS1377
Date Received:	24 April 2018	**Date Tested:**	27 June 2018



Test Method:	BS 1377: part 4: 1990: clause 3.4, 2.5kg rammer in a CBR mould
Preparation:	Original sample was natural, single specimen tested

Particle Density, Mg/m^3	2.44	assumed
Material > 37.5mm	12.38	%
Material < 37.5mm > 20mm	17.93	%

Derived Parameters ×	
Maximum Dry Density, Mg/m^3	1.90
Optimum Moisture Content %	11

Remarks:

.

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377 - 4	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ	7771	D Simon	04/07/2018	**COMP**
Rev. 2.0	Tel: 01656 746762 Fax: 01656 749096		D Simon, Laboratory Manager		

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP17	**Depth (m):**	1.00 - 1.00
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Black slightly sandy slightly gravelly SILT
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	N/A	**Date Tested:**	28 June 2018

Test Results

Moisture Content (%)	28

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
BS1377-2 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	28/06/2018	**MC**
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

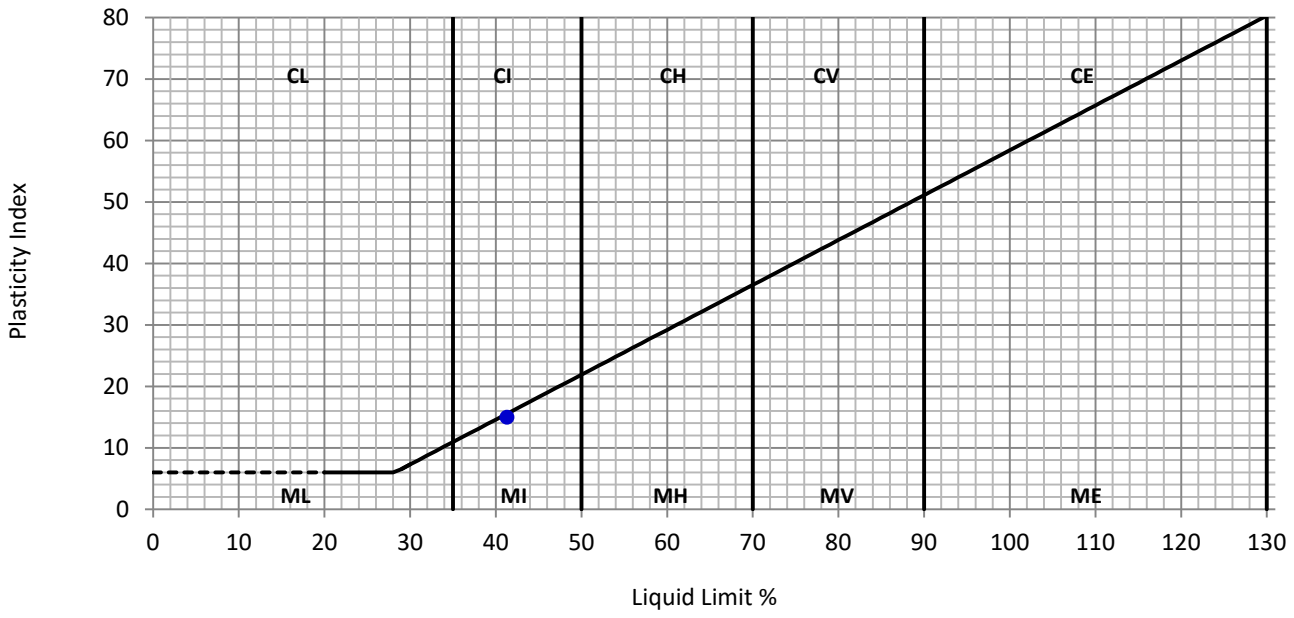
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP17	**Depth (m):**	1.00 - 1.00
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Black slightly sandy slightly gravelly SILT
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	N/A	**Date Tested:**	26 June 2018

Test Results

Liquid Limit	41	%
Plastic Limit	26	%
Plasticity Index	15	%

Preparation:	4.2.3 Natural Specimen	
Proportion retained on 425µm sieve:	0	%



Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377-2	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ		D Simon	28/06/2018	**ATT**
Rev 3.0	Tel: 01656 746762 Fax: 01656 749096	7771	D Simon, Laboratory Manager		

TEST REPORT

PARTICLE SIZE DISTRIBUTION ANALYSIS

BS 1377:Part 2:1990: Clause 9.2 / 9.4

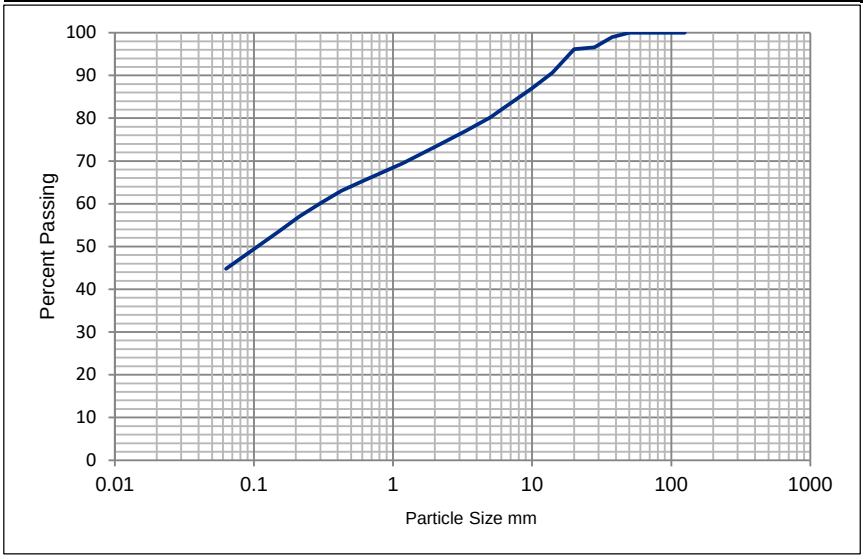
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP17	**Depth (m):**	1.00 - 1.00
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Black slightly sandy slightly gravelly SILT
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	
Date Received:	N/A	**Date Tested:**	

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	99
28	97
20	96
14	91
10	87
6.3	82
5.0	80
3.35	77
2.00	73
1.18	70
0.600	65
0.425	63
0.300	60
0.212	57
0.150	53
0.063	45

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	0	N/A	D_{60} / D_{10}
Gravel	27		
Sand	28	**Dry mass of sample, kg**	
Silt / Clay	45	8.5	N/A

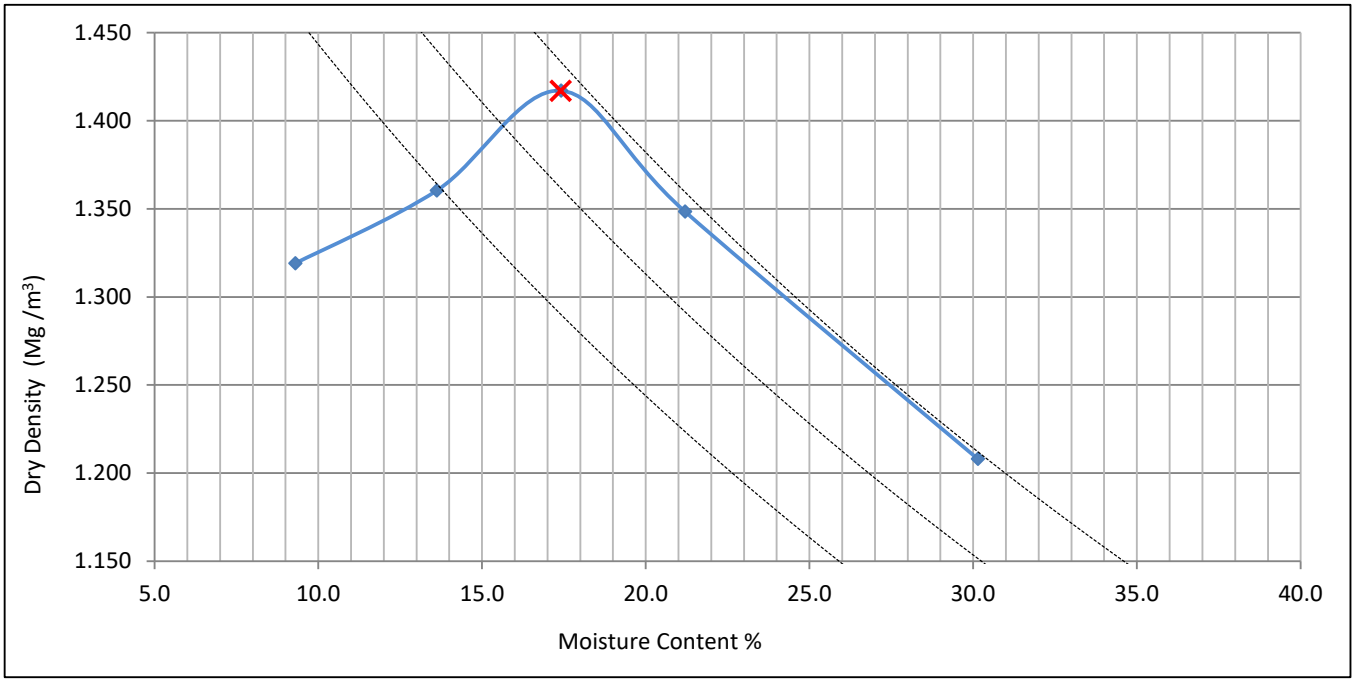
Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

QA Ref.					
BS1377 - 2 Rev 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	Approver D Simon D Simon, Laboratory Manager	Date 25/06/2018	Fig **PSD**

TEST REPORT
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990: Clause

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP17	**Depth (m):**	N/A
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Black slightly sandy slightly gravelly SILT
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	Client	**Specification:**	BS1377
Date Received:	24 April 2018	**Date Tested:**	27 June 2018



Test Method:	BS 1377: part 4: 1990: clause 3.3, 2.5kg rammer in a 1 litre mould
Preparation:	Original sample was natural, single specimen tested

Particle Density, Mg/m^3	1.91	assumed
Material > 37.5mm	0.00	%
Material < 37.5mm > 20mm	0.00	%

Derived Parameters ×	
Maximum Dry Density, Mg/m^3	1.42
Optimum Moisture Content %	17

Remarks:

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QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377 - 4	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ	7771	D Simon	28/06/2018	**COMP**
Rev. 2.0	Tel: 01656 746762 Fax: 01656 749096		D Simon, Laboratory Manager		

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Email:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP22	**Depth (m):**	0.75 - 0.75
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey clayey sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:		**Material Supplier:**	N/A
Sampled By:		**Specification:**	BS 1377
Date Received:	N/A	**Date Tested:**	05 July 2018

Test Results

Moisture Content (%)	45

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
BS1377-2 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D simon	05/07/2018	**MC**
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

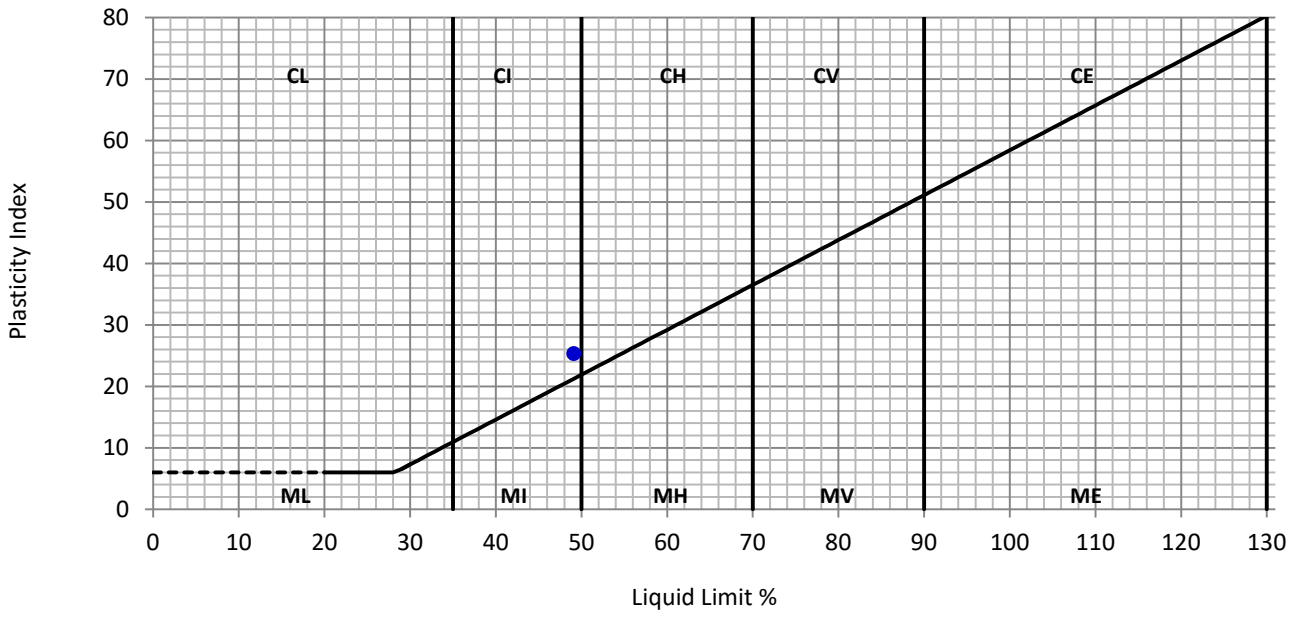
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Email:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP22	**Depth (m):**	0.75 - 0.75
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey clayey sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:		**Material Supplier:**	N/A
Sampled By:		**Specification:**	BS 1377
Date Received:	N/A	**Date Tested:**	06 July 2018

Test Results

Liquid Limit	49	%
Plastic Limit	24	%
Plasticity Index	25	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	66	%



Remarks:

QA Ref.	**Apex Testing Solutions**	Approver	Date	Fig.
BS1377-2 Rev 3.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	D Simon	06/07/2018	**ATT**
	7771	D Simon, Laboratory Manager		

TEST REPORT

PARTICLE SIZE DISTRIBUTION ANALYSIS

BS 1377:Part 2:1990: Clause 9.2 / 9.4

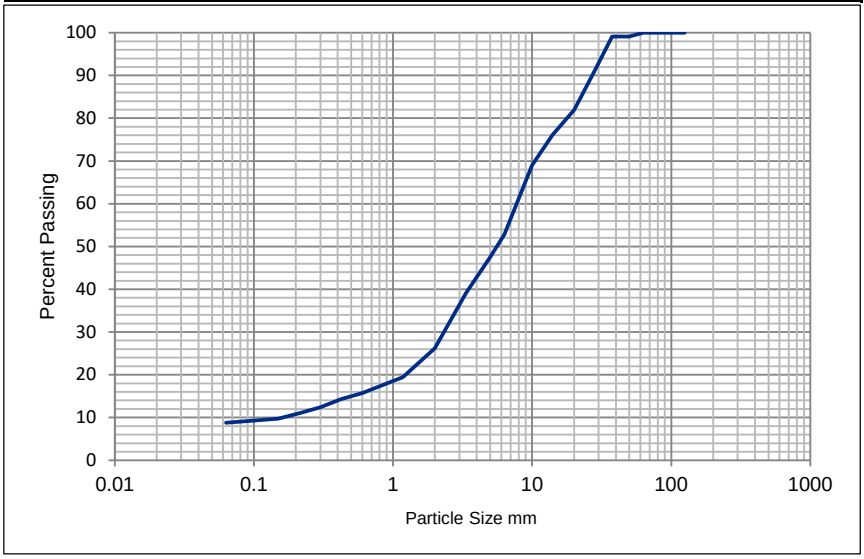
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Email:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP22	**Depth (m):**	0.75 - 0.75
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey clayey sandy GRAVEL
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:		**Material Supplier:**	N/A
Sampled By:		**Specification:**	BS 1377
Date Received:	N/A	**Date Tested:**	

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
50	99
37.5	99
28	91
20	82
14	76
10	69
6.3	53
5.0	47
3.35	39
2.00	26
1.18	19
0.600	16
0.425	14
0.300	12
0.212	11
0.150	10
0.063	9

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	0	N/A	D_{60} / D_{10}
Gravel	74		
Sand	17	**Dry mass of sample, kg**	
Silt / Clay	9	11.3	N/A

Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

QA Ref.				
BS1377 - 2 Rev 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	Approver: D Simon D Simon, Laboratory Manager	Date: 05/07/2018	Fig: **PSD**

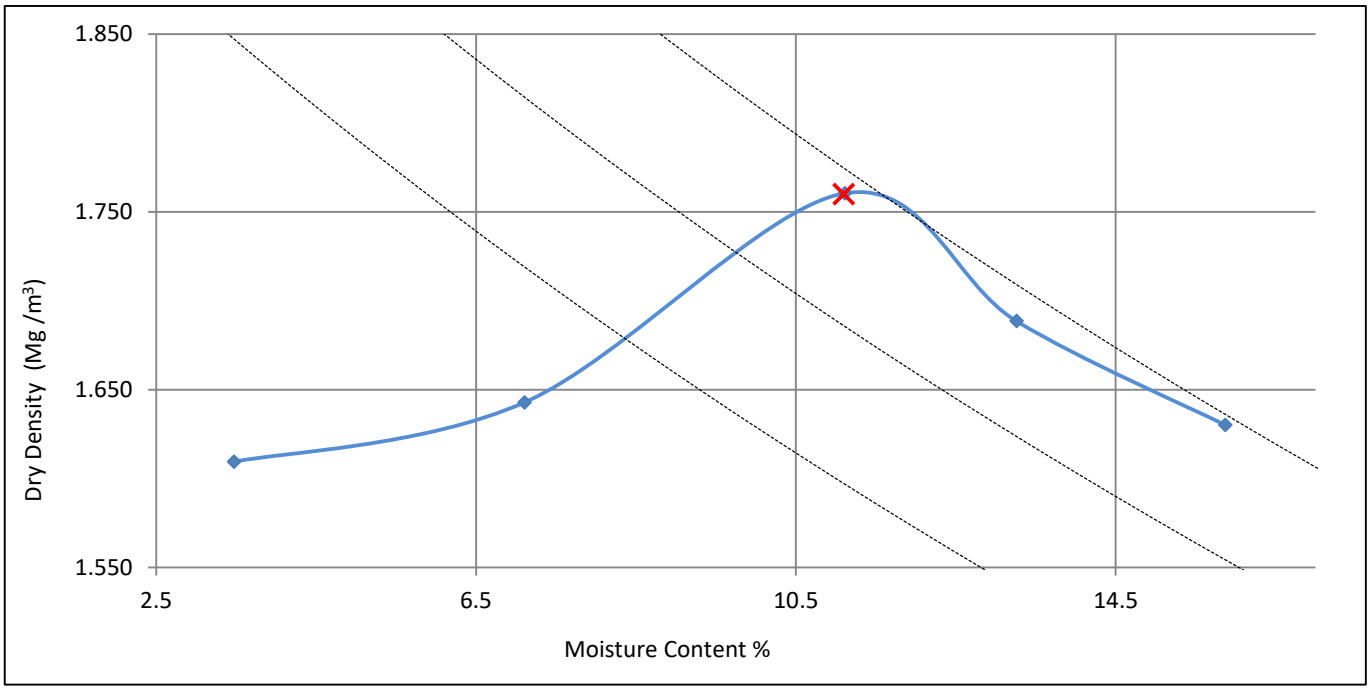
TEST REPORT

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS1377:Part 4:1990: Clause 3.4

Project No:	D8176-18	**Client:**	Integral
Project Name:	Riverside, Merthyr Vale	**Address:**	7 Beddau Way Castlegate Businedd Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP22	**Depth (m):**	0.75
Sample No:		**Sample Type:**	Bulk
Sampling Certificate Received:	Yes	**Material Description:**	Dark grey silty GRAVEL
Location in Works:	N/A	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	BS1377
Date Received:	29 June 2018	**Date Tested:**	02 July 2018



Test Method:	BS 1377: part 4: 1990: clause 3.4, 2.5kg rammer in a CBR mould
Preparation:	Original sample was natural, seperate specimens tested

Particle Density, Mg/m^3	2.21	assumed
Material > 37.5mm	4	%
Material < 37.5mm > 20mm	22	%

Derived Parameters ×	
Maximum Dry Density, Mg/m^3	1.76
Optimum Moisture Content %	11.1

Remarks: 'X' Sample tested at clients request. Gravel retained between 20 - 37.5mm was returned to the sample to make up 30%

QA Ref.	Apex Testing Solutions	Approver	Date	Fig.
BS1377 - 4	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ	D Simon	06/07/2018	COMP
Rev. 2.0	Tel: 01656 746762 Fax: 01656 749096	7771	D Simon, Laboratory Manager	

TEST REPORT

MOISTURE CONTENT

BS1377: Part 2: 1990 : Clause 3.2

Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Email:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP22	**Depth (m):**	1.20
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey slightly gravelly sandy SILT.
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	BS 1377
Date Received:	N/A	**Date Tested:**	04 July 2018

Test Results

Moisture Content (%)	38

Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig
BS1377-2 Rev. 2.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D simon	05/07/2018	**MC**
			D Simon, Laboratory Manager		

TEST REPORT

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

BS 1377:Part 2:1990: Clause 4.3/5.3/5.4

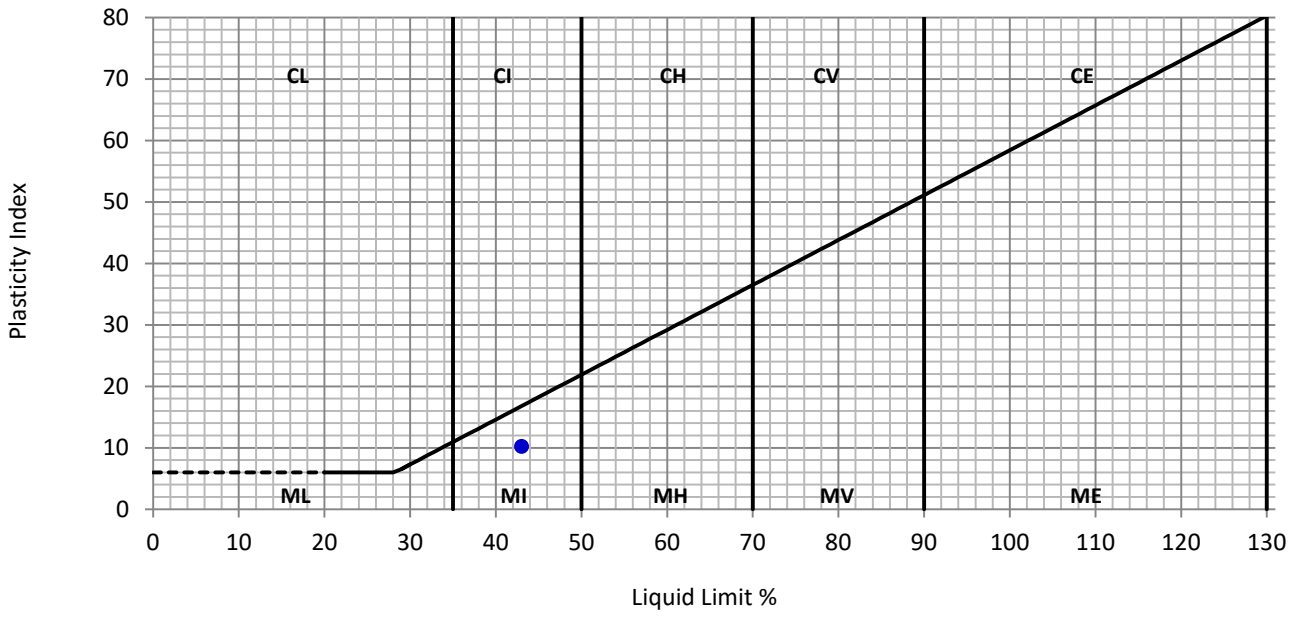
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Email:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP22	**Depth (m):**	1.20
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey slightly gravelly sandy SILT.
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	BS 1377
Date Received:	N/A	**Date Tested:**	03 July 2018

Test Results

Liquid Limit	43	%
Plastic Limit	33	%
Plasticity Index	10	%

Preparation:	4.2.3 Natural Specimen	
Proportion retained on 425µm sieve:	0	%



Remarks:

QA Ref.	**Apex Testing Solutions**		Approver	Date	Fig.
BS1377-2	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ		D Simon	04/07/2018	**ATT**
Rev 3.0	Tel: 01656 746762 Fax: 01656 749096	7771	D Simon, Laboratory Manager		

TEST REPORT

PARTICLE SIZE DISTRIBUTION ANALYSIS

BS 1377:Part 2:1990: Clause 9.2 / 9.4

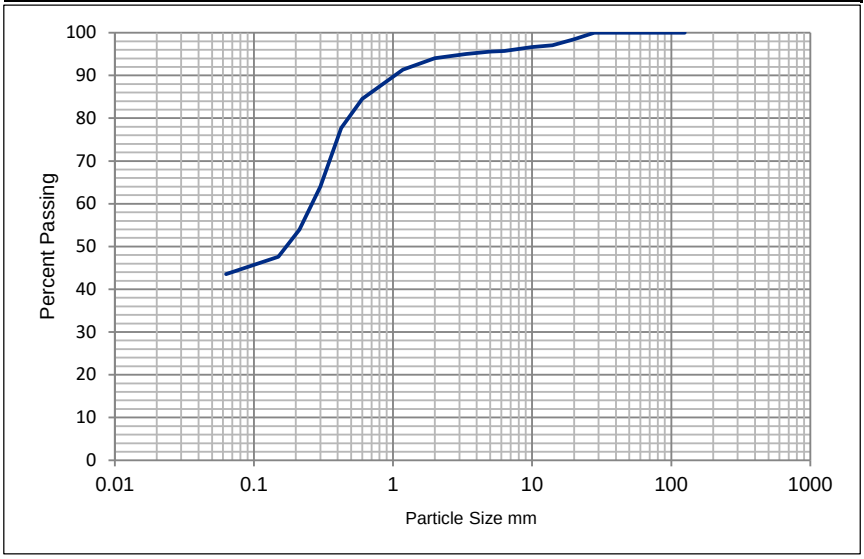
Project No:	D8176-18	**Client:**	Integral Geotechnique
Project Name:	Riverside, Merthyr Vale	**Email:**	7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX
ATS Sample No:	N/A		

Site Ref / Hole ID:	TP22	**Depth (m):**	1.20
Sample No:	N/A	**Sample Type:**	Bulk
Sampling Certificate Received:	No	**Material Description:**	Dark grey slightly gravelly sandy SILT.
Location in Works:	Unknown	**Material Source:**	N/A
Date Sampled:	N/A	**Material Supplier:**	N/A
Sampled By:	N/A	**Specification:**	BS 1377
Date Received:	N/A	**Date Tested:**	04 July 2018

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	98
14	97
10	97
6.3	96
5.0	96
3.35	95
2.00	94
1.18	91
0.600	85
0.425	78
0.300	64
0.212	54
0.150	48
0.063	44

Preparation / Pretreatment	
Sieve:	Pre dried
Pipette:	



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient
Cobbles / Boulders	0	N/A	D_{60} / D_{10}
Gravel	6		
Sand	50	**Dry mass of sample, kg**	
Silt / Clay	44	7.2	N/A

Remarks: Material complies with 2A & 2B grading requirements of SHW series 600

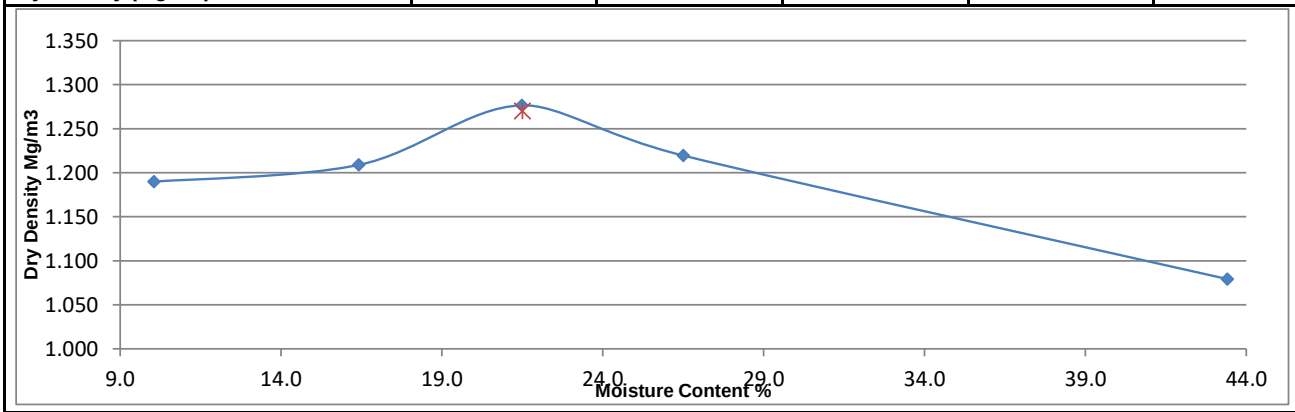
QA Ref.			Approver	Date	Fig
BS1377 - 2 Rev 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	D Simon	04/07/2018	**PSD**
			D Simon, Laboratory Manager		

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990

Clause 3.3 / 3.4 / 3.5 / 3.6 *Select as appropriate

Project Number:	D8176-18	**Project Name:**	Riverside, Merthyr Vale		
Sample ID:	TP22	**Depth m:**	**1.2**	**Sample No:**	N/A
Description:	Dark grey slightly sandy organic CLAY			**Date:**	**02-Jul**
Oven No(s):		Balance No(s):		Rammer Number:	
Sample Origin:* Natural / Air Dried / Oven Dried		Method of Breaking Down:* Chopping / Shredding		Sample used:* Single / Separate	
Total Mass of Sample (g)	21123	Particle Density (Mg/m3): *	2.02	assumed	
Mass of material retained on 37.5mm (g):	0	Material Retained on 37.5 mm BS Test Sieve (%):		0.00	
Mass of material retained on 20 mm (g):	0	Material Retained on 20 mm BS Test Sieve (%):		0.00	
Clause 3.3, 2.5kg rammer, litre mould - 3 layers 27 blows/layer		Clause 3.5, 4.5kg rammer, litre mould - 5 layers 27 blows/layer			
Clause 3.4, 2.5kg rammer, CBR mould - 3 layers 62 blows/layer		Clause 3.6, 4.5kg rammer, CBR mould - 5 layers 62 blows/layer			

Test Number:	**1**	**2**	**3**	**4**	**5**
*Proctor / CBR Mould Number	**34**	**34**	**34**	**34**	**34**
Diameter of mould mm					
Int. diameter of mould, D mm	**104.27**	**104.27**	**104.27**	**104.27**	**104.27**
Height of mould mm					
Int. height of mould, H1 mm	**115.01**	**115.01**	**115.01**	**115.01**	**115.01**
Height of mould & collar mm					
Int. height of collar & mould, H2 mm	**165.01**	**165.01**	**165.01**	**165.01**	**165.01**
Depth to Surface mm	45 46 / 49 49	45 47 / 46 44	45 46 / 46 45	44 43 / 45 45	47 47 / 45 45
Avg depth to surface, H3 mm	**47.25**	**45.50**	**45.50**	**44.25**	**46.00**
Height above mould, H2-1-3 mm	117.76	119.51	119.51	120.76	119.01
Volume of Mould (mL)	**982**	**982**	**982**	**982**	**982**
Mass of mould & wet soil (g):	5317	5413	5554	5546	5551
Mass of empty mould (g):	4031	4031	4031	4031	4031
Mass of wet soil (g):	1286	1382	1523	1515	1520
Bulk density (Mg/m3):	**1.309**	**1.407**	**1.551**	**1.543**	**1.548**
Container Number:					
Mass of container (g):	1306	1306	1318	1315	1300
Mass of wet soil & container (g):	2390	2292	2347	2365	2476
Mass of dry soil & container (g): (1)					
Mass of dry soil & container (g): (2)	2291	2153	2165	2145	2120
% difference					
Moisture Content (%):	**10.1**	**16.4**	**21.5**	**26.5**	**43.4**
Dry Density (Mg/m3):	**1.190**	**1.209**	**1.277**	**1.219**	**1.079**



Remarks:

Derived Parameters	**Maximum Dry Density**	**Mg/m^3**	**1.27**	**Optimum Moisture Content %**	21.5

QA Ref.	Technician		Date	
BS1377 - 4 Rev. 3.0	Checked		Date	

APPENDIX J

IN SITU TEST RESULTS – PLATE LOAD TESTS (DURING TURN AND COMPACT)

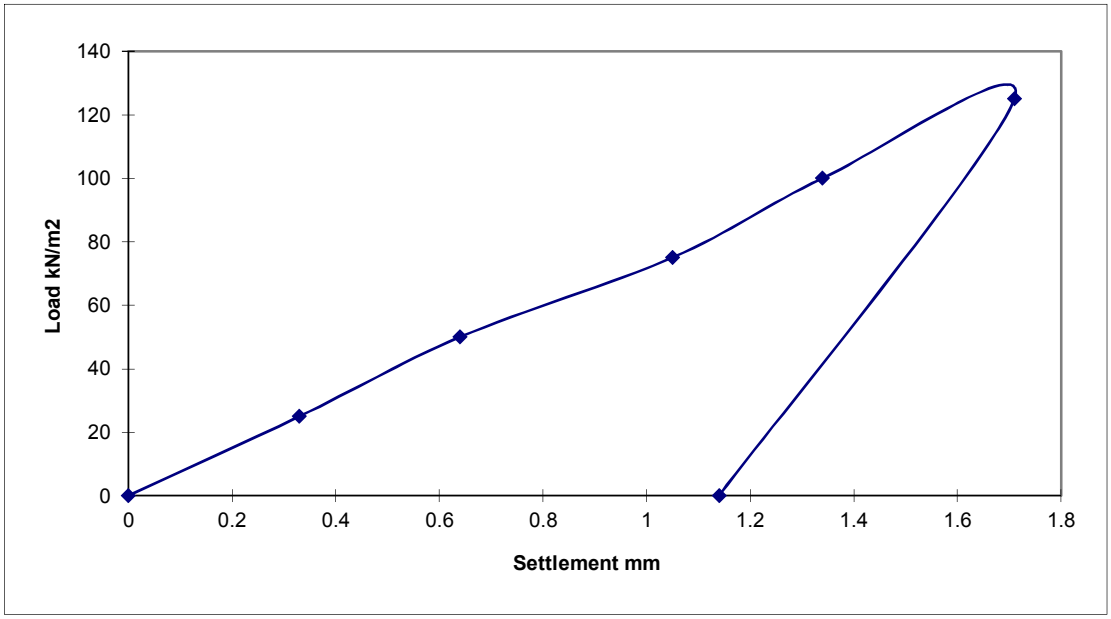
INTERIM

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P1	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow brown sandy CLAY with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.33	25	4
0.64	50	8
1.05	75	12
1.34	100	16
1.71	125	20
1.14	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 05.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 05.07.18

Test Reference: Test P1

Test Depth: Surface

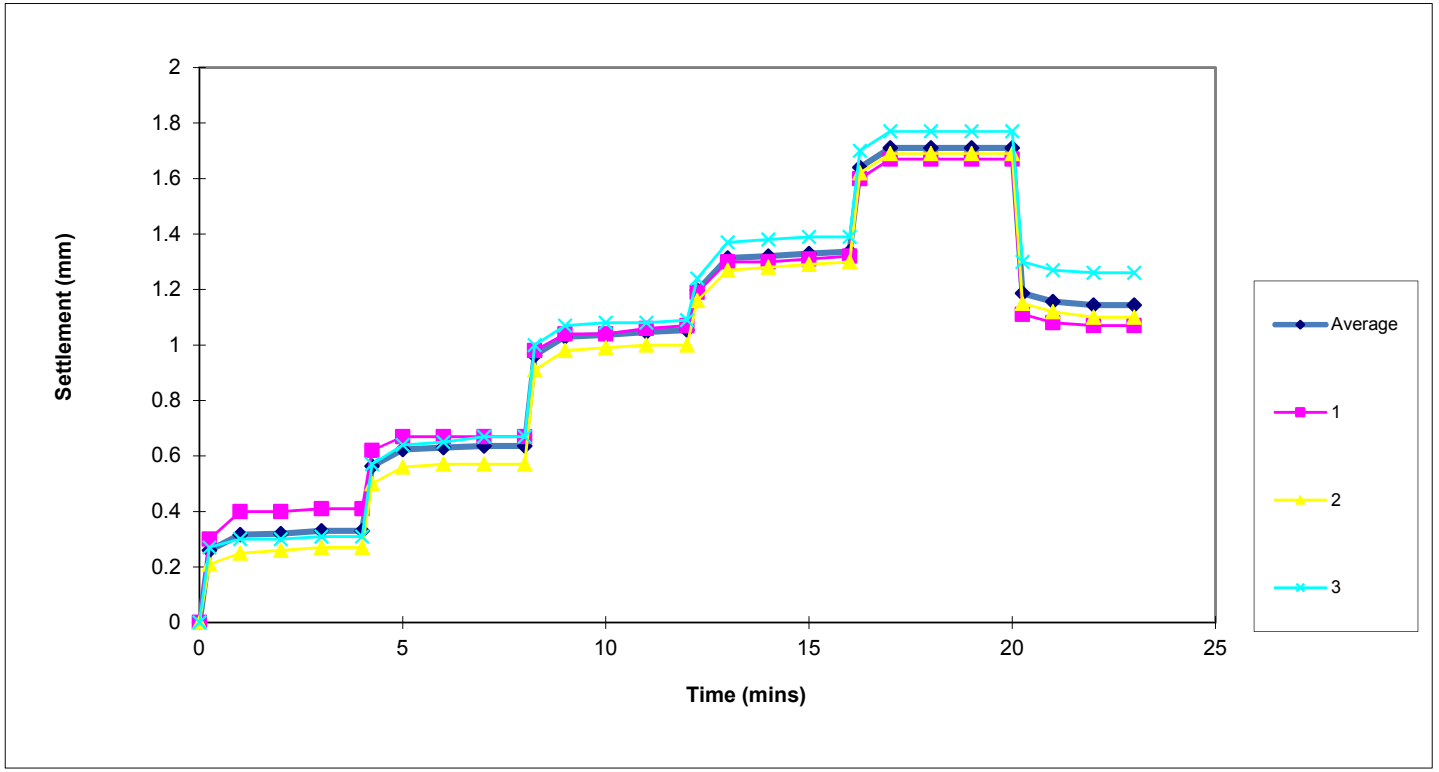
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.30	0.21	0.27	0.26
	1	0.40	0.25	0.30	0.32
	2	0.40	0.26	0.30	0.32
	3	0.41	0.27	0.31	0.33
	4	0.41	0.27	0.31	0.33
50kN/m^2 Load	4.25	0.62	0.50	0.57	0.56
	5	0.67	0.56	0.64	0.62
	6	0.67	0.57	0.65	0.63
	7	0.67	0.57	0.67	0.64
	8	0.67	0.57	0.67	0.64
75kN/m^2 Load	8.25	0.98	0.91	1.00	0.96
	9	1.04	0.98	1.07	1.03
	10	1.04	0.99	1.08	1.04
	11	1.06	1.00	1.08	1.05
	12	1.07	1.00	1.09	1.05
100kN/m^2 Load	12.25	1.19	1.16	1.24	1.20
	13	1.30	1.27	1.37	1.31
	14	1.30	1.28	1.38	1.32
	15	1.31	1.29	1.39	1.33
	16	1.32	1.30	1.39	1.34
125kN/m^2 Load	16.25	1.60	1.62	1.70	1.64
	17	1.67	1.69	1.77	1.71
	18	1.67	1.69	1.77	1.71
	19	1.67	1.69	1.77	1.71
	20	1.67	1.69	1.77	1.71
0kN/m^2 Unload	20.25	1.11	1.15	1.30	1.19
	21	1.08	1.12	1.27	1.16
	22	1.07	1.10	1.26	1.14
	23	1.07	1.10	1.26	1.14

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test 1



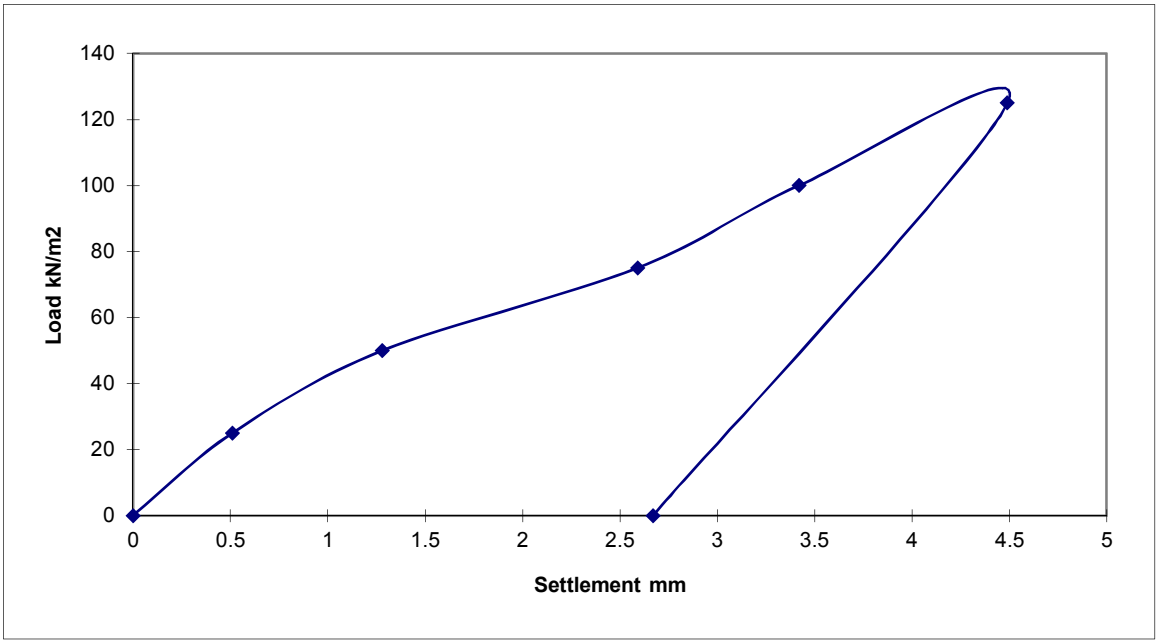
Contract:	Date:
Riverside, Merthyr Vale	05.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P2	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow brown sandy CLAY with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.51	25	4
1.28	50	8
2.59	75	12
3.42	100	16
4.49	125	20
2.67	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 05.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 05.07.18

Test Reference: Test P2

Test Depth: Surface

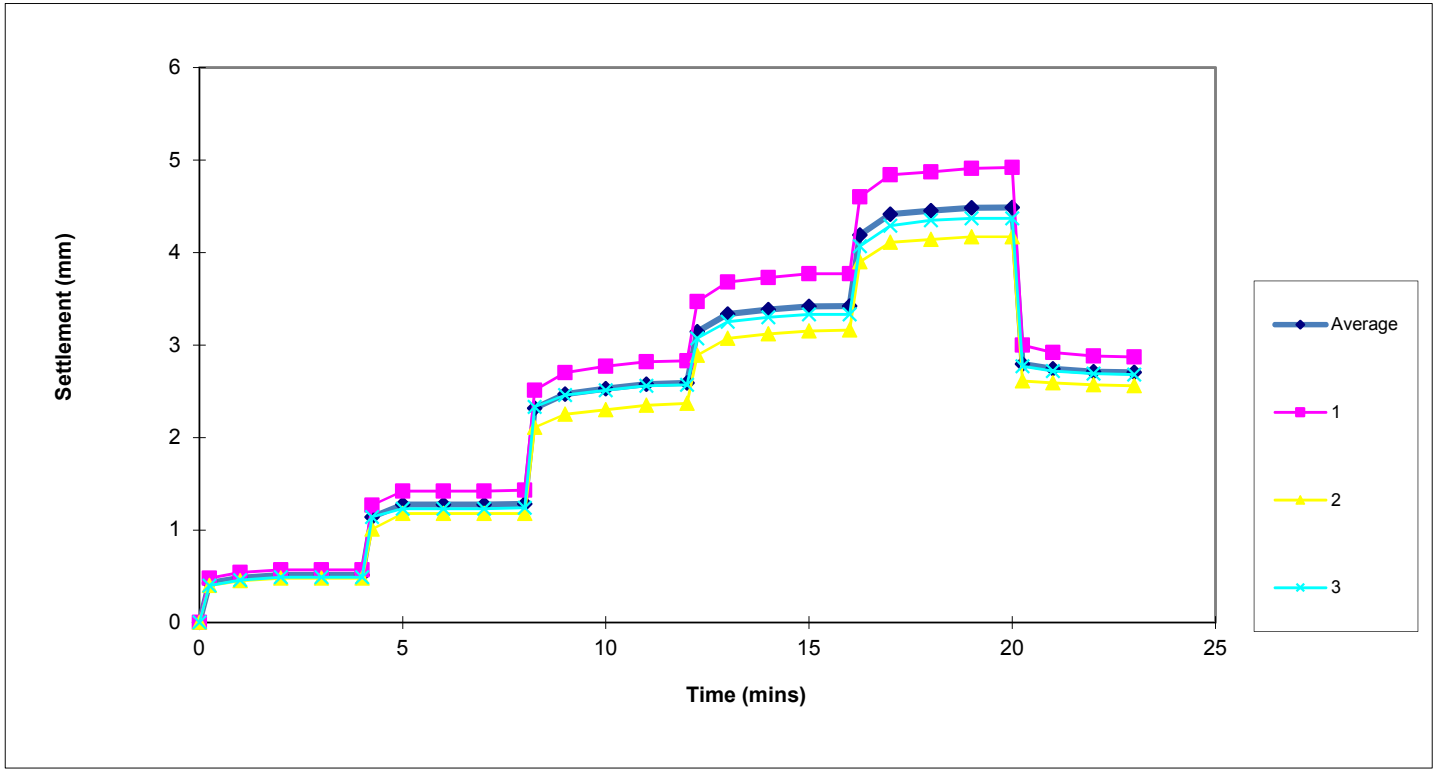
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.48	0.40	0.40	0.43
	1	0.54	0.45	0.46	0.48
	2	0.57	0.48	0.49	0.51
	3	0.57	0.48	0.49	0.51
	4	0.57	0.48	0.49	0.51
50kN/m^2 Load	4.25	1.27	1.01	1.14	1.14
	5	1.42	1.18	1.23	1.28
	6	1.42	1.18	1.23	1.28
	7	1.42	1.18	1.23	1.28
	8	1.43	1.18	1.24	1.28
75kN/m^2 Load	8.25	2.51	2.11	2.33	2.32
	9	2.70	2.25	2.46	2.47
	10	2.77	2.30	2.51	2.53
	11	2.82	2.35	2.56	2.58
	12	2.83	2.37	2.57	2.59
100kN/m^2 Load	12.25	3.47	2.89	3.07	3.14
	13	3.68	3.07	3.25	3.33
	14	3.73	3.12	3.30	3.38
	15	3.77	3.15	3.33	3.42
	16	3.77	3.16	3.33	3.42
125kN/m^2 Load	16.25	4.60	3.90	4.07	4.19
	17	4.84	4.11	4.29	4.41
	18	4.87	4.14	4.35	4.45
	19	4.91	4.17	4.37	4.48
	20	4.92	4.17	4.37	4.49
0kN/m^2 Unload	20.25	3.00	2.61	2.77	2.79
	21	2.92	2.59	2.72	2.74
	22	2.88	2.57	2.69	2.71
	23	2.87	2.56	2.68	2.70

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test 2



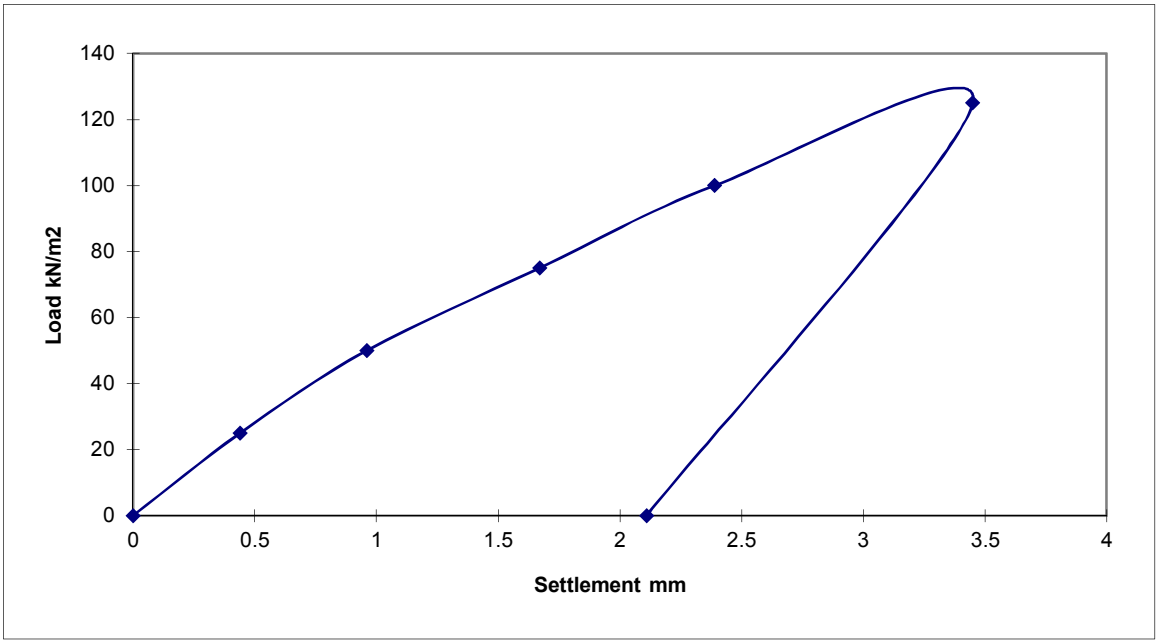
Contract:	Date:
Riverside, Merthyr Vale	05.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P3	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow brown sandy CLAY with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.44	25	4
0.96	50	8
1.67	75	12
2.39	100	16
3.45	125	20
2.11	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 05.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 05.07.18

Test Reference: Test P3

Test Depth: Surface

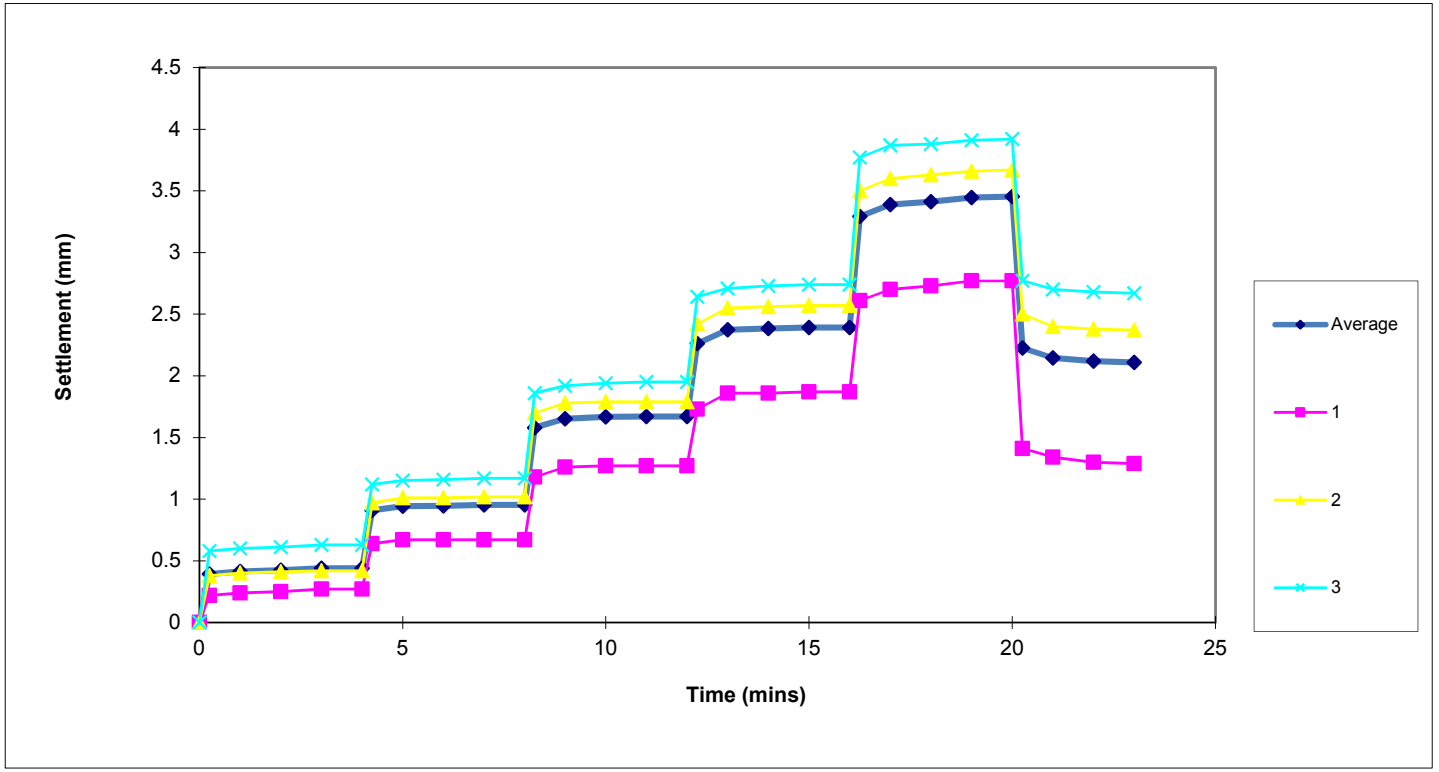
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.22	0.38	0.58	0.39
	1	0.24	0.40	0.60	0.41
	2	0.25	0.41	0.61	0.42
	3	0.27	0.42	0.63	0.44
	4	0.27	0.42	0.63	0.44
50kN/m^2 Load	4.25	0.64	0.97	1.12	0.91
	5	0.67	1.01	1.15	0.94
	6	0.67	1.01	1.16	0.95
	7	0.67	1.02	1.17	0.95
	8	0.67	1.02	1.17	0.95
75kN/m^2 Load	8.25	1.18	1.70	1.86	1.58
	9	1.26	1.78	1.92	1.65
	10	1.27	1.79	1.94	1.67
	11	1.27	1.79	1.95	1.67
	12	1.27	1.79	1.95	1.67
100kN/m^2 Load	12.25	1.73	2.42	2.64	2.26
	13	1.86	2.55	2.71	2.37
	14	1.86	2.56	2.73	2.38
	15	1.87	2.57	2.74	2.39
	16	1.87	2.57	2.74	2.39
125kN/m^2 Load	16.25	2.61	3.50	3.77	3.29
	17	2.70	3.60	3.87	3.39
	18	2.73	3.63	3.88	3.41
	19	2.77	3.66	3.91	3.45
	20	2.77	3.67	3.92	3.45
0kN/m^2 Unload	20.25	1.41	2.50	2.77	2.23
	21	1.34	2.40	2.70	2.15
	22	1.30	2.38	2.68	2.12
	23	1.29	2.37	2.67	2.11

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test 3



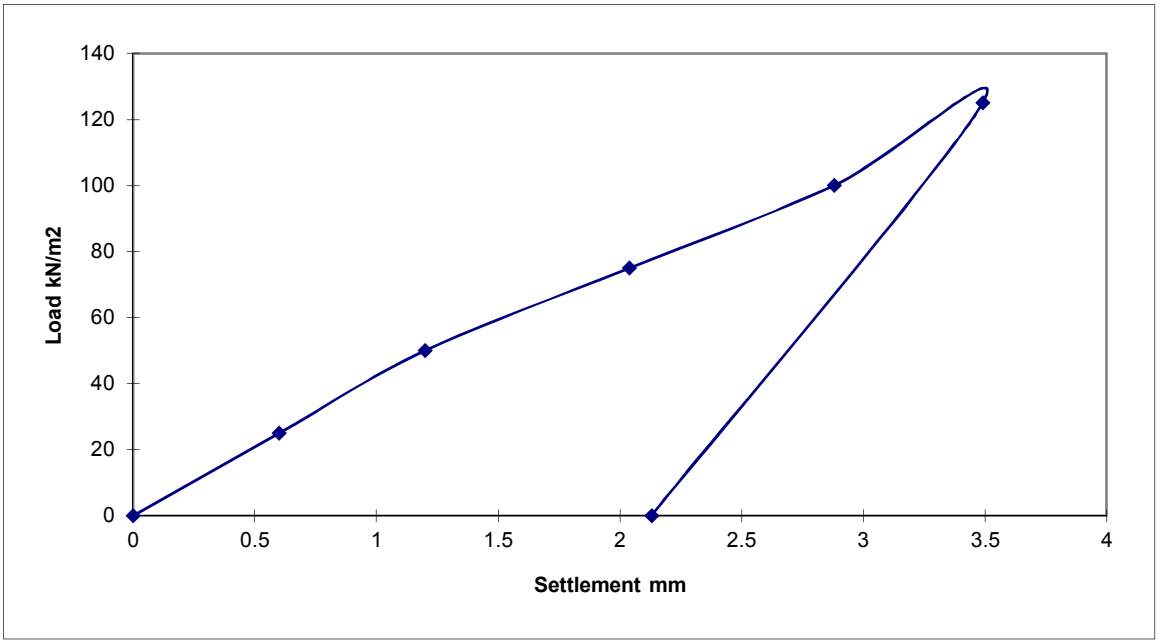
Contract: Riverside, Merthyr Vale	Date: 05.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P4	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow brown sandy CLAY with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.60	25	4
1.20	50	8
2.04	75	12
2.88	100	16
3.49	125	20
2.13	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 05.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 05.07.18

Test Reference: Test P4

Test Depth: Surface

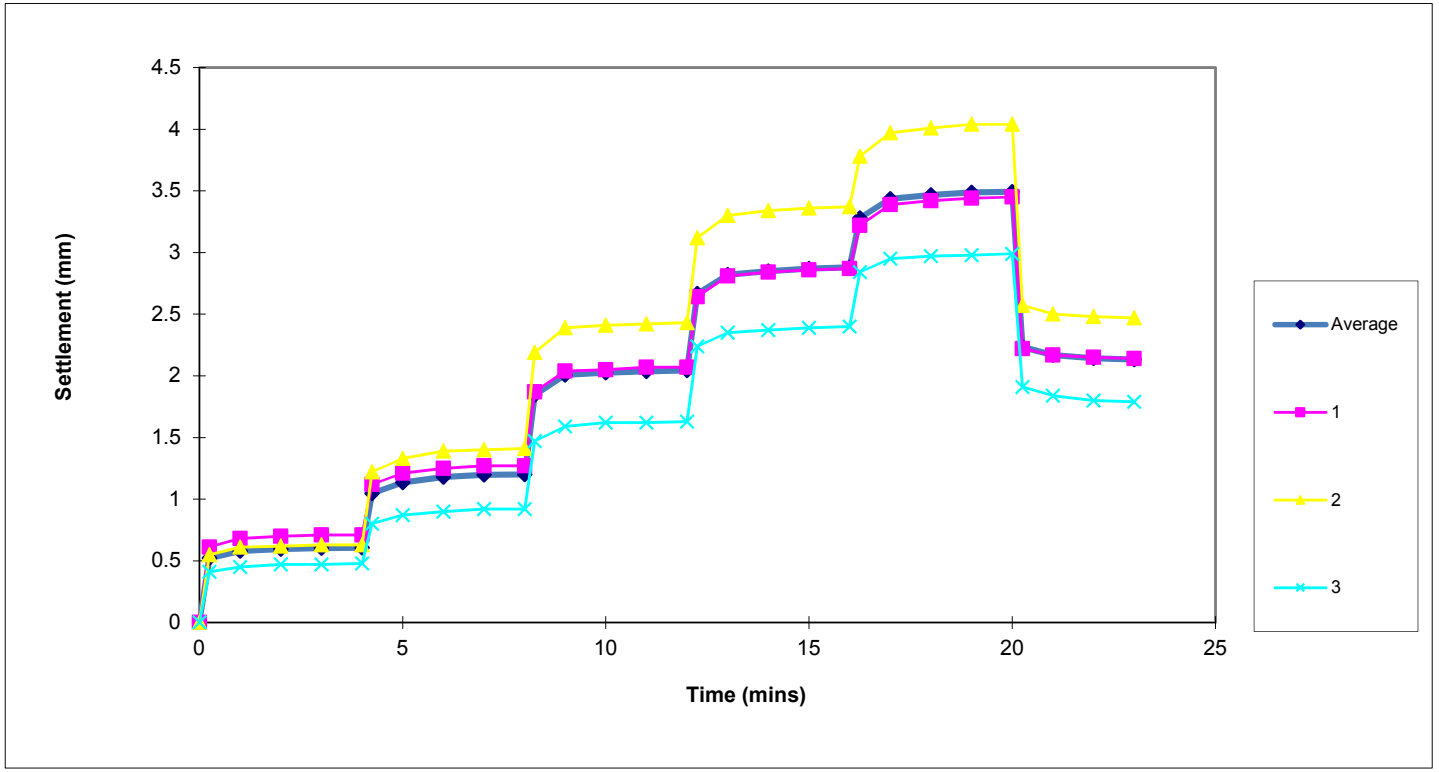
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.61	0.55	0.41	0.52
	1	0.68	0.61	0.45	0.58
	2	0.70	0.62	0.47	0.60
	3	0.71	0.63	0.47	0.60
	4	0.71	0.63	0.48	0.61
50kN/m^2 Load	4.25	1.12	1.22	0.80	1.05
	5	1.21	1.33	0.87	1.14
	6	1.25	1.39	0.90	1.18
	7	1.27	1.40	0.92	1.20
	8	1.27	1.41	0.92	1.20
75kN/m^2 Load	8.25	1.87	2.19	1.47	1.84
	9	2.04	2.39	1.59	2.01
	10	2.05	2.41	1.62	2.03
	11	2.07	2.42	1.62	2.04
	12	2.07	2.43	1.63	2.04
100kN/m^2 Load	12.25	2.64	3.12	2.24	2.67
	13	2.81	3.30	2.35	2.82
	14	2.84	3.34	2.37	2.85
	15	2.86	3.36	2.39	2.87
	16	2.87	3.37	2.40	2.88
125kN/m^2 Load	16.25	3.22	3.78	2.84	3.28
	17	3.39	3.97	2.95	3.44
	18	3.42	4.01	2.97	3.47
	19	3.44	4.04	2.98	3.49
	20	3.45	4.04	2.99	3.49
0kN/m^2 Unload	20.25	2.22	2.57	1.91	2.23
	21	2.17	2.50	1.84	2.17
	22	2.15	2.48	1.80	2.14
	23	2.14	2.47	1.79	2.13

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P4



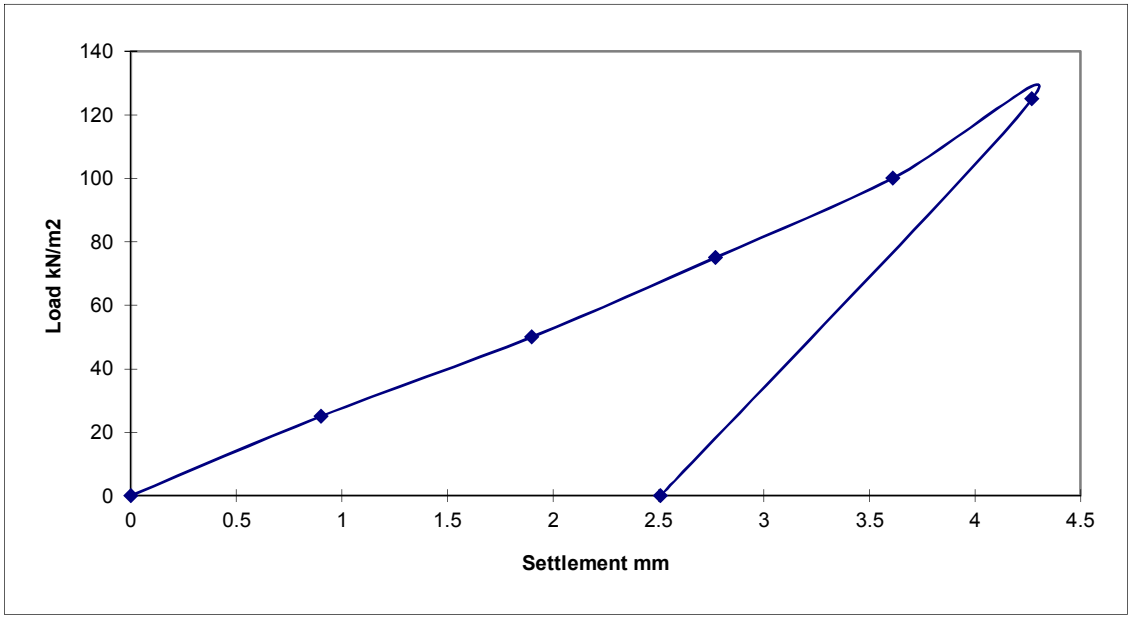
Contract:	Date:
Riverside, Merthyr Vale	05.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P5	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow brown sandy CLAY with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.90	25	4
1.90	50	8
2.77	75	12
3.61	100	16
4.27	125	20
2.51	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 05.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 05.07.18

Test Reference: Test P5

Test Depth: Surface

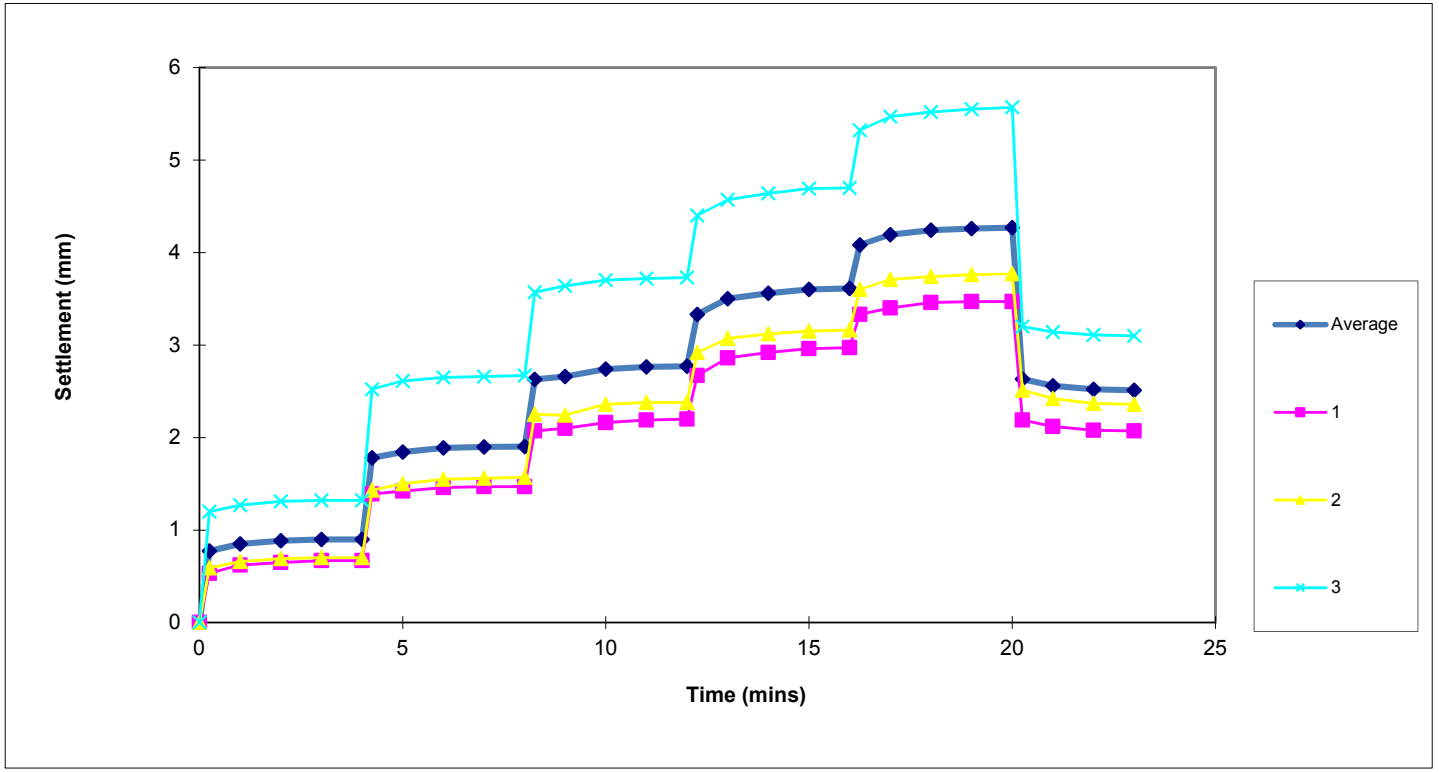
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.53	0.59	1.20	0.77
	1	0.62	0.66	1.27	0.85
	2	0.65	0.69	1.31	0.88
	3	0.67	0.70	1.32	0.90
	4	0.67	0.70	1.32	0.90
50kN/m^2 Load	4.25	1.39	1.43	2.52	1.78
	5	1.42	1.50	2.61	1.84
	6	1.46	1.55	2.65	1.89
	7	1.47	1.56	2.66	1.90
	8	1.47	1.57	2.67	1.90
75kN/m^2 Load	8.25	2.07	2.25	3.57	2.63
	9	2.10	2.24	3.64	2.66
	10	2.16	2.36	3.70	2.74
	11	2.19	2.38	3.72	2.76
	12	2.20	2.38	3.73	2.77
100kN/m^2 Load	12.25	2.67	2.92	4.40	3.33
	13	2.86	3.07	4.57	3.50
	14	2.92	3.12	4.64	3.56
	15	2.96	3.15	4.69	3.60
	16	2.97	3.16	4.70	3.61
125kN/m^2 Load	16.25	3.33	3.60	5.32	4.08
	17	3.40	3.71	5.47	4.19
	18	3.46	3.74	5.52	4.24
	19	3.47	3.76	5.55	4.26
	20	3.47	3.77	5.57	4.27
0kN/m^2 Unload	20.25	2.19	2.51	3.20	2.63
	21	2.12	2.42	3.14	2.56
	22	2.08	2.37	3.11	2.52
	23	2.07	2.36	3.10	2.51

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P5



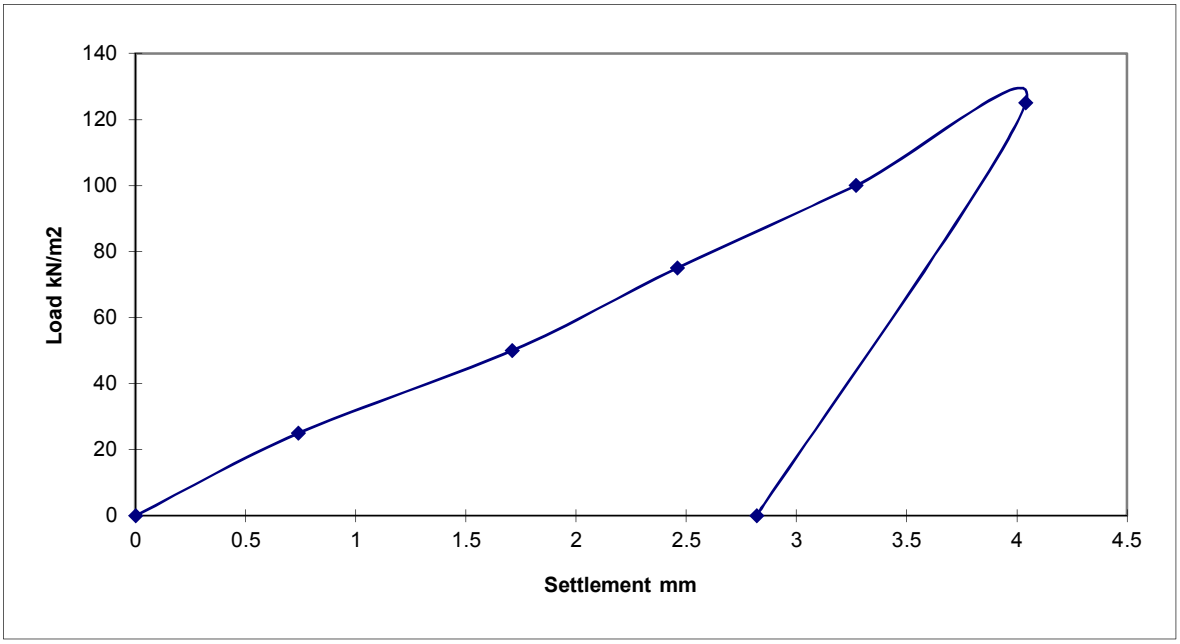
Contract:	Date:
Riverside, Merthyr Vale	05.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P6	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow brown sandy CLAY with cobbles

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.74	25	4
1.71	50	8
2.46	75	12
3.27	100	16
4.04	125	20
2.82	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 05.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 05.07.18

Test Reference: Test P6

Test Depth: Surface

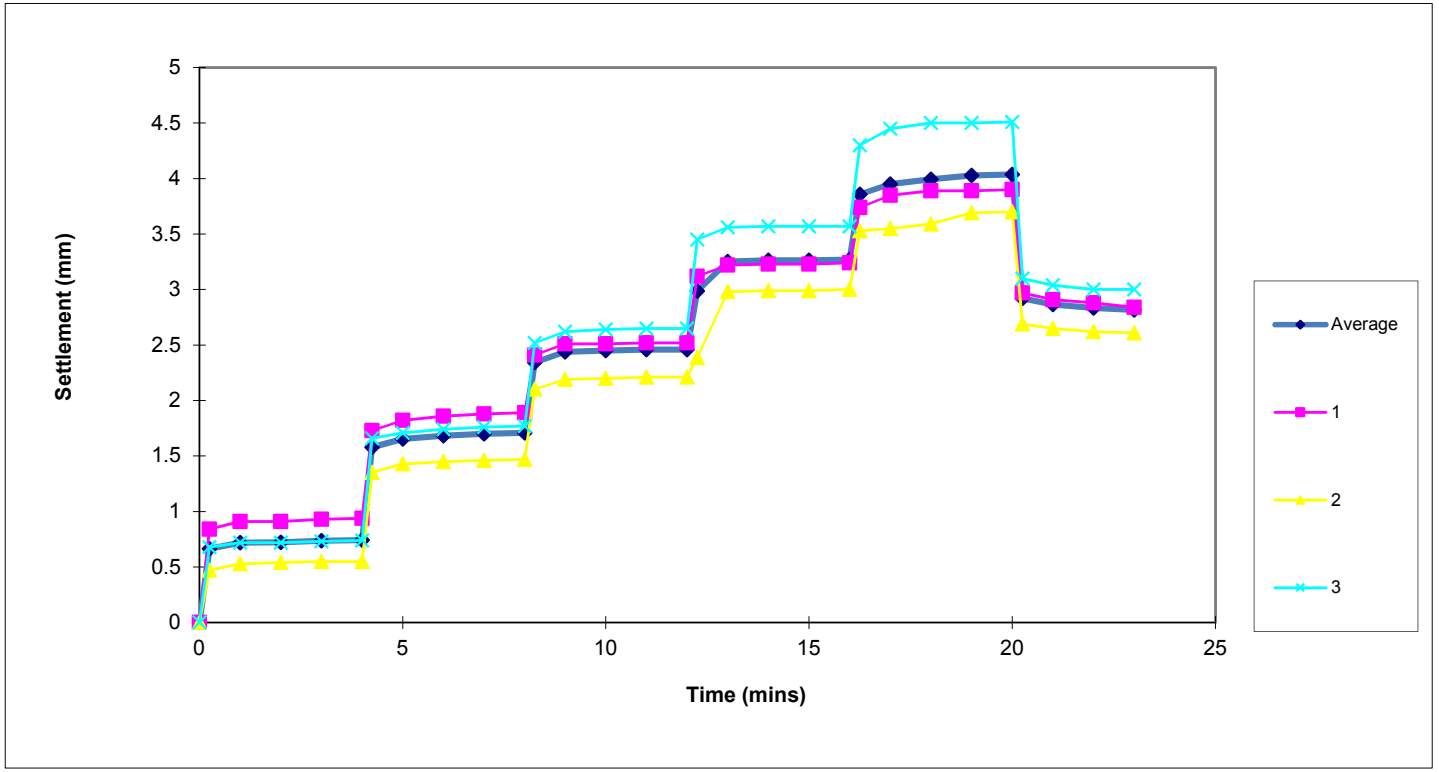
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.84	0.47	0.68	0.66
	1	0.91	0.53	0.72	0.72
	2	0.91	0.54	0.72	0.72
	3	0.93	0.55	0.73	0.74
	4	0.94	0.55	0.74	0.74
50kN/m^2 Load	4.25	1.73	1.35	1.66	1.58
	5	1.82	1.43	1.71	1.65
	6	1.86	1.45	1.74	1.68
	7	1.88	1.46	1.76	1.70
	8	1.89	1.47	1.77	1.71
75kN/m^2 Load	8.25	2.41	2.10	2.52	2.34
	9	2.51	2.19	2.62	2.44
	10	2.51	2.20	2.64	2.45
	11	2.52	2.21	2.65	2.46
	12	2.52	2.21	2.65	2.46
100kN/m^2 Load	12.25	3.12	2.39	3.45	2.99
	13	3.22	2.98	3.56	3.25
	14	3.23	2.99	3.57	3.26
	15	3.23	2.99	3.57	3.26
	16	3.24	3.00	3.57	3.27
125kN/m^2 Load	16.25	3.74	3.53	4.30	3.86
	17	3.85	3.55	4.45	3.95
	18	3.89	3.59	4.50	3.99
	19	3.89	3.69	4.50	4.03
	20	3.90	3.70	4.51	4.04
0kN/m^2 Unload	20.25	2.97	2.69	3.10	2.92
	21	2.91	2.65	3.04	2.87
	22	2.88	2.62	3.00	2.83
	23	2.84	2.61	3.00	2.82

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test 6



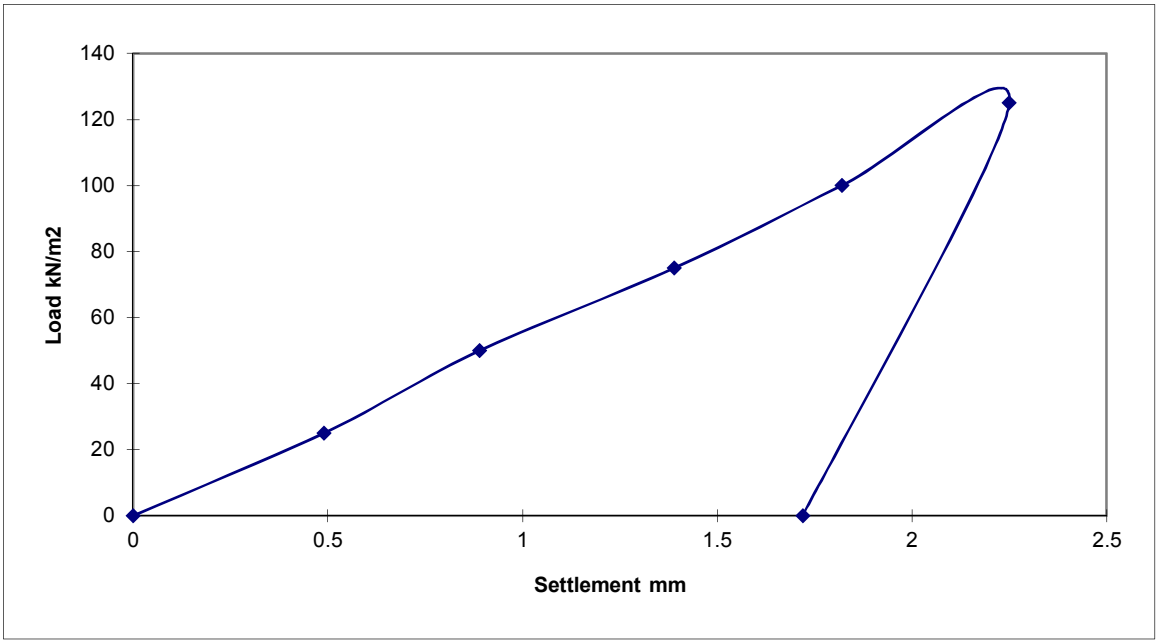
Contract:	Date:
Riverside, Merthyr Vale	05.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P7	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Black grey sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.49	25	4
0.89	50	8
1.39	75	12
1.82	100	16
2.25	125	20
1.72	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 09.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 09.07.18

Test Reference: Test P7

Test Depth: Surface

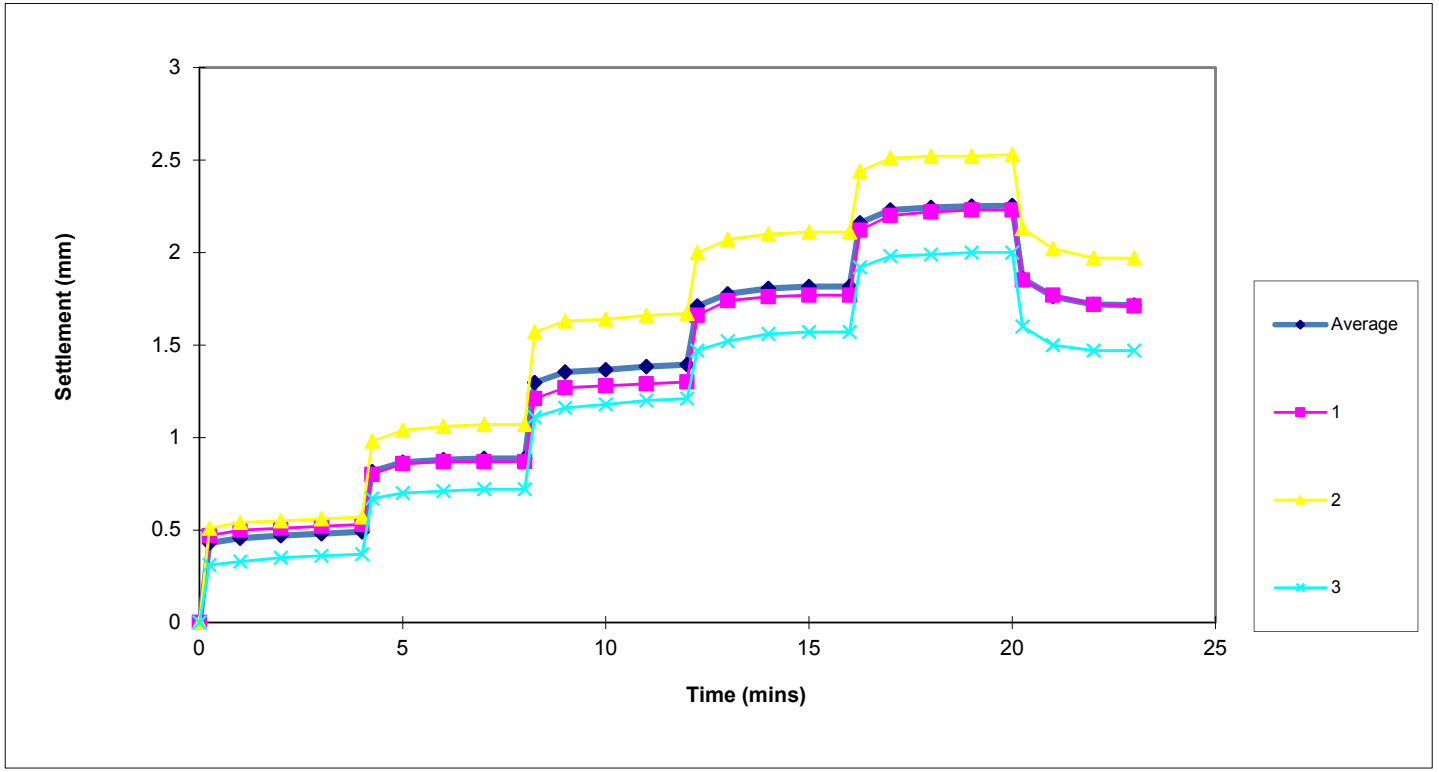
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.47	0.51	0.31	0.43
	1	0.50	0.54	0.33	0.46
	2	0.51	0.55	0.35	0.47
	3	0.52	0.56	0.36	0.48
	4	0.53	0.57	0.37	0.49
50kN/m^2 Load	4.25	0.80	0.98	0.67	0.82
	5	0.86	1.04	0.70	0.87
	6	0.87	1.06	0.71	0.88
	7	0.87	1.07	0.72	0.89
	8	0.87	1.07	0.72	0.89
75kN/m^2 Load	8.25	1.21	1.57	1.11	1.30
	9	1.27	1.63	1.16	1.35
	10	1.28	1.64	1.18	1.37
	11	1.29	1.66	1.20	1.38
	12	1.30	1.67	1.21	1.39
100kN/m^2 Load	12.25	1.66	2.00	1.47	1.71
	13	1.74	2.07	1.52	1.78
	14	1.76	2.10	1.56	1.81
	15	1.77	2.11	1.57	1.82
	16	1.77	2.11	1.57	1.82
125kN/m^2 Load	16.25	2.12	2.44	1.92	2.16
	17	2.20	2.51	1.98	2.23
	18	2.22	2.52	1.99	2.24
	19	2.23	2.52	2.00	2.25
	20	2.23	2.53	2.00	2.25
0kN/m^2 Unload	20.25	1.85	2.13	1.60	1.86
	21	1.77	2.02	1.50	1.76
	22	1.72	1.97	1.47	1.72
	23	1.71	1.97	1.47	1.72

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P7



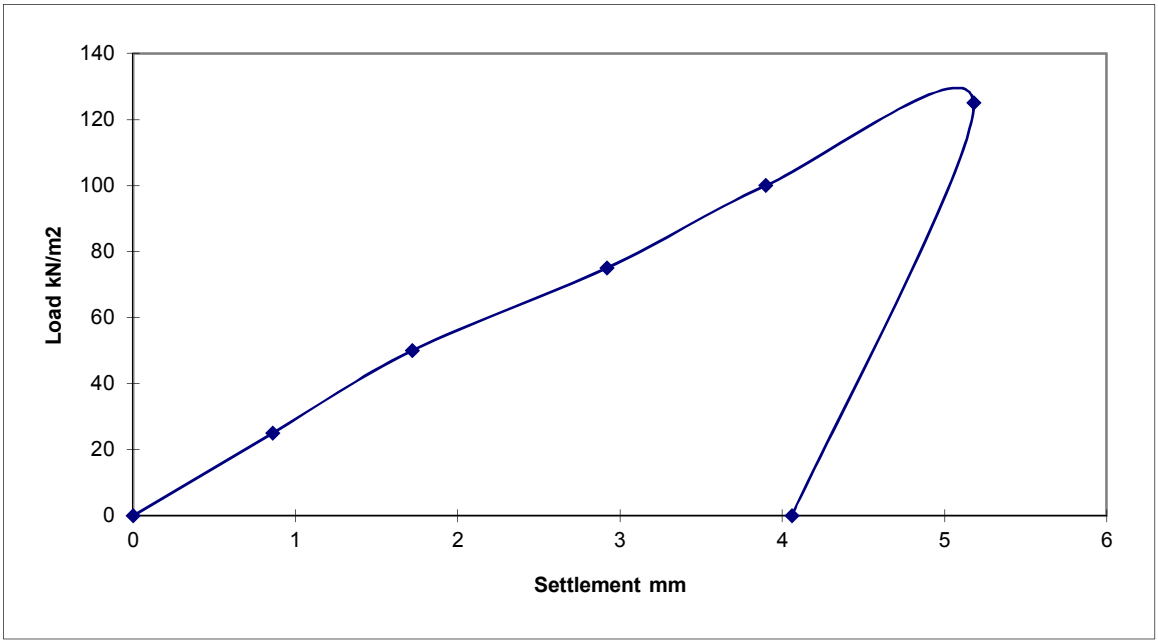
Contract:	Date:
Riverside, Merthyr Vale	09.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P8	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow Sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.86	25	4
1.72	50	8
2.92	75	12
3.90	100	16
5.18	125	20
4.06	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 09.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 09.07.18

Test Reference: Test P8

Test Depth: Surface

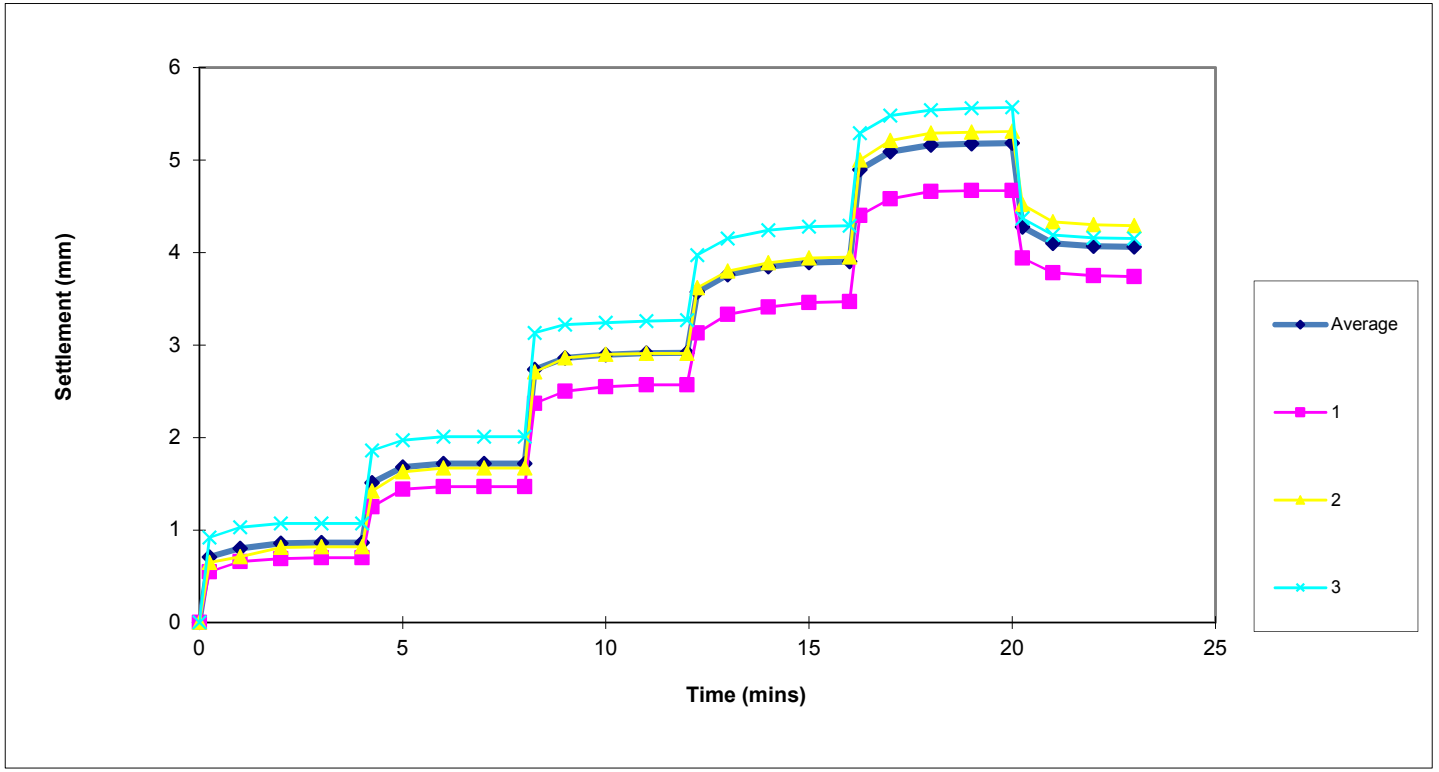
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.55	0.65	0.92	0.71
	1	0.66	0.71	1.03	0.80
	2	0.69	0.81	1.07	0.86
	3	0.70	0.82	1.07	0.86
	4	0.70	0.82	1.07	0.86
50kN/m^2 Load	4.25	1.25	1.42	1.86	1.51
	5	1.44	1.63	1.97	1.68
	6	1.47	1.67	2.01	1.72
	7	1.47	1.67	2.01	1.72
	8	1.47	1.67	2.01	1.72
75kN/m^2 Load	8.25	2.37	2.71	3.13	2.74
	9	2.50	2.86	3.22	2.86
	10	2.55	2.90	3.24	2.90
	11	2.57	2.91	3.26	2.91
	12	2.57	2.91	3.27	2.92
100kN/m^2 Load	12.25	3.13	3.62	3.97	3.57
	13	3.33	3.80	4.15	3.76
	14	3.41	3.89	4.24	3.85
	15	3.46	3.94	4.28	3.89
	16	3.47	3.95	4.29	3.90
125kN/m^2 Load	16.25	4.40	5.00	5.29	4.90
	17	4.58	5.21	5.48	5.09
	18	4.66	5.29	5.54	5.16
	19	4.67	5.30	5.56	5.18
	20	4.67	5.31	5.57	5.18
0kN/m^2 Unload	20.25	3.94	4.52	4.37	4.28
	21	3.78	4.33	4.19	4.10
	22	3.75	4.30	4.16	4.07
	23	3.74	4.29	4.15	4.06

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P8



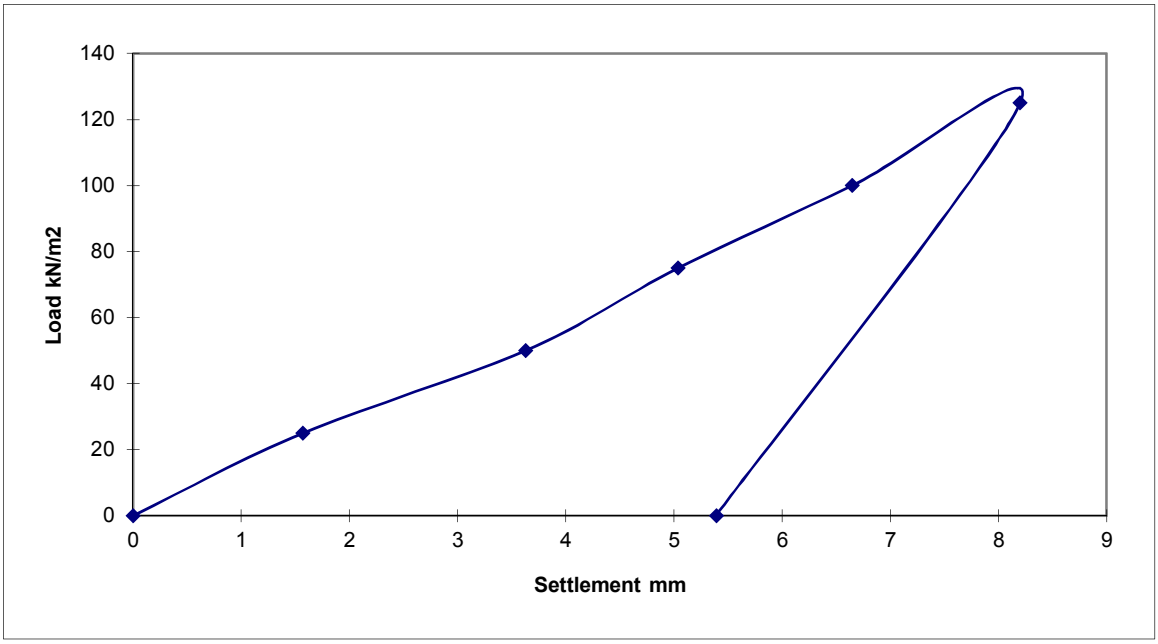
Contract:	Date:
Riverside, Merthyr Vale	09.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P9	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow Sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.57	25	4
3.63	50	8
5.04	75	12
6.65	100	16
8.20	125	20
5.39	0	24



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 09.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

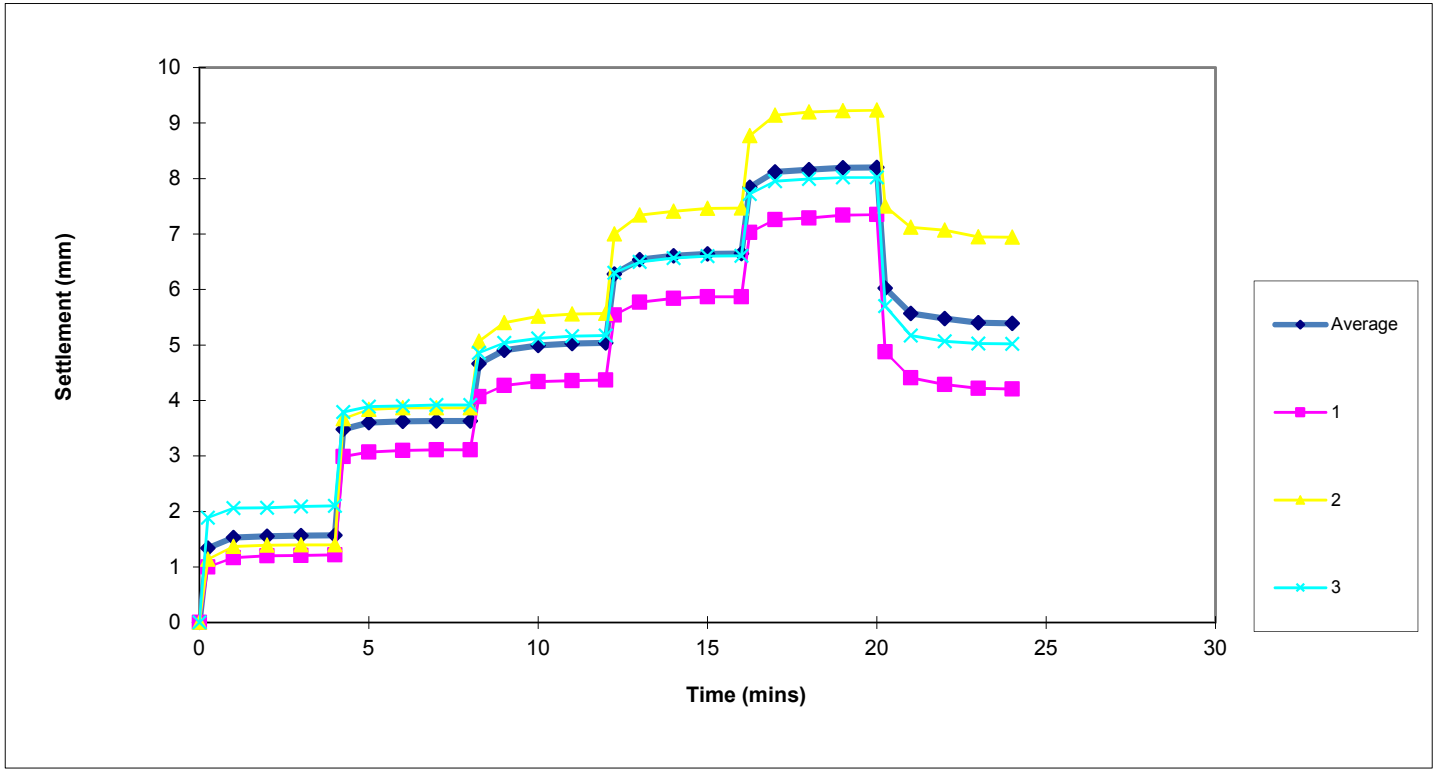
Contract: Riverside, Merthyr Vale | Date: 09.07.18

Test Reference: Test P9 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	1.00	1.14	1.89	1.34
	1	1.17	1.37	2.06	1.53
	2	1.20	1.39	2.07	1.55
	3	1.21	1.40	2.09	1.57
	4	1.22	1.40	2.10	1.57
50kN/m^2 Load	4.25	2.99	3.67	3.79	3.48
	5	3.07	3.84	3.89	3.60
	6	3.10	3.87	3.90	3.62
	7	3.11	3.87	3.92	3.63
	8	3.11	3.87	3.92	3.63
75kN/m^2 Load	8.25	4.07	5.07	4.86	4.67
	9	4.27	5.40	5.04	4.90
	10	4.34	5.52	5.12	4.99
	11	4.36	5.56	5.16	5.03
	12	4.37	5.57	5.17	5.04
100kN/m^2 Load	12.25	5.54	7.00	6.30	6.28
	13	5.77	7.34	6.50	6.54
	14	5.84	7.41	6.57	6.61
	15	5.87	7.46	6.60	6.64
	16	5.87	7.47	6.61	6.65
125kN/m^2 Load	16.25	7.03	8.77	7.72	7.84
	17	7.26	9.14	7.95	8.12
	18	7.29	9.20	7.99	8.16
	19	7.34	9.22	8.02	8.19
	20	7.35	9.23	8.02	8.20
0kN/m^2 Unload	20.25	4.88	7.50	5.70	6.03
	21	4.41	7.12	5.17	5.57
	22	4.29	7.07	5.07	5.48
	23	4.22	6.95	5.03	5.40
	24	4.21	6.94	5.02	5.39

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test 9



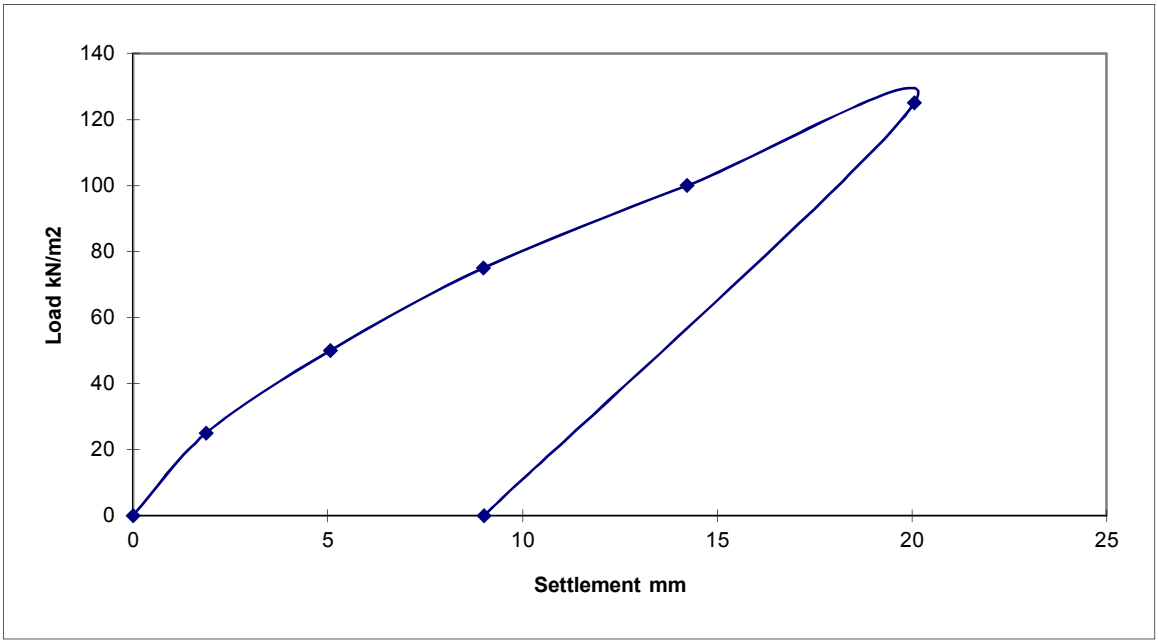
Contract:	Date:
Riverside, Merthyr Vale	09.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P10	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow Sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.88	25	4
5.06	50	8
9.00	75	13
14.23	100	20
20.06	125	30
9.01	0	35



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 09.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

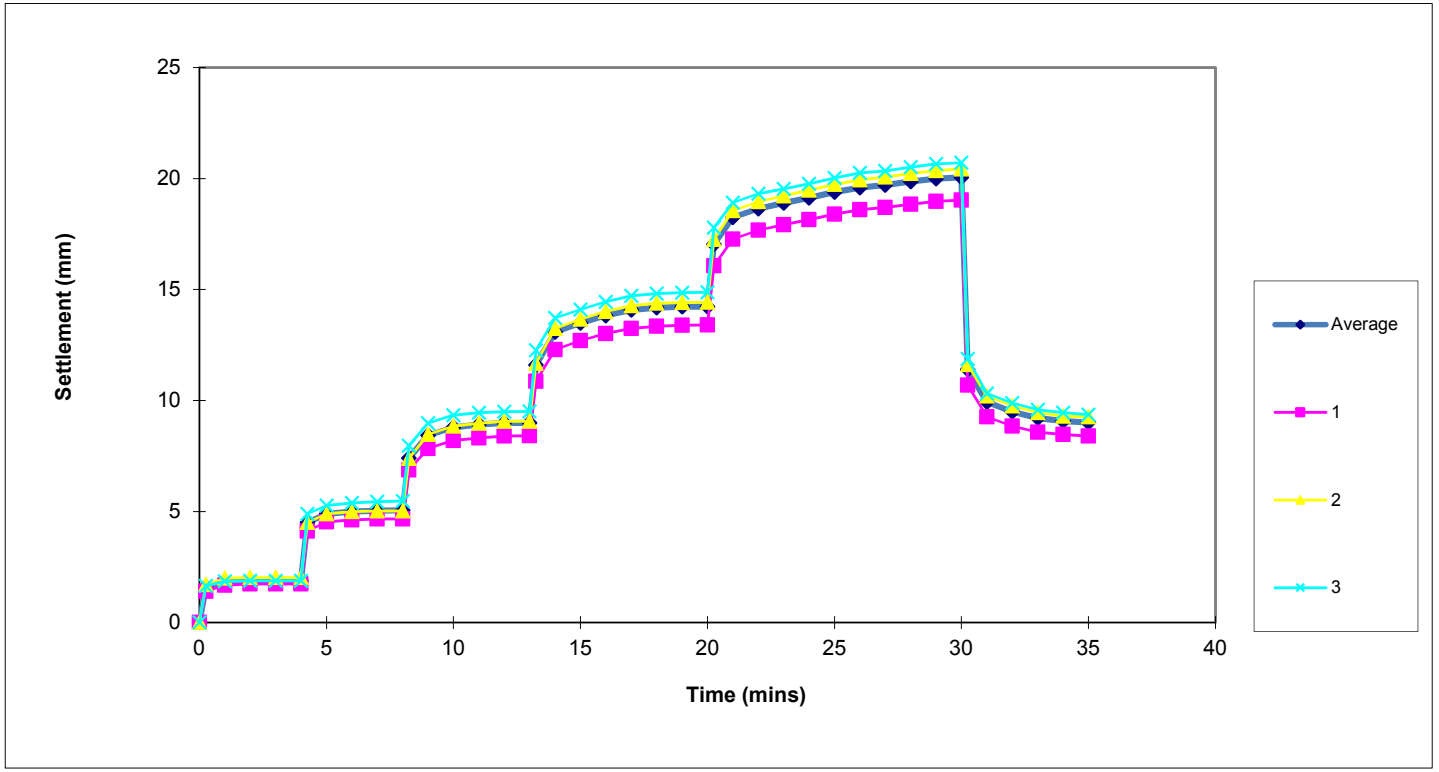
Contract: Riverside, Merthyr Vale | Date: 09.07.18

Test Reference: Test P10 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	1.41	1.71	1.65	1.59
	1	1.68	1.99	1.85	1.84
	2	1.73	2.03	1.88	1.88
	3	1.73	2.03	1.88	1.88
	4	1.73	2.03	1.88	1.88
50kN/m^2 Load	4.25	4.12	4.51	4.89	4.51
	5	4.53	4.89	5.27	4.90
	6	4.62	4.99	5.39	5.00
	7	4.66	5.03	5.45	5.05
	8	4.67	5.03	5.47	5.06
75kN/m^2 Load	8.25	6.87	7.39	7.97	7.41
	9	7.84	8.47	8.98	8.43
	10	8.20	8.84	9.34	8.79
	11	8.32	8.98	9.45	8.92
	12	8.40	9.06	9.50	8.99
	13	8.41	9.07	9.51	9.00
100kN/m^2 Load	13.25	10.87	11.68	12.27	11.61
	14	12.30	13.24	13.72	13.09
	15	12.70	13.67	14.10	13.49
	16	13.01	14.01	14.44	13.82
	17	13.25	14.27	14.72	14.08
	18	13.35	14.38	14.82	14.18
	19	13.39	14.42	14.86	14.22
	20	13.40	14.43	14.87	14.23
125kN/m^2 Load	20.25	16.07	17.25	17.79	17.04
	21	17.27	18.55	18.92	18.25
	22	17.67	18.95	19.32	18.65
	23	17.92	19.22	19.54	18.89
	24	18.15	19.48	19.77	19.13
	25	18.40	19.74	20.02	19.39
	26	18.59	19.94	20.25	19.59
	27	18.70	20.07	20.34	19.70
	28	18.84	20.22	20.52	19.86
	29	18.97	20.36	20.66	20.00
	30	19.03	20.43	20.71	20.06
0kN/m^2 Unload	30.25	10.70	11.62	11.87	11.40
	31	9.27	10.21	10.32	9.93
	32	8.85	9.75	9.88	9.49
	33	8.58	9.46	9.58	9.21
	34	8.47	9.30	9.46	9.08
	35	8.40	9.26	9.37	9.01

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P10



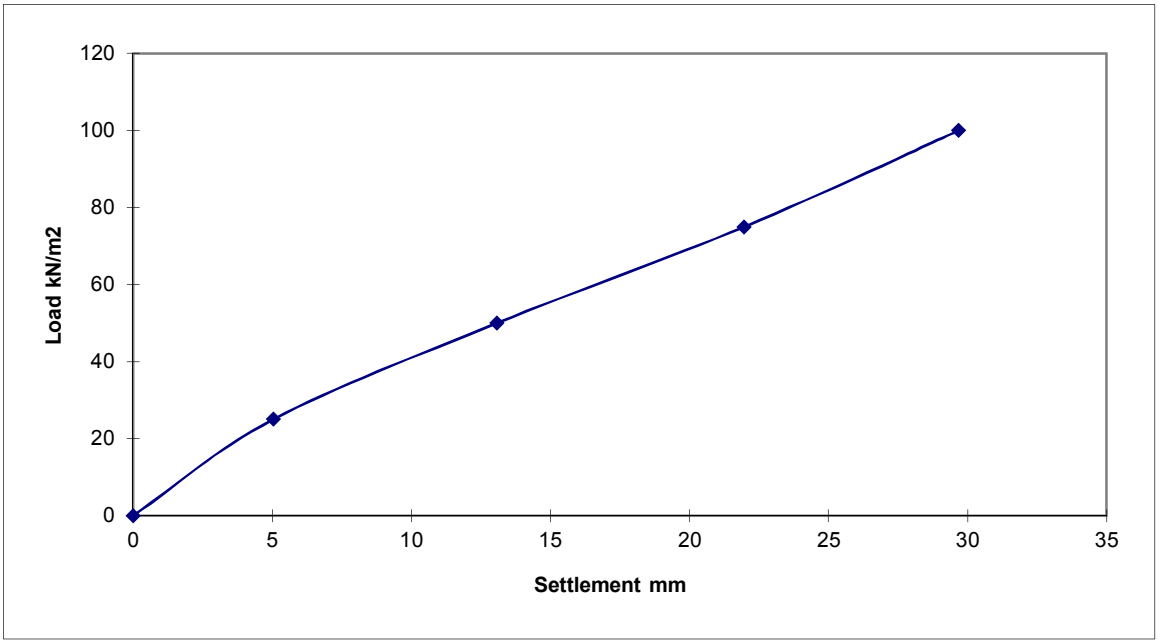
Contract:	Date:
Riverside, Merthyr Vale	09.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P10A	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow Sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
5.04	25	5
13.08	50	10
21.97	75	15
29.68	100	17



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.
Test terminated early due to excessive travel. (Very spongey)

CONTRACT: Riverside, Merthyr Vale	Date: 09.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

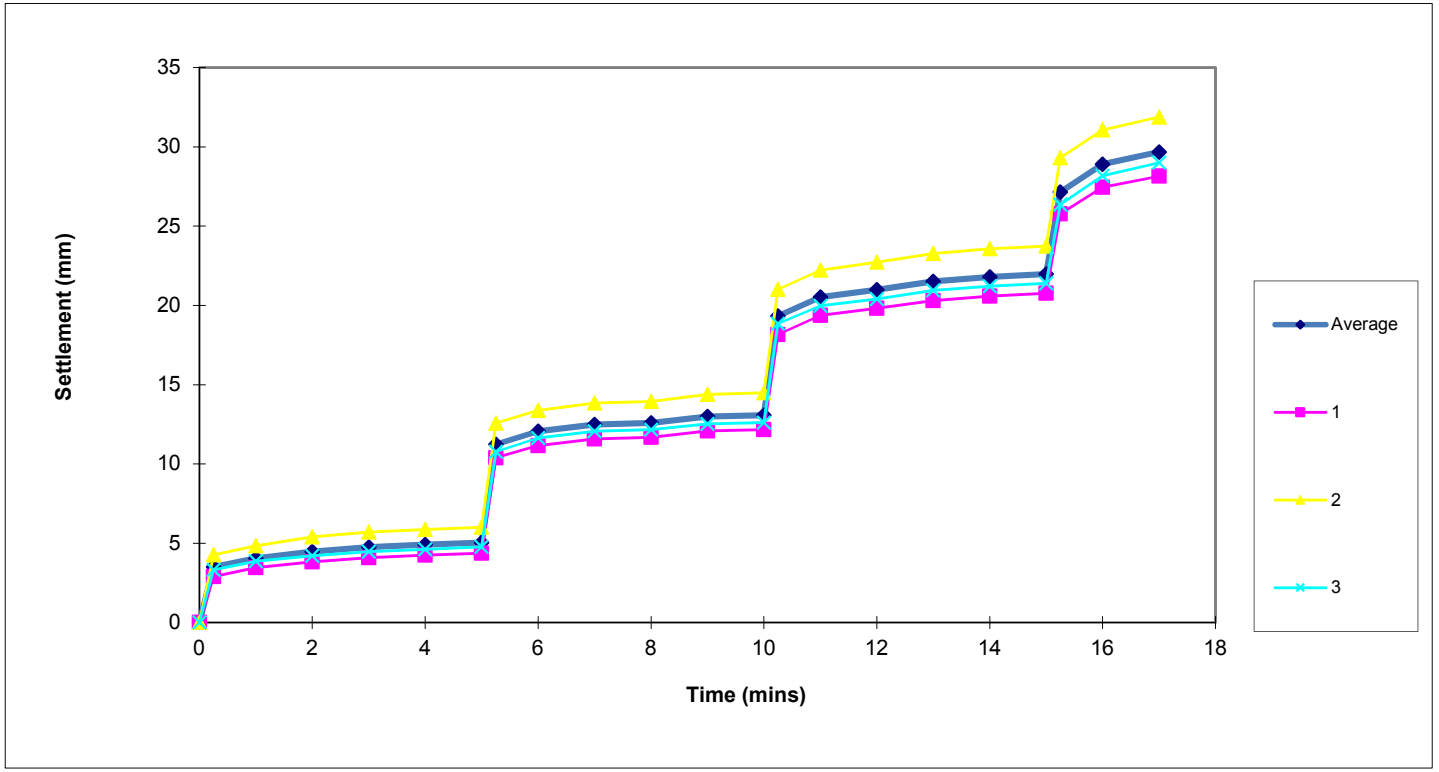
Contract: Riverside, Merthyr Vale | Date: 09.07.18

Test Reference: Test P10A | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	2.89	4.26	3.33	3.49
	1	3.46	4.84	3.87	4.06
	2	3.82	5.39	4.20	4.47
	3	4.09	5.70	4.47	4.75
	4	4.25	5.86	4.62	4.91
	5	4.36	6.00	4.77	5.04
50kN/m^2 Load	5.25	10.39	12.56	10.77	11.24
	6	11.15	13.38	11.63	12.05
	7	11.58	13.84	12.07	12.50
	8	11.67	13.95	12.17	12.60
	9	12.08	14.39	12.53	13.00
	10	12.16	14.48	12.60	13.08
75kN/m^2 Load	10.25	18.17	21.00	18.84	19.34
	11	19.37	22.22	19.97	20.52
	12	19.82	22.73	20.41	20.99
	13	20.31	23.27	20.95	21.51
	14	20.58	23.57	21.21	21.79
	15	20.77	23.74	21.40	21.97
100kN/m^2 Load	15.25	25.77	29.31	26.36	27.15
	16	27.44	31.07	28.18	28.90
	17	28.15	31.88	29.00	29.68

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P10A



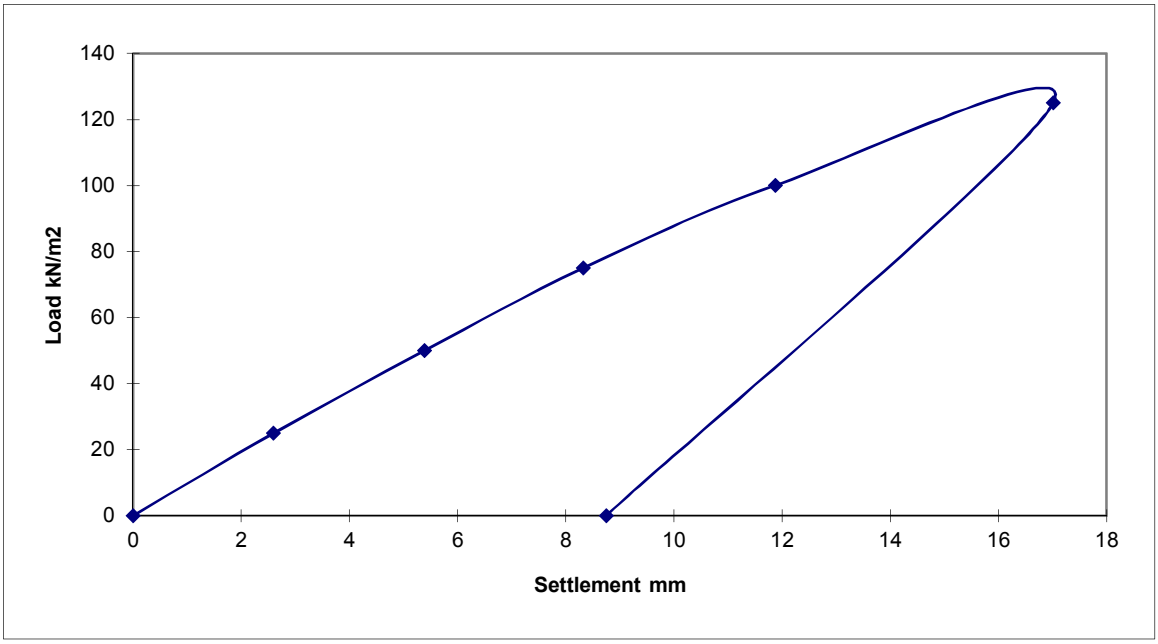
Contract:	Date:
Riverside, Merthyr Vale	09.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P11	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow Sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
2.60	25	4
5.39	50	8
8.32	75	13
11.87	100	20
17.01	125	30
8.75	0	35



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 09.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

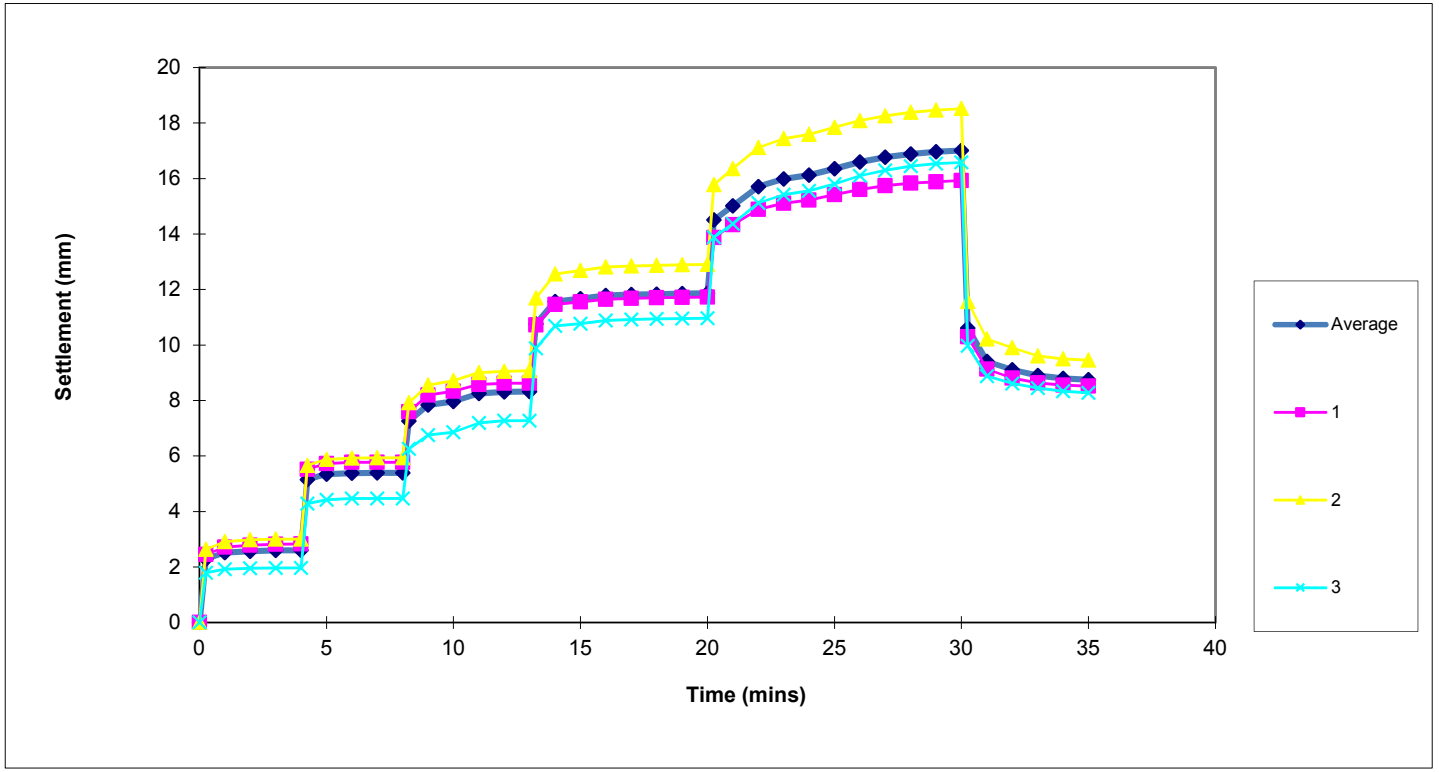
Contract: Riverside, Merthyr Vale | Date: 09.07.18

Test Reference: Test P11 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	2.45	2.64	1.79	2.29
	1	2.72	2.91	1.92	2.52
	2	2.78	2.98	1.95	2.57
	3	2.82	3.00	1.97	2.60
	4	2.83	3.01	1.97	2.60
50kN/m^2 Load	4.25	5.52	5.66	4.28	5.15
	5	5.73	5.88	4.42	5.34
	6	5.77	5.92	4.47	5.39
	7	5.77	5.93	4.47	5.39
	8	5.77	5.93	4.47	5.39
75kN/m^2 Load	8.25	7.60	7.92	6.26	7.26
	9	8.20	8.56	6.76	7.84
	10	8.33	8.72	6.86	7.97
	11	8.58	9.00	7.19	8.26
	12	8.62	9.05	7.27	8.31
	13	8.62	9.07	7.27	8.32
100kN/m^2 Load	13.25	10.72	11.69	9.88	10.76
	14	11.46	12.56	10.69	11.57
	15	11.56	12.69	10.77	11.67
	16	11.65	12.81	10.89	11.78
	17	11.68	12.85	10.92	11.82
	18	11.70	12.87	10.94	11.84
	19	11.72	12.89	10.96	11.86
	20	11.73	12.90	10.97	11.87
125kN/m^2 Load	20.25	13.87	15.78	13.88	14.51
	21	14.33	16.35	14.37	15.02
	22	14.89	17.12	15.12	15.71
	23	15.11	17.44	15.42	15.99
	24	15.22	17.59	15.56	16.12
	25	15.42	17.84	15.80	16.35
	26	15.60	18.08	16.10	16.59
	27	15.74	18.26	16.30	16.77
	28	15.83	18.39	16.45	16.89
	29	15.88	18.47	16.54	16.96
	30	15.93	18.52	16.58	17.01
0kN/m^2 Unload	30.25	10.30	11.57	9.97	10.61
	31	9.13	10.22	8.88	9.41
	32	8.81	9.91	8.61	9.11
	33	8.64	9.60	8.45	8.90
	34	8.56	9.50	8.33	8.80
	35	8.52	9.45	8.28	8.75

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P11



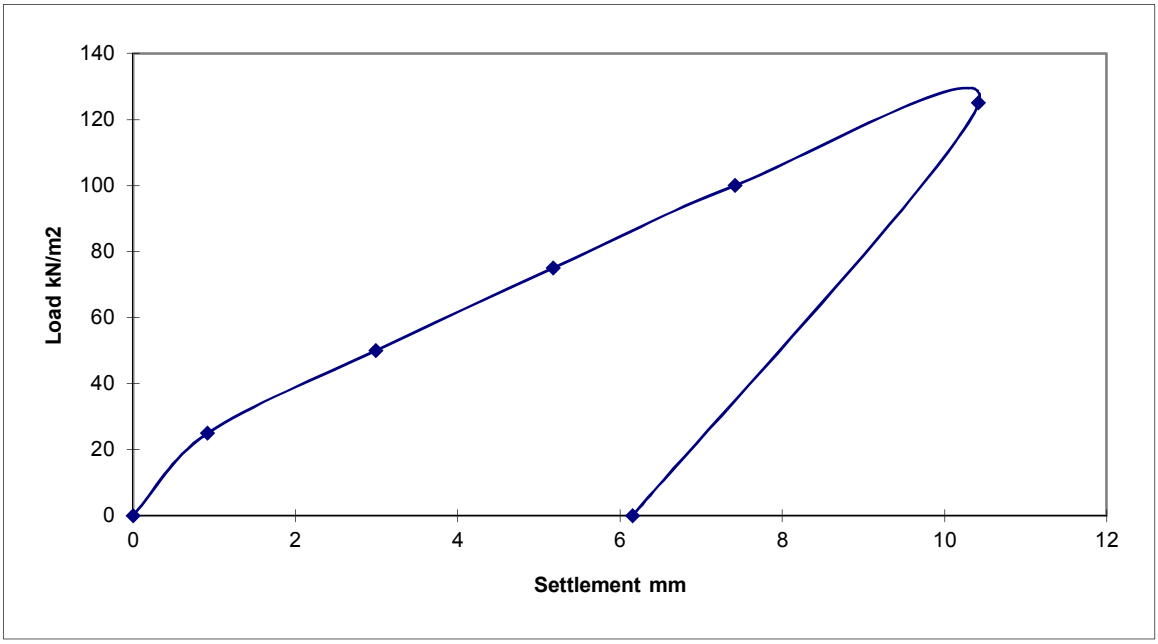
Contract:	Date:
Riverside, Merthyr Vale	09.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P12	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow Sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.92	25	4
2.99	50	8
5.18	75	12
7.42	100	16
10.42	125	21
6.16	0	25



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 09.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 09.07.18

Test Reference: Test P12

Test Depth: Surface

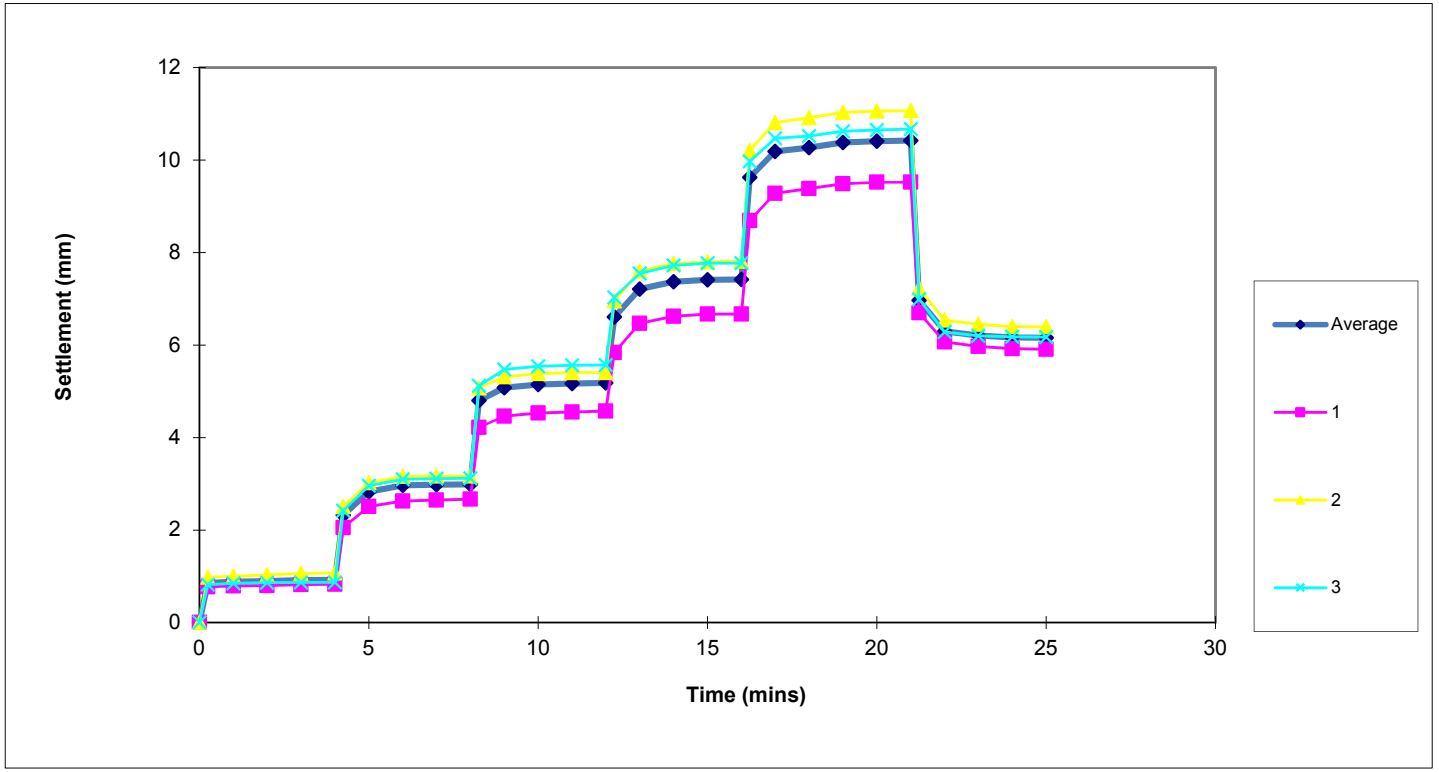
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.77	0.98	0.82	0.86
	1	0.79	1.00	0.85	0.88
	2	0.80	1.03	0.86	0.90
	3	0.82	1.06	0.87	0.92
	4	0.83	1.07	0.87	0.92
50kN/m^2 Load	4.25	2.05	2.50	2.42	2.32
	5	2.51	3.02	2.96	2.83
	6	2.63	3.16	3.10	2.96
	7	2.65	3.17	3.11	2.98
	8	2.67	3.17	3.12	2.99
75kN/m^2 Load	8.25	4.22	5.07	5.12	4.80
	9	4.46	5.31	5.47	5.08
	10	4.53	5.38	5.54	5.15
	11	4.55	5.40	5.56	5.17
	12	4.57	5.40	5.57	5.18
100kN/m^2 Load	12.25	5.84	6.95	7.03	6.61
	13	6.47	7.60	7.55	7.21
	14	6.62	7.76	7.72	7.37
	15	6.67	7.80	7.77	7.41
	16	6.67	7.81	7.77	7.42
125kN/m^2 Load	16.25	8.69	10.21	9.97	9.62
	17	9.28	10.81	10.47	10.19
	18	9.38	10.91	10.52	10.27
	19	9.49	11.03	10.62	10.38
	20	9.52	11.06	10.65	10.41
	21	9.52	11.07	10.67	10.42
0kN/m^2 Unload	21.25	6.70	7.22	6.99	6.97
	22	6.07	6.54	6.28	6.30
	23	5.97	6.45	6.20	6.21
	24	5.92	6.40	6.18	6.17
	25	5.91	6.39	6.17	6.16

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P12



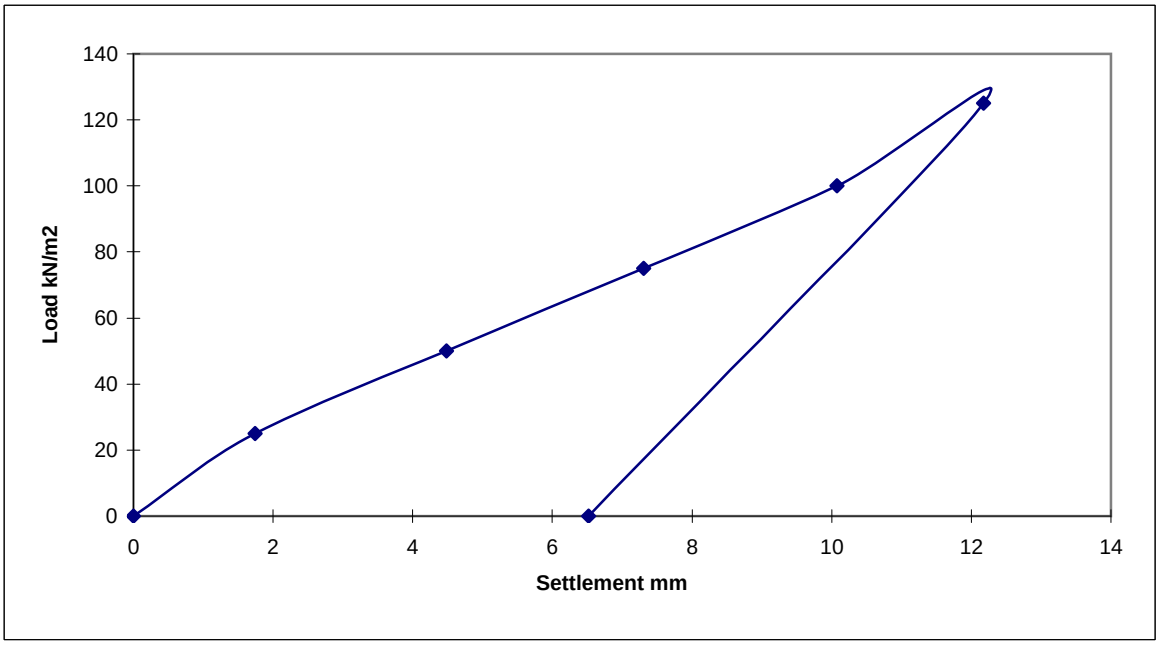
Contract:	Date:
Riverside, Merthyr Vale	09.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P13	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow Sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.74	25	4
4.48	50	8
7.31	75	12
10.08	100	16
12.18	125	20
6.52	0	24



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 13.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

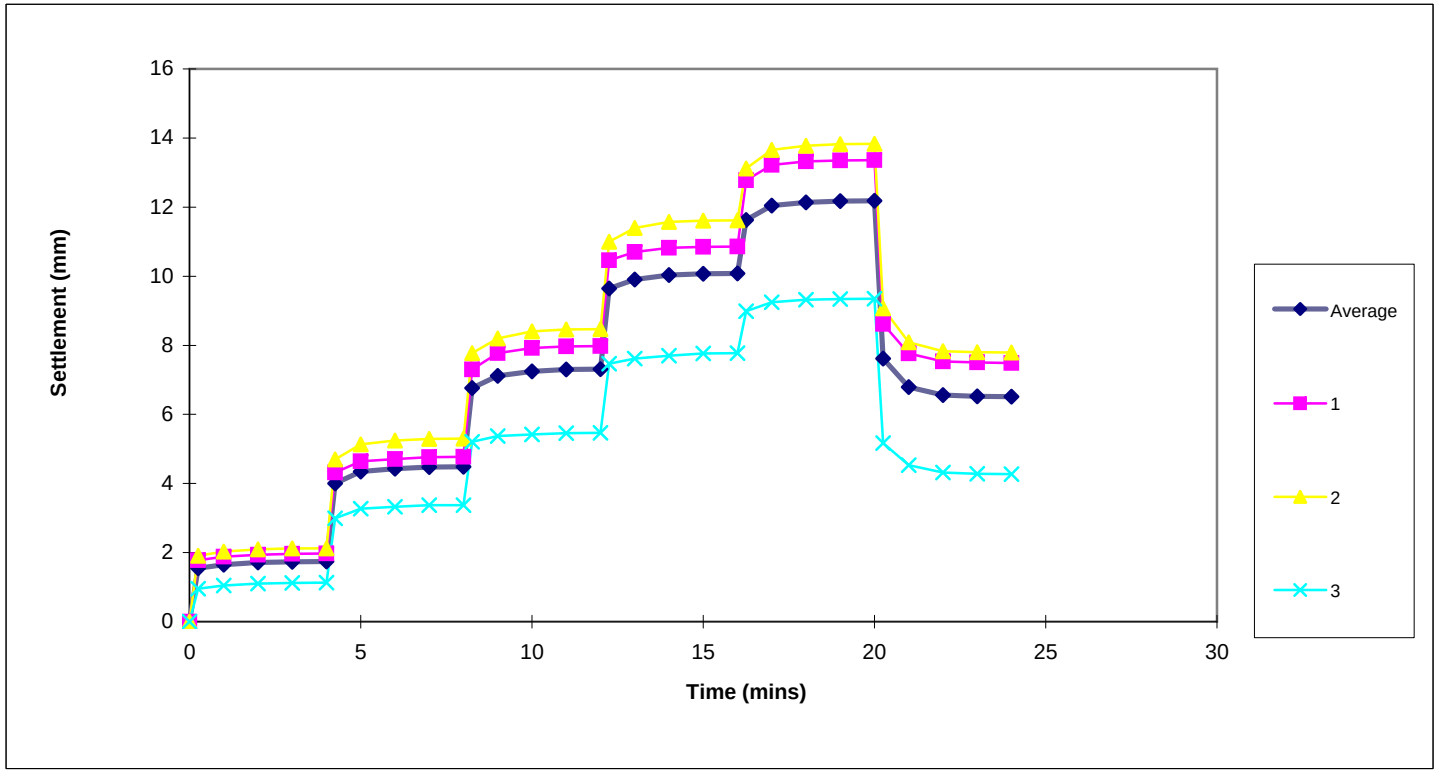
Contract: Riverside, Merthyr Vale | Date: 13.07.18

Test Reference: Test P13 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	1.78	1.91	0.95	1.55
	1	1.88	2.03	1.05	1.65
	2	1.94	2.09	1.10	1.71
	3	1.96	2.12	1.12	1.73
	4	1.97	2.12	1.13	1.74
50kN/m^2 Load	4.25	4.32	4.70	2.99	4.00
	5	4.64	5.13	3.27	4.35
	6	4.71	5.24	3.33	4.43
	7	4.76	5.29	3.37	4.47
	8	4.77	5.30	3.37	4.48
75kN/m^2 Load	8.25	7.30	7.77	5.21	6.76
	9	7.77	8.20	5.37	7.11
	10	7.92	8.40	5.42	7.25
	11	7.97	8.46	5.46	7.30
	12	7.98	8.47	5.47	7.31
100kN/m^2 Load	12.25	10.46	11.00	7.47	9.64
	13	10.70	11.40	7.62	9.91
	14	10.82	11.57	7.70	10.03
	15	10.85	11.61	7.76	10.07
	16	10.86	11.62	7.77	10.08
125kN/m^2 Load	16.25	12.78	13.12	8.99	11.63
	17	13.22	13.66	9.25	12.04
	18	13.32	13.78	9.32	12.14
	19	13.35	13.82	9.34	12.17
	20	13.36	13.83	9.35	12.18
0kN/m^2 Unload	20.25	8.62	9.07	5.17	7.62
	21	7.76	8.09	4.53	6.79
	22	7.53	7.83	4.32	6.56
	23	7.50	7.80	4.28	6.53
	24	7.49	7.79	4.27	6.52

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P13



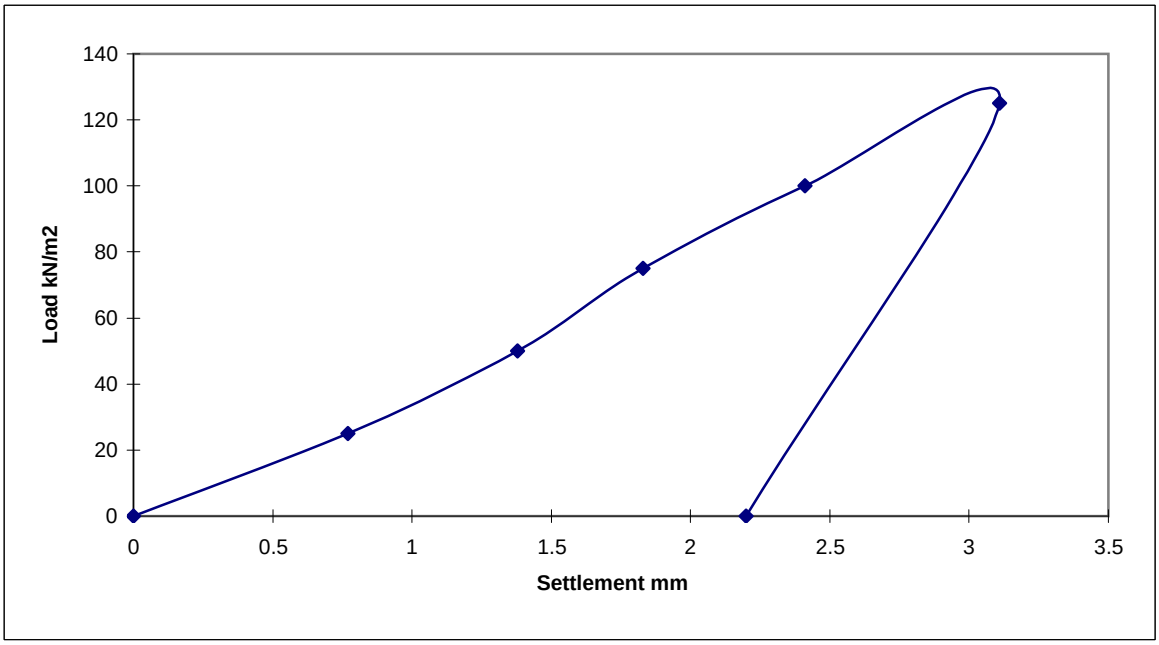
Contract:	Date:
Riverside, Merthyr Vale	13.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P14	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Black grey sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.77	25	4
1.38	50	8
1.83	75	12
2.41	100	16
3.11	125	20
2.20	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 13.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 13.07.18

Test Reference: Test P14

Test Depth: Surface

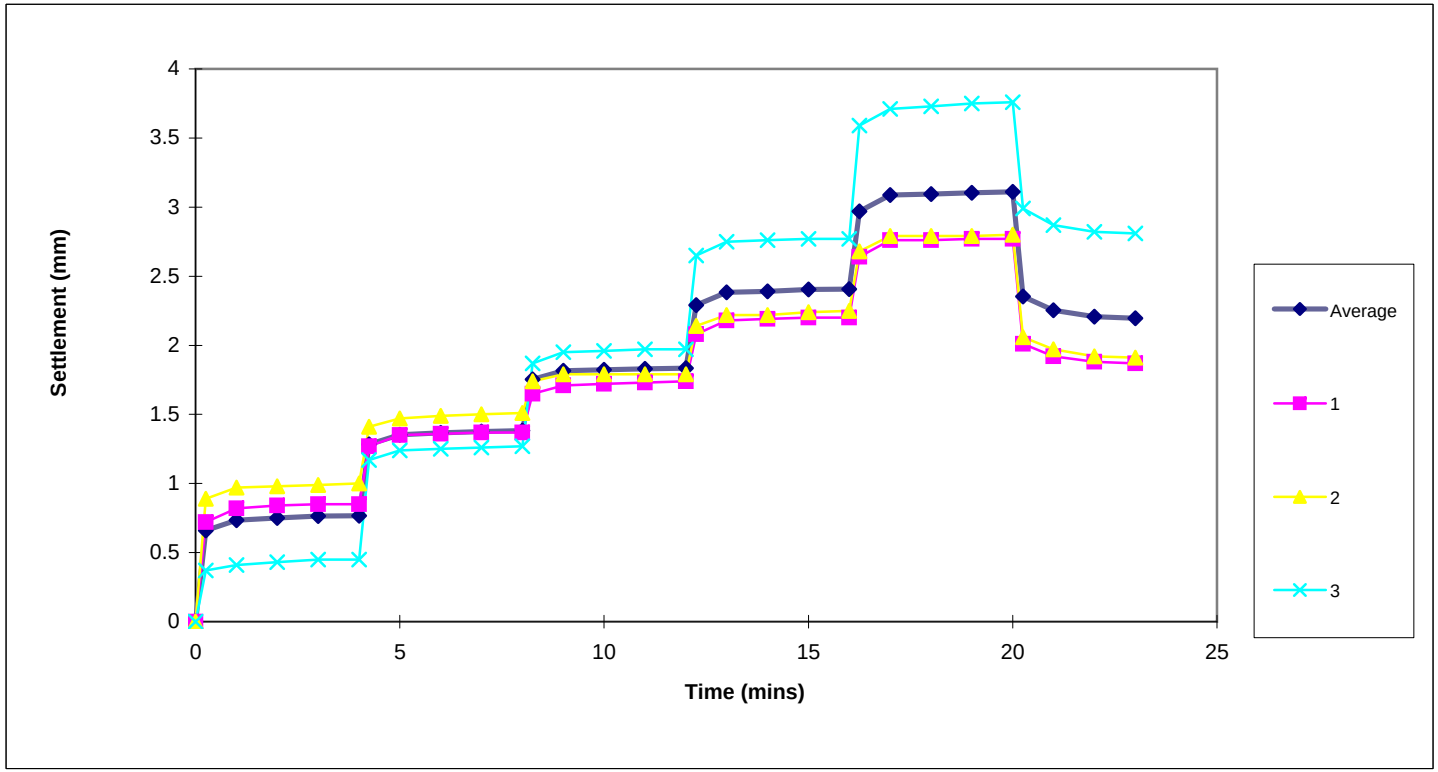
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.72	0.89	0.37	0.66
	1	0.82	0.97	0.41	0.73
	2	0.84	0.98	0.43	0.75
	3	0.85	0.99	0.45	0.76
	4	0.85	1.00	0.45	0.77
50kN/m^2 Load	4.25	1.27	1.41	1.17	1.28
	5	1.35	1.47	1.24	1.35
	6	1.36	1.49	1.25	1.37
	7	1.37	1.50	1.26	1.38
	8	1.37	1.51	1.27	1.38
75kN/m^2 Load	8.25	1.65	1.74	1.87	1.75
	9	1.71	1.79	1.95	1.82
	10	1.72	1.79	1.96	1.82
	11	1.73	1.79	1.97	1.83
	12	1.74	1.79	1.97	1.83
100kN/m^2 Load	12.25	2.08	2.14	2.65	2.29
	13	2.18	2.22	2.75	2.38
	14	2.19	2.22	2.76	2.39
	15	2.20	2.24	2.77	2.40
	16	2.20	2.25	2.77	2.41
125kN/m^2 Load	16.25	2.64	2.68	3.59	2.97
	17	2.76	2.79	3.71	3.09
	18	2.76	2.79	3.73	3.09
	19	2.77	2.79	3.75	3.10
	20	2.77	2.80	3.76	3.11
0kN/m^2 Unload	20.25	2.01	2.06	2.99	2.35
	21	1.92	1.97	2.87	2.25
	22	1.88	1.92	2.82	2.21
	23	1.87	1.91	2.81	2.20

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P14



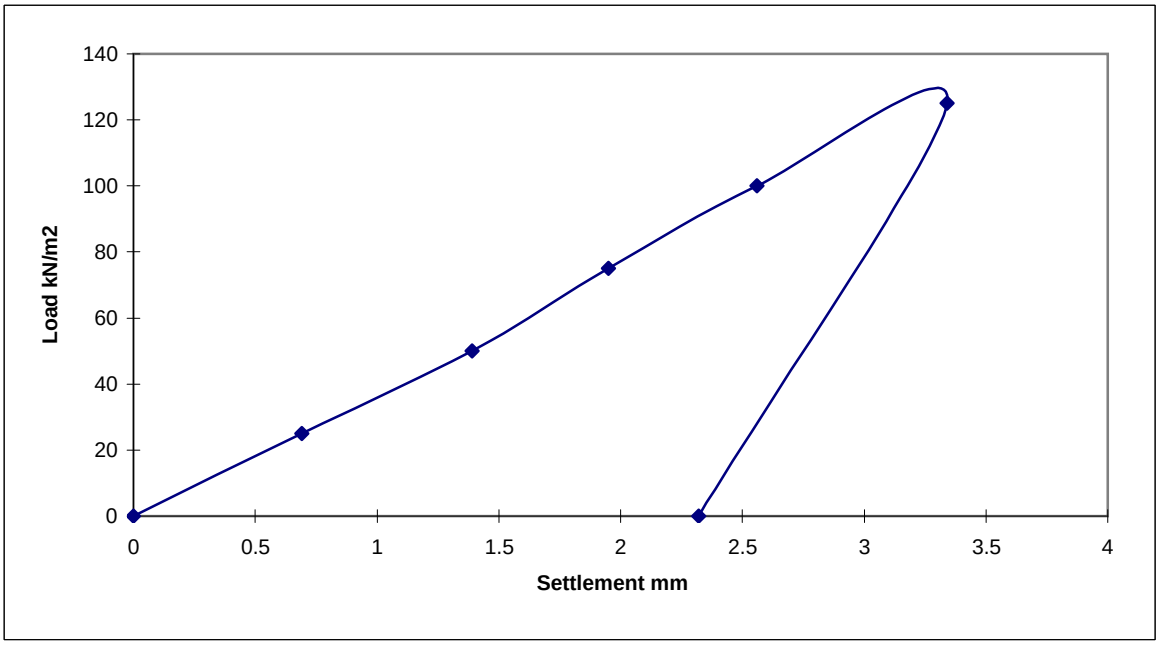
Contract: Riverside, Merthyr Vale	Date: 13.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P15	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Black grey sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.69	25	4
1.39	50	8
1.95	75	12
2.56	100	16
3.34	125	20
2.32	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 13.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 13.07.18

Test Reference: Test P15

Test Depth: Surface

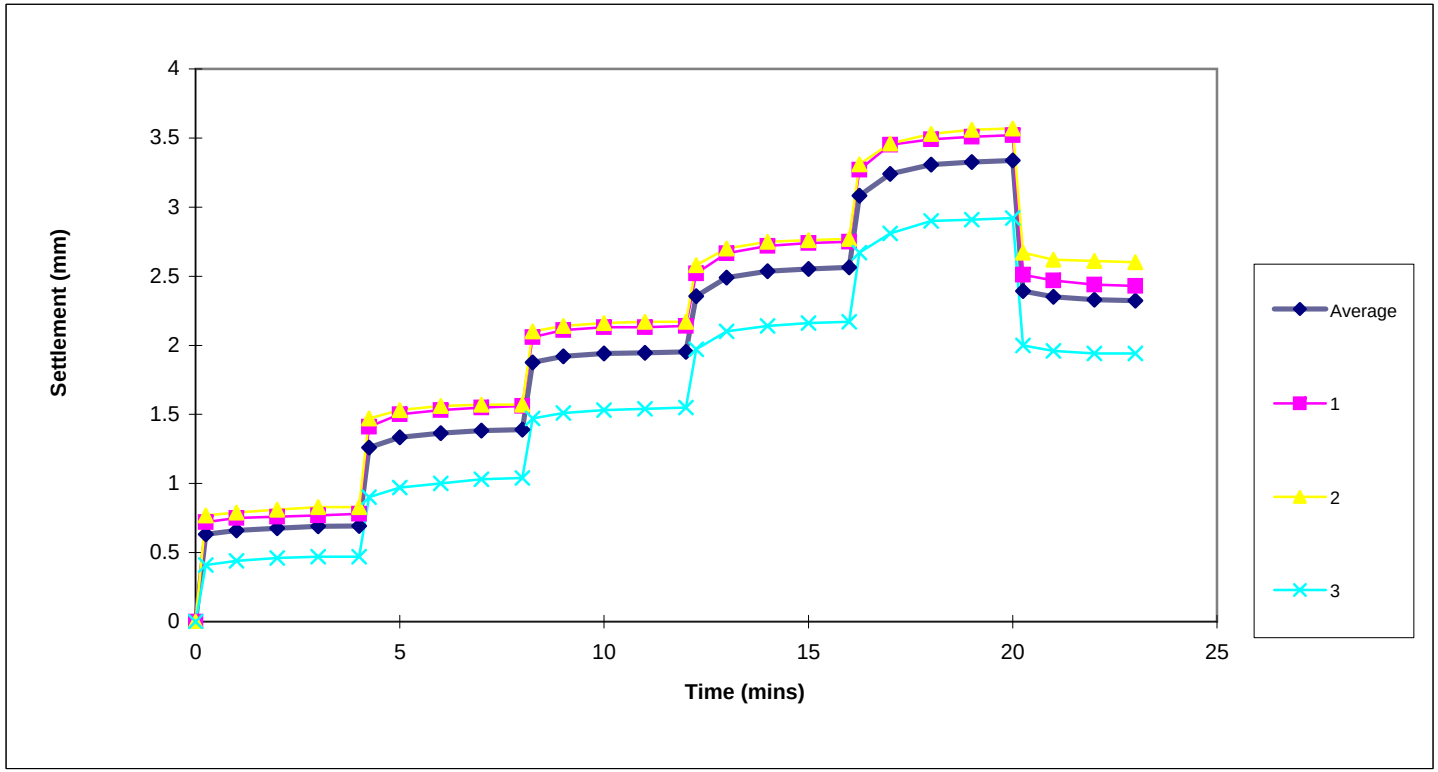
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.72	0.77	0.41	0.63
	1	0.75	0.79	0.44	0.66
	2	0.76	0.81	0.46	0.68
	3	0.77	0.83	0.47	0.69
	4	0.78	0.83	0.47	0.69
50kN/m^2 Load	4.25	1.41	1.47	0.90	1.26
	5	1.50	1.53	0.97	1.33
	6	1.53	1.56	1.00	1.36
	7	1.55	1.57	1.03	1.38
	8	1.56	1.57	1.04	1.39
75kN/m^2 Load	8.25	2.06	2.10	1.47	1.88
	9	2.11	2.14	1.51	1.92
	10	2.13	2.16	1.53	1.94
	11	2.13	2.17	1.54	1.95
	12	2.14	2.17	1.55	1.95
100kN/m^2 Load	12.25	2.52	2.58	1.97	2.36
	13	2.67	2.70	2.10	2.49
	14	2.72	2.75	2.14	2.54
	15	2.74	2.76	2.16	2.55
	16	2.75	2.77	2.17	2.56
125kN/m^2 Load	16.25	3.27	3.31	2.67	3.08
	17	3.45	3.46	2.81	3.24
	18	3.49	3.53	2.90	3.31
	19	3.51	3.56	2.91	3.33
	20	3.52	3.57	2.92	3.34
0kN/m^2 Unload	20.25	2.51	2.67	2.00	2.39
	21	2.47	2.62	1.96	2.35
	22	2.44	2.61	1.94	2.33
	23	2.43	2.60	1.94	2.32

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P15



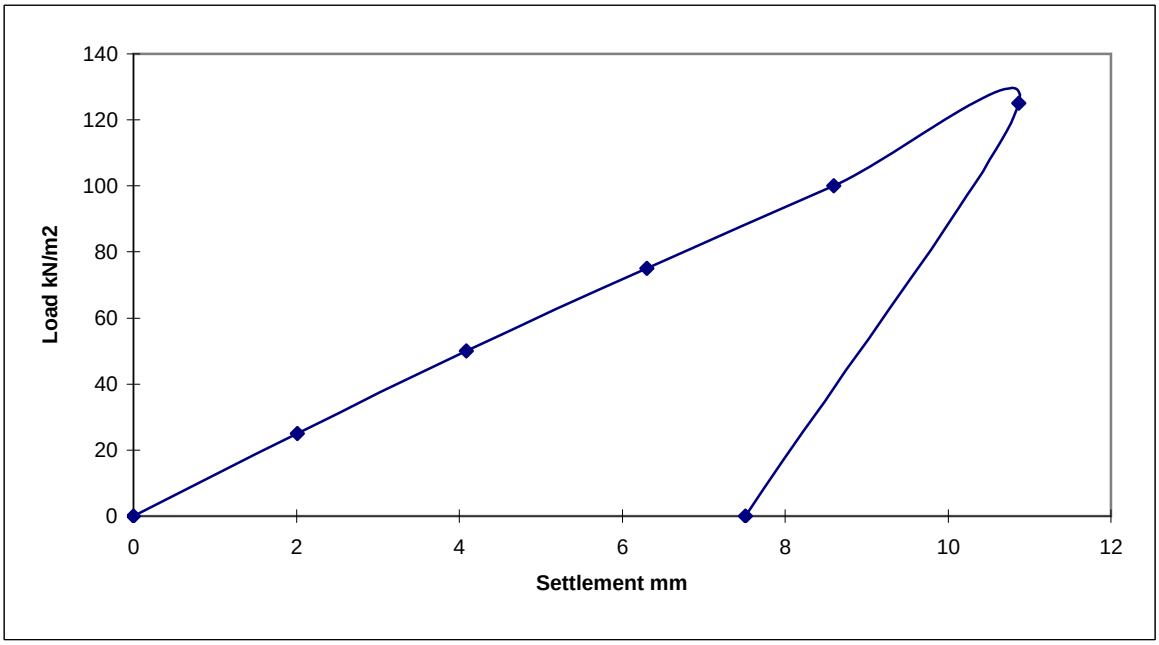
Contract: Riverside, Merthyr Vale	Date: 13.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P16	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Yellow brown sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
2.01	25	4
4.09	50	8
6.30	75	12
8.60	100	16
10.87	125	20
7.51	0	24



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 13.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

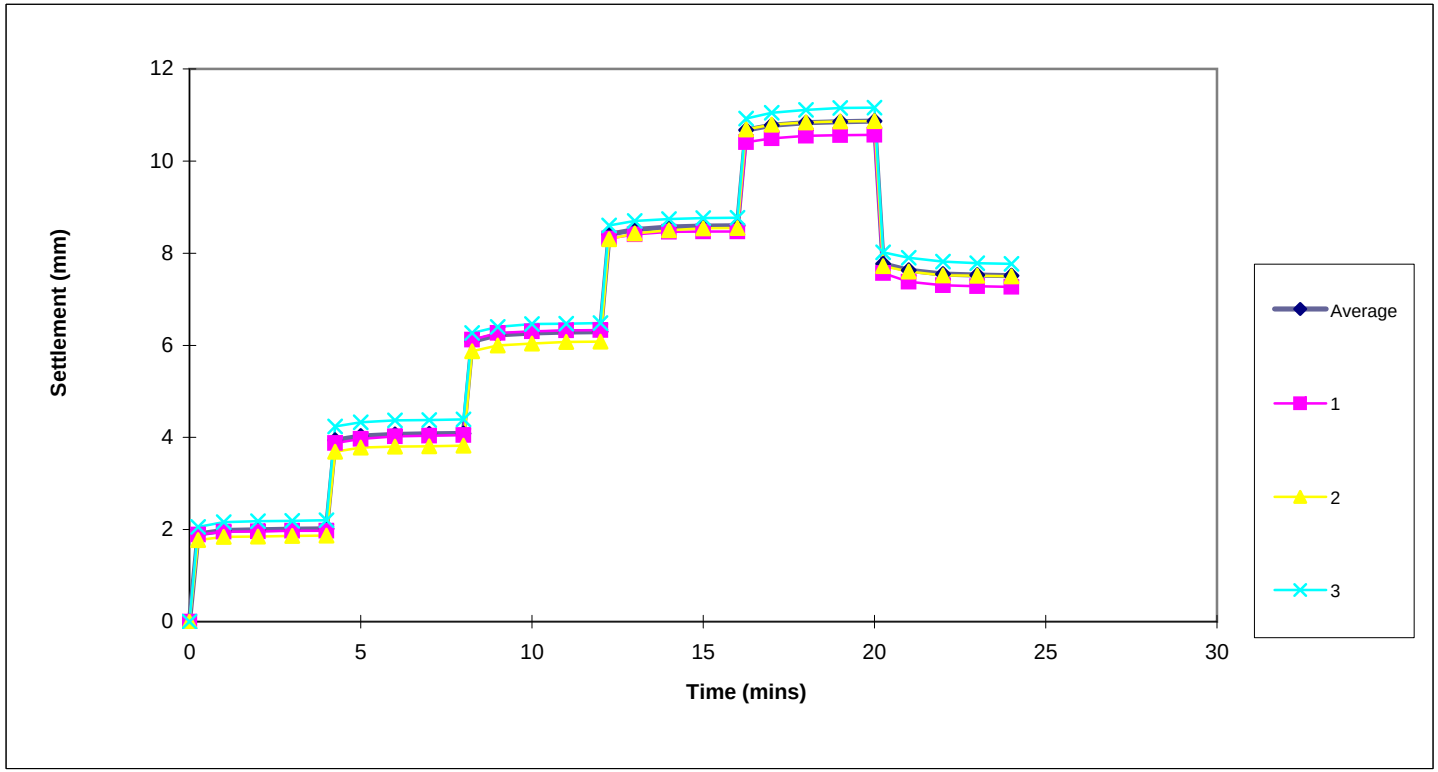
Contract: Riverside, Merthyr Vale | Date: 13.07.18

Test Reference: Test P16 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	1.89	1.77	2.06	1.91
	1	1.95	1.84	2.16	1.98
	2	1.96	1.85	2.18	2.00
	3	1.97	1.86	2.19	2.01
	4	1.97	1.87	2.20	2.01
50kN/m^2 Load	4.25	3.88	3.69	4.24	3.94
	5	3.97	3.78	4.33	4.03
	6	4.02	3.80	4.37	4.06
	7	4.04	3.81	4.38	4.08
	8	4.05	3.82	4.39	4.09
75kN/m^2 Load	8.25	6.12	5.87	6.27	6.09
	9	6.27	6.00	6.40	6.22
	10	6.30	6.04	6.46	6.27
	11	6.32	6.07	6.47	6.29
	12	6.33	6.08	6.48	6.30
100kN/m^2 Load	12.25	8.32	8.30	8.60	8.41
	13	8.41	8.43	8.70	8.51
	14	8.46	8.50	8.74	8.57
	15	8.47	8.54	8.76	8.59
	16	8.47	8.55	8.77	8.60
125kN/m^2 Load	16.25	10.41	10.69	10.92	10.67
	17	10.49	10.79	11.05	10.78
	18	10.55	10.84	11.11	10.83
	19	10.56	10.86	11.15	10.86
	20	10.57	10.87	11.16	10.87
0kN/m^2 Unload	20.25	7.57	7.72	8.02	7.77
	21	7.38	7.60	7.90	7.63
	22	7.30	7.52	7.82	7.55
	23	7.28	7.51	7.78	7.52
	24	7.27	7.50	7.77	7.51

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P16



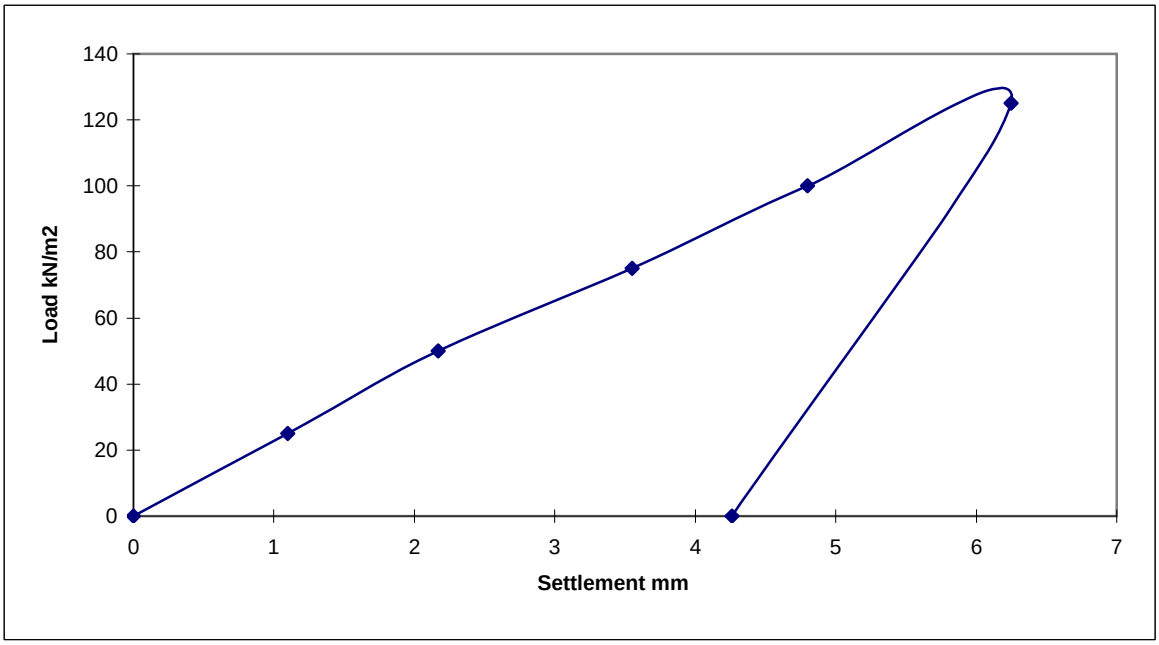
Contract:	Date:
Riverside, Merthyr Vale	13.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P17	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Black grey sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.10	25	4
2.17	50	8
3.55	75	12
4.80	100	16
6.25	125	20
4.26	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 13.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 13.07.18

Test Reference: Test P17

Test Depth: Surface

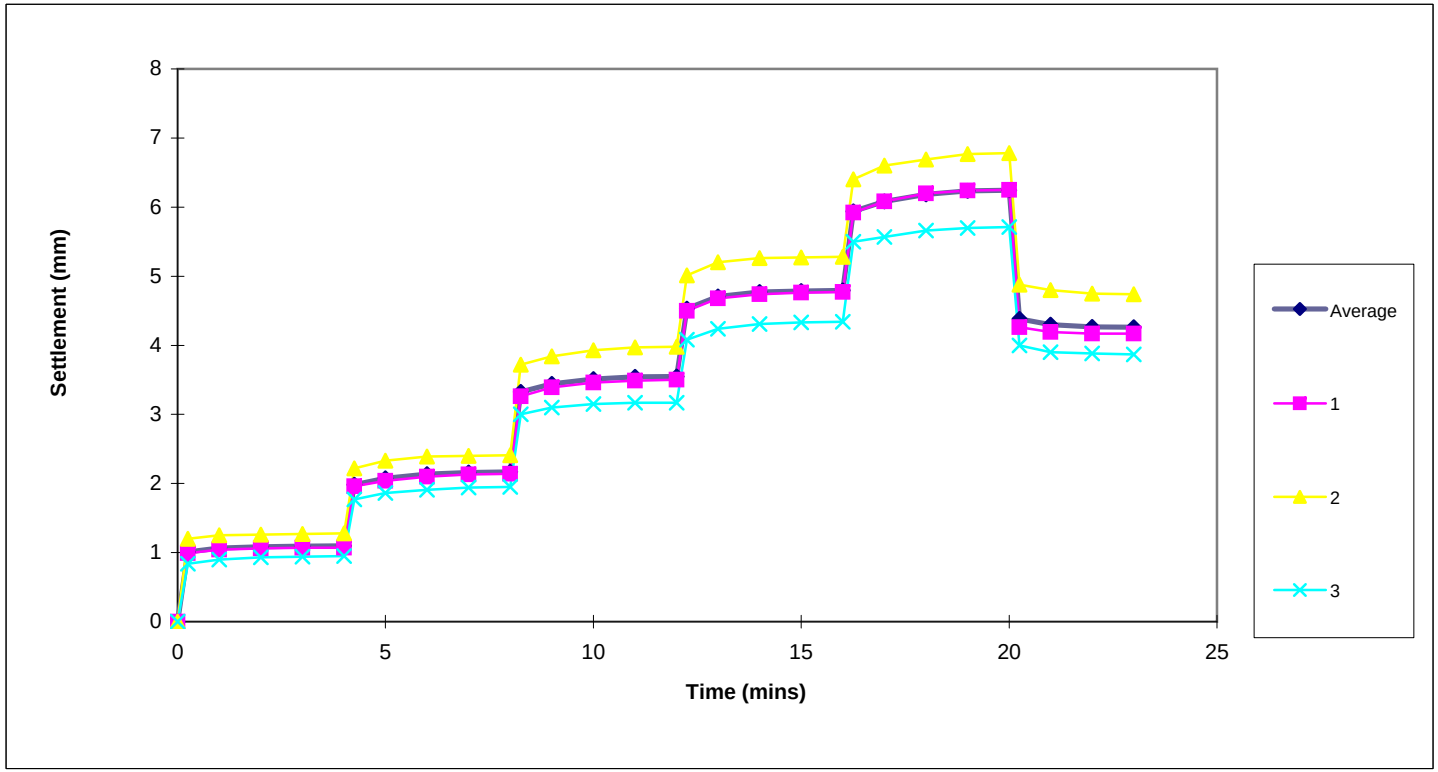
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.99	1.20	0.84	1.01
	1	1.04	1.25	0.90	1.06
	2	1.06	1.26	0.93	1.08
	3	1.07	1.27	0.94	1.09
	4	1.07	1.28	0.95	1.10
50kN/m^2 Load	4.25	1.96	2.22	1.77	1.98
	5	2.04	2.33	1.86	2.08
	6	2.10	2.39	1.91	2.13
	7	2.13	2.40	1.94	2.16
	8	2.14	2.41	1.95	2.17
75kN/m^2 Load	8.25	3.26	3.72	3.00	3.33
	9	3.39	3.84	3.10	3.44
	10	3.46	3.93	3.15	3.51
	11	3.49	3.97	3.17	3.54
	12	3.50	3.98	3.17	3.55
100kN/m^2 Load	12.25	4.50	5.01	4.08	4.53
	13	4.68	5.20	4.24	4.71
	14	4.74	5.26	4.31	4.77
	15	4.76	5.27	4.33	4.79
	16	4.77	5.28	4.34	4.80
125kN/m^2 Load	16.25	5.92	6.40	5.50	5.94
	17	6.08	6.60	5.57	6.08
	18	6.20	6.69	5.66	6.18
	19	6.24	6.77	5.70	6.24
	20	6.25	6.78	5.71	6.25
0kN/m^2 Unload	20.25	4.26	4.88	4.00	4.38
	21	4.19	4.80	3.90	4.30
	22	4.17	4.75	3.88	4.27
	23	4.17	4.74	3.87	4.26

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P17



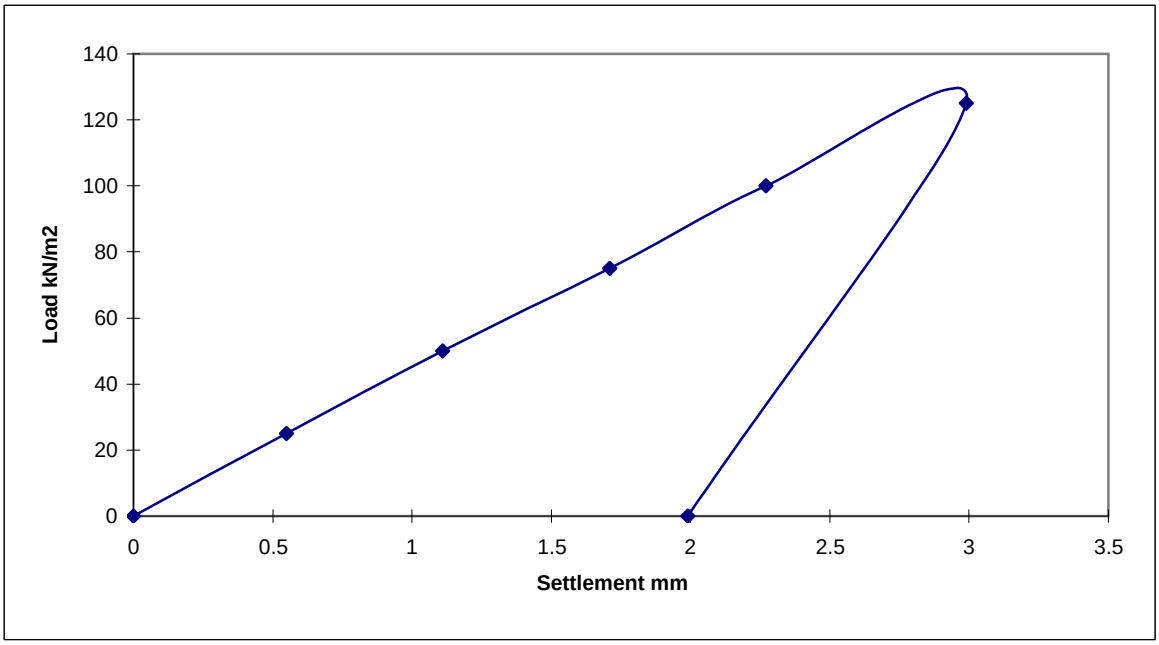
Contract:	Date:
Riverside, Merthyr Vale	13.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P18	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Black grey sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.55	25	4
1.11	50	8
1.71	75	12
2.27	100	16
2.99	125	20
1.99	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 13.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 13.07.18

Test Reference: Test P18

Test Depth: Surface

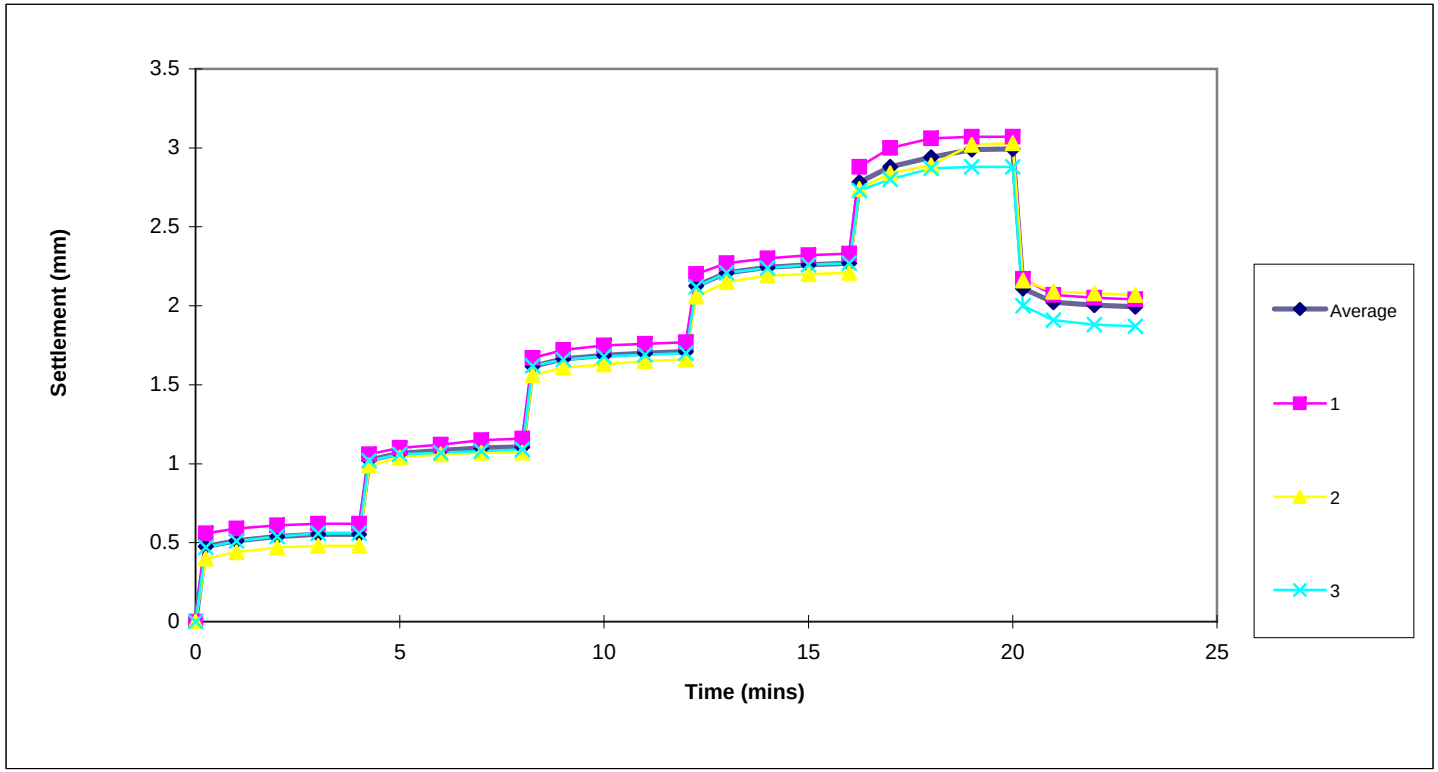
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.56	0.40	0.47	0.48
	1	0.59	0.44	0.51	0.51
	2	0.61	0.47	0.54	0.54
	3	0.62	0.48	0.56	0.55
	4	0.62	0.48	0.56	0.55
50kN/m^2 Load	4.25	1.06	0.99	1.02	1.02
	5	1.10	1.04	1.06	1.07
	6	1.12	1.06	1.07	1.08
	7	1.15	1.07	1.08	1.10
	8	1.16	1.07	1.09	1.11
75kN/m^2 Load	8.25	1.67	1.56	1.62	1.62
	9	1.72	1.61	1.66	1.66
	10	1.75	1.63	1.68	1.69
	11	1.76	1.65	1.69	1.70
	12	1.77	1.66	1.70	1.71
100kN/m^2 Load	12.25	2.20	2.06	2.12	2.13
	13	2.27	2.15	2.21	2.21
	14	2.30	2.19	2.24	2.24
	15	2.32	2.20	2.26	2.26
	16	2.33	2.21	2.27	2.27
125kN/m^2 Load	16.25	2.88	2.74	2.73	2.78
	17	3.00	2.84	2.80	2.88
	18	3.06	2.89	2.87	2.94
	19	3.07	3.02	2.88	2.99
	20	3.07	3.03	2.88	2.99
0kN/m^2 Unload	20.25	2.17	2.16	2.00	2.11
	21	2.07	2.09	1.91	2.02
	22	2.05	2.08	1.88	2.00
	23	2.04	2.07	1.87	1.99

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P18



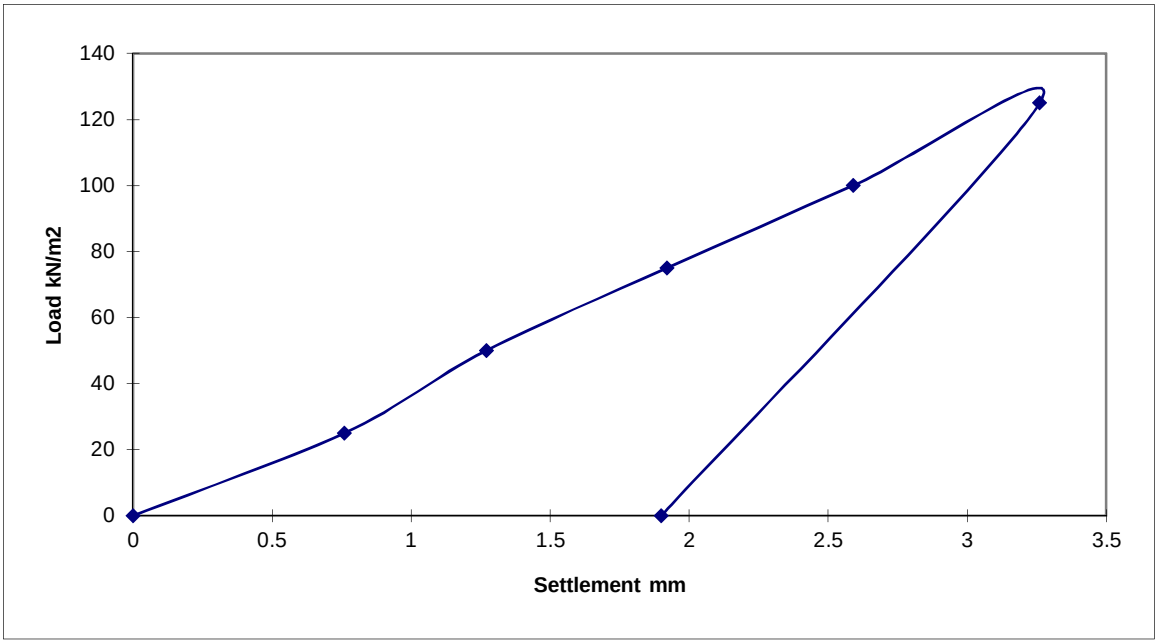
Contract:	Date:
Riverside, Merthyr Vale	13.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Test P19	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Black grey sandy CLAY

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.76	25	4
1.27	50	8
1.92	75	12
2.59	100	16
3.26	125	20
1.90	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Riverside, Merthyr Vale	Date: 13.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Riverside, Merthyr Vale

Date: 13.07.18

Test Reference: Test P19

Test Depth: Surface

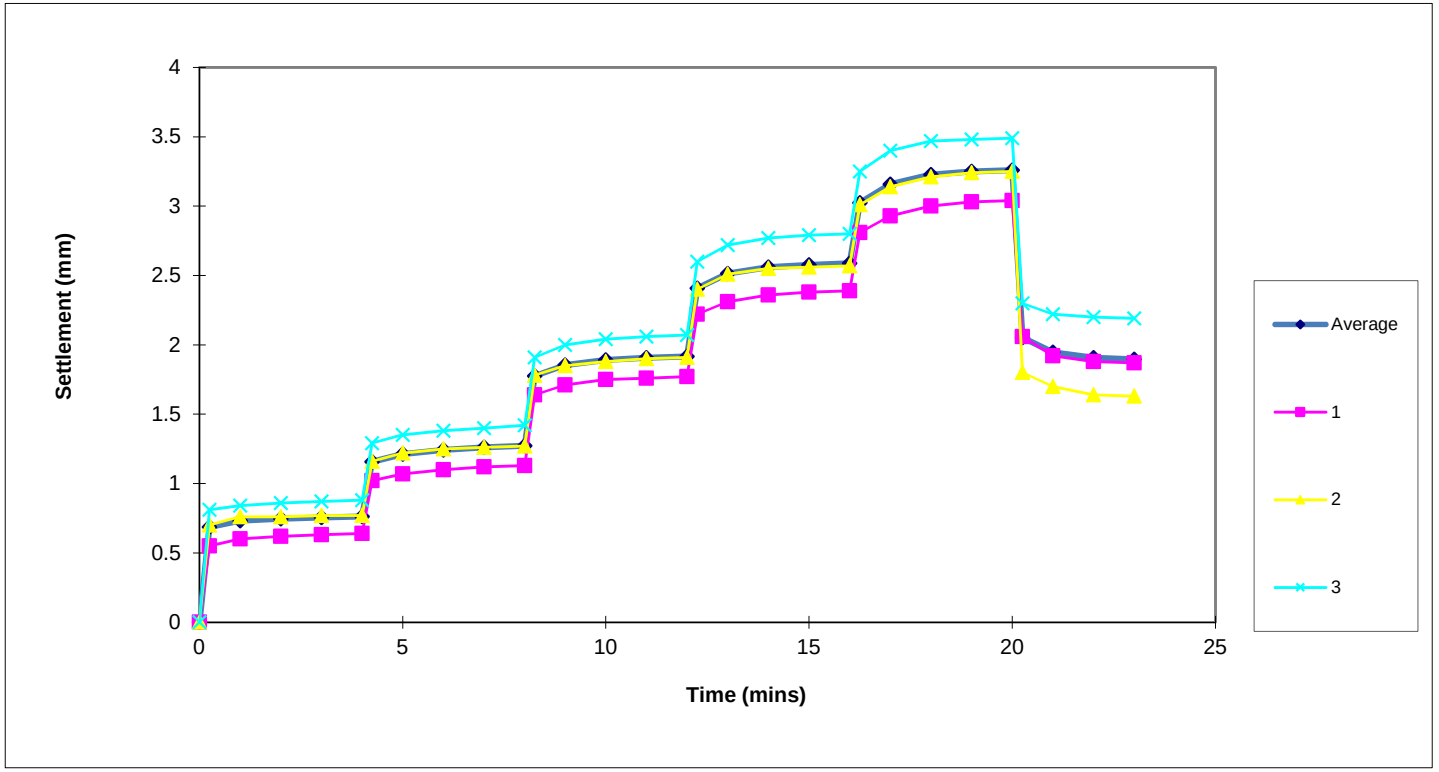
Plate Diameter: 600mm

Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.55	0.70	0.81	0.69
	1	0.60	0.76	0.84	0.73
	2	0.62	0.76	0.86	0.75
	3	0.63	0.77	0.87	0.76
	4	0.64	0.77	0.88	0.76
50kN/m^2 Load	4.25	1.02	1.16	1.29	1.16
	5	1.07	1.22	1.35	1.21
	6	1.10	1.25	1.38	1.24
	7	1.12	1.26	1.40	1.26
	8	1.13	1.27	1.42	1.27
75kN/m^2 Load	8.25	1.64	1.78	1.91	1.78
	9	1.71	1.85	2.00	1.85
	10	1.75	1.88	2.04	1.89
	11	1.76	1.90	2.06	1.91
	12	1.77	1.91	2.07	1.92
100kN/m^2 Load	12.25	2.22	2.40	2.60	2.41
	13	2.31	2.51	2.72	2.51
	14	2.36	2.55	2.77	2.56
	15	2.38	2.56	2.79	2.58
	16	2.39	2.57	2.80	2.59
125kN/m^2 Load	16.25	2.81	3.01	3.25	3.02
	17	2.93	3.14	3.40	3.16
	18	3.00	3.21	3.47	3.23
	19	3.03	3.24	3.48	3.25
	20	3.04	3.25	3.49	3.26
0kN/m^2 Unload	20.25	2.06	1.80	2.30	2.05
	21	1.92	1.70	2.22	1.95
	22	1.88	1.64	2.20	1.91
	23	1.87	1.63	2.19	1.90

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Test P19



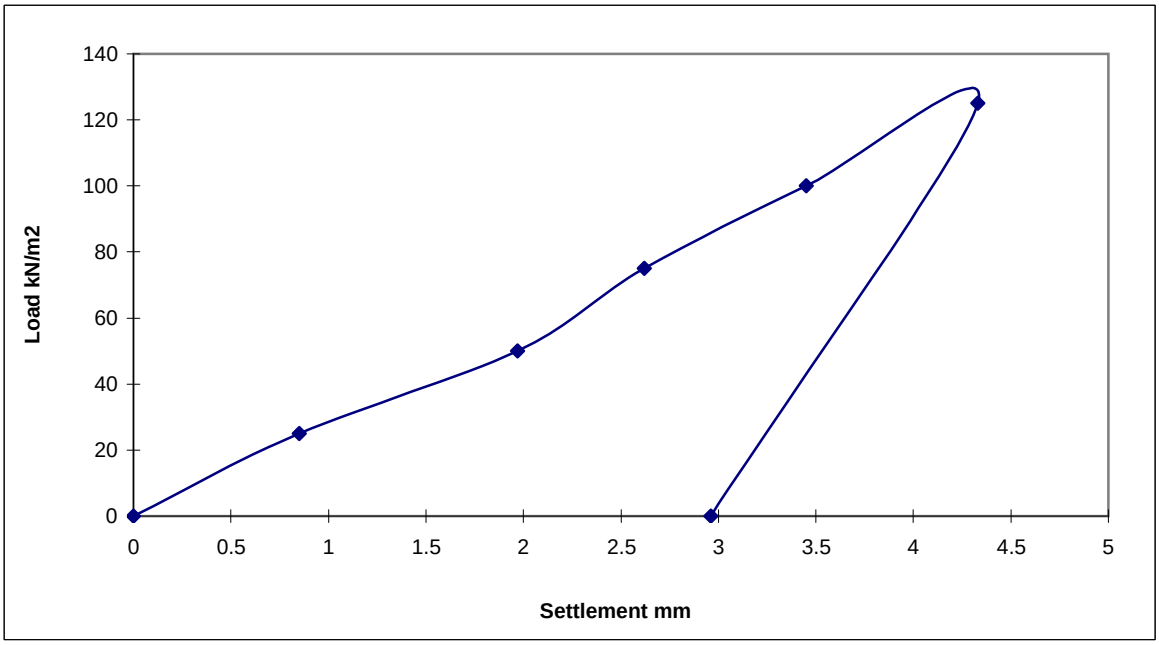
Contract: Riverside, Merthyr Vale	Date: 13.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P20	Surface	600mm	Red/brown clay.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.85	25	4
1.97	50	8
2.62	75	12
3.45	100	16
4.33	125	20
2.96	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 27.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

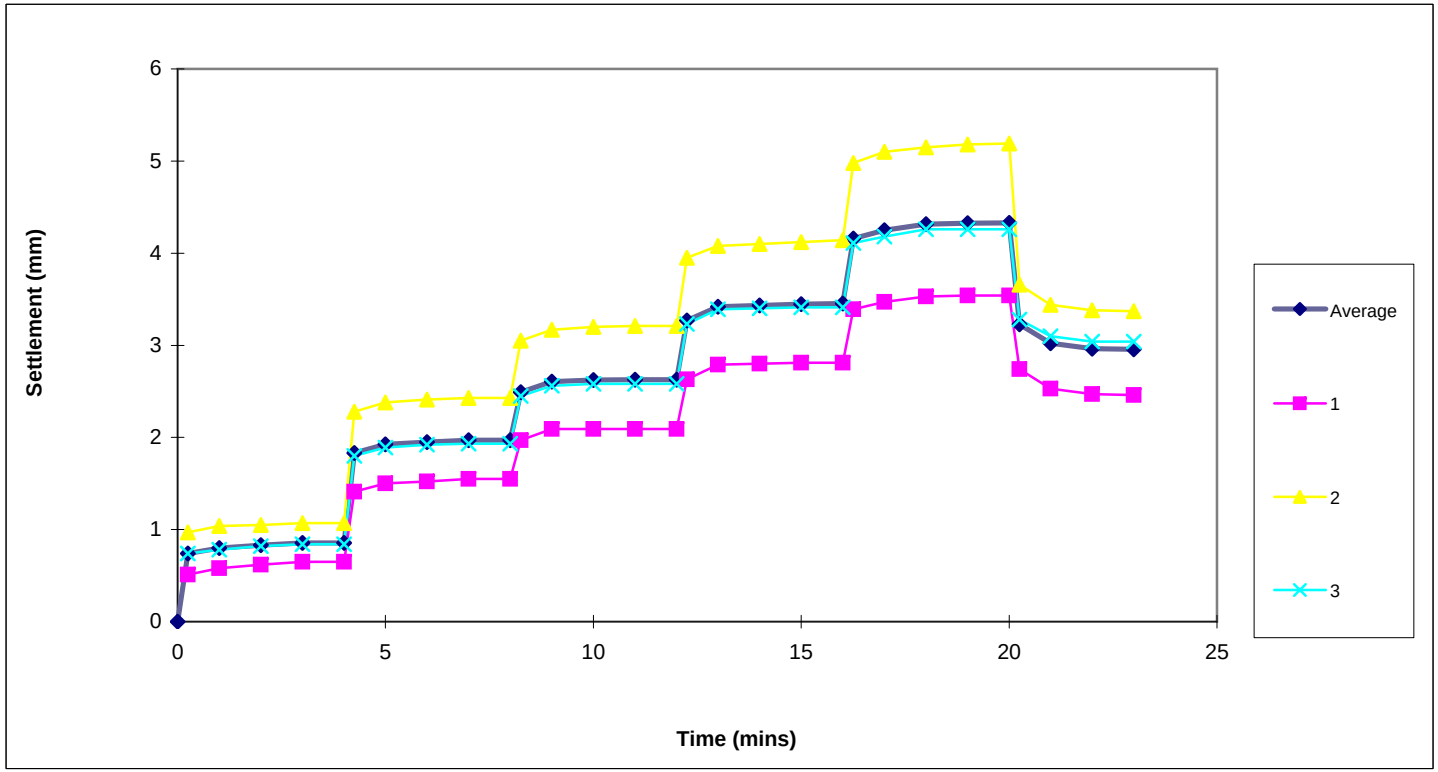
Contract: Merthyr Vale | Date: 27.07.18

Test Reference: P20 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.51	0.97	0.74	0.74
	1	0.58	1.04	0.78	0.80
	2	0.62	1.05	0.82	0.83
	3	0.65	1.07	0.84	0.85
	4	0.65	1.07	0.84	0.85
50kN/m^2 Load	4.25	1.41	2.28	1.80	1.83
	5	1.50	2.38	1.89	1.92
	6	1.52	2.41	1.92	1.95
	7	1.55	2.43	1.93	1.97
	8	1.55	2.43	1.93	1.97
75kN/m^2 Load	8.25	1.97	3.05	2.45	2.49
	9	2.09	3.17	2.56	2.61
	10	2.09	3.20	2.58	2.62
	11	2.09	3.21	2.58	2.63
	12	2.09	3.21	2.58	2.63
100kN/m^2 Load	12.25	2.63	3.95	3.23	3.27
	13	2.79	4.08	3.39	3.42
	14	2.80	4.10	3.40	3.43
	15	2.81	4.12	3.41	3.45
	16	2.81	4.14	3.41	3.45
125kN/m^2 Load	16.25	3.39	4.98	4.11	4.16
	17	3.47	5.10	4.18	4.25
	18	3.53	5.15	4.26	4.31
	19	3.54	5.18	4.26	4.33
	20	3.54	5.19	4.26	4.33
0kN/m^2 Unload	20.25	2.74	3.66	3.28	3.23
	21	2.53	3.44	3.10	3.02
	22	2.47	3.38	3.04	2.96
	23	2.46	3.37	3.04	2.96

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P20



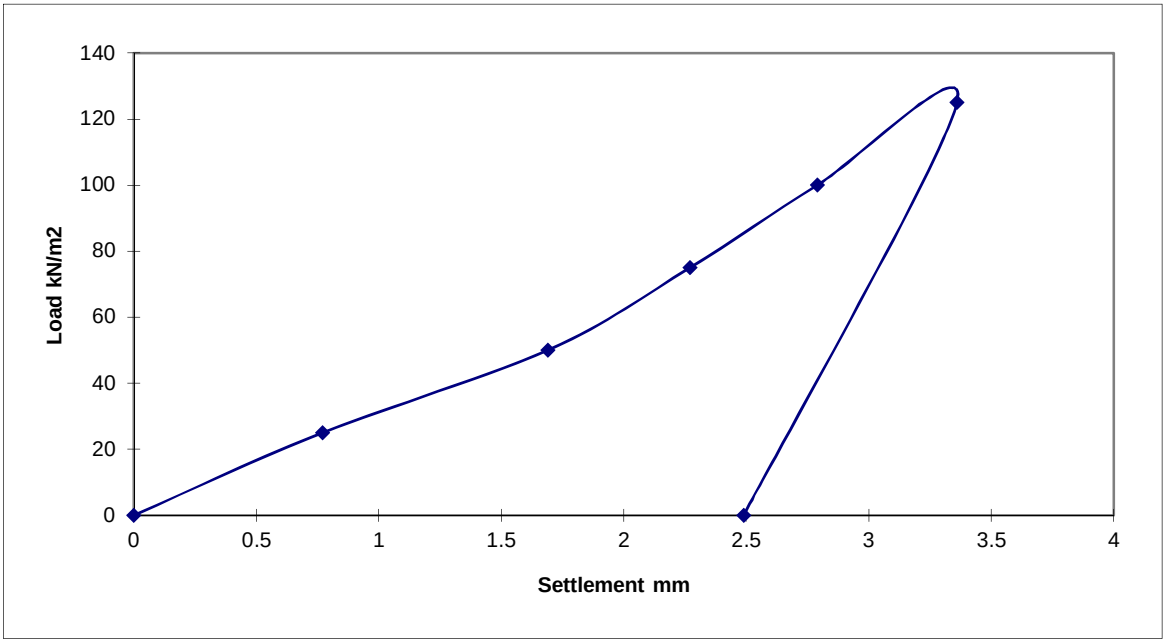
Contract: Merthyr Vale	Date: 27.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: P21	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Black grey sandy Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.77	25	4
1.69	50	8
2.27	75	12
2.79	100	16
3.36	125	20
2.49	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 20.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

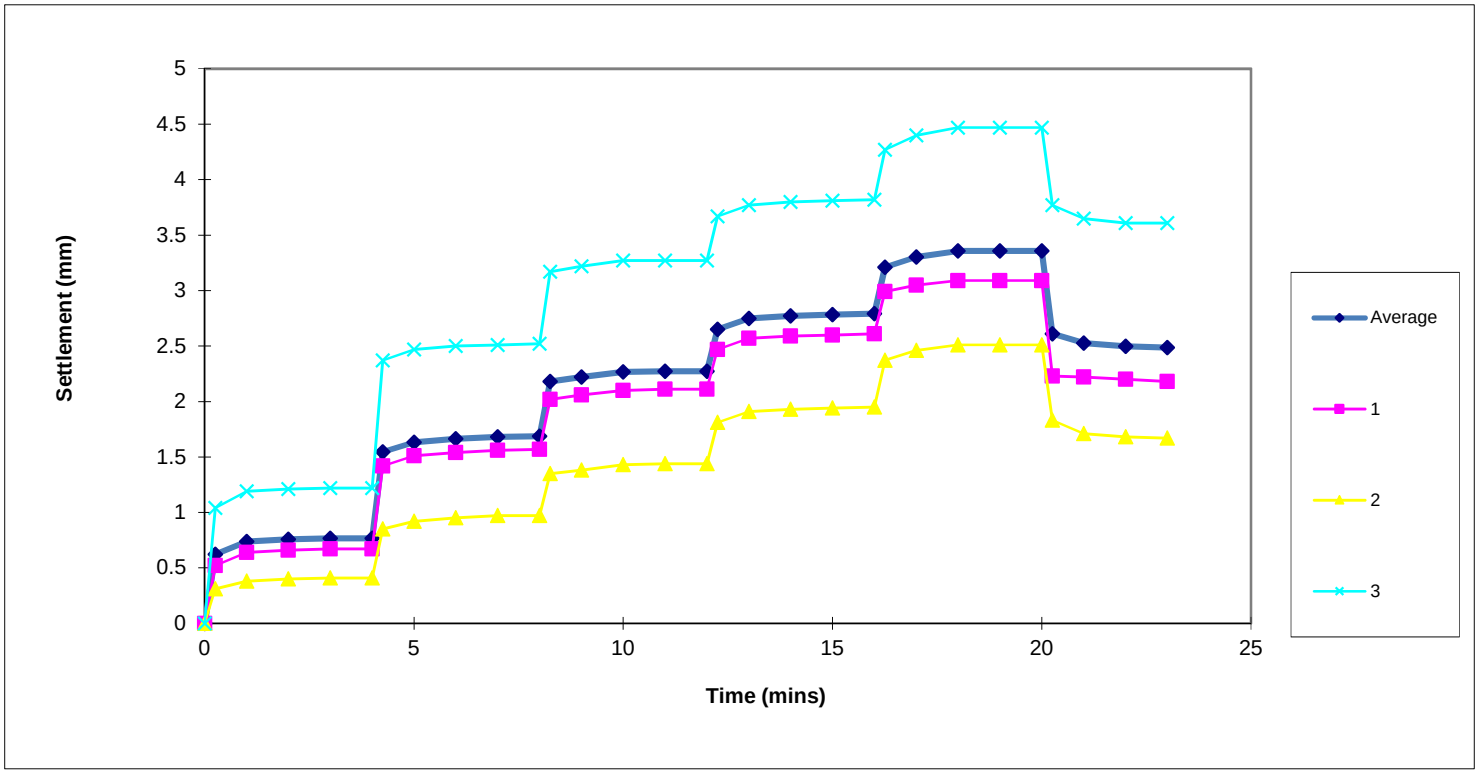
Contract: Merthyr Vale | Date: 20.07.18

Test Reference: P21 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.52	0.31	1.04	0.62
	1	0.64	0.38	1.19	0.74
	2	0.66	0.40	1.21	0.76
	3	0.67	0.41	1.22	0.77
	4	0.67	0.41	1.22	0.77
50kN/m^2 Load	4.25	1.42	0.85	2.37	1.55
	5	1.51	0.92	2.47	1.63
	6	1.54	0.95	2.50	1.66
	7	1.56	0.97	2.51	1.68
	8	1.57	0.97	2.52	1.69
75kN/m^2 Load	8.25	2.02	1.35	3.17	2.18
	9	2.06	1.38	3.22	2.22
	10	2.10	1.43	3.27	2.27
	11	2.11	1.44	3.27	2.27
	12	2.11	1.44	3.27	2.27
100kN/m^2 Load	12.25	2.47	1.81	3.67	2.65
	13	2.57	1.91	3.77	2.75
	14	2.59	1.93	3.80	2.77
	15	2.60	1.94	3.81	2.78
	16	2.61	1.95	3.82	2.79
125kN/m^2 Load	16.25	2.99	2.37	4.27	3.21
	17	3.05	2.46	4.40	3.30
	18	3.09	2.51	4.47	3.36
	19	3.09	2.51	4.47	3.36
	20	3.09	2.51	4.47	3.36
0kN/m^2 Unload	20.25	2.23	1.83	3.77	2.61
	21	2.22	1.71	3.65	2.53
	22	2.20	1.68	3.61	2.50
	23	2.18	1.67	3.61	2.49

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Plate 21



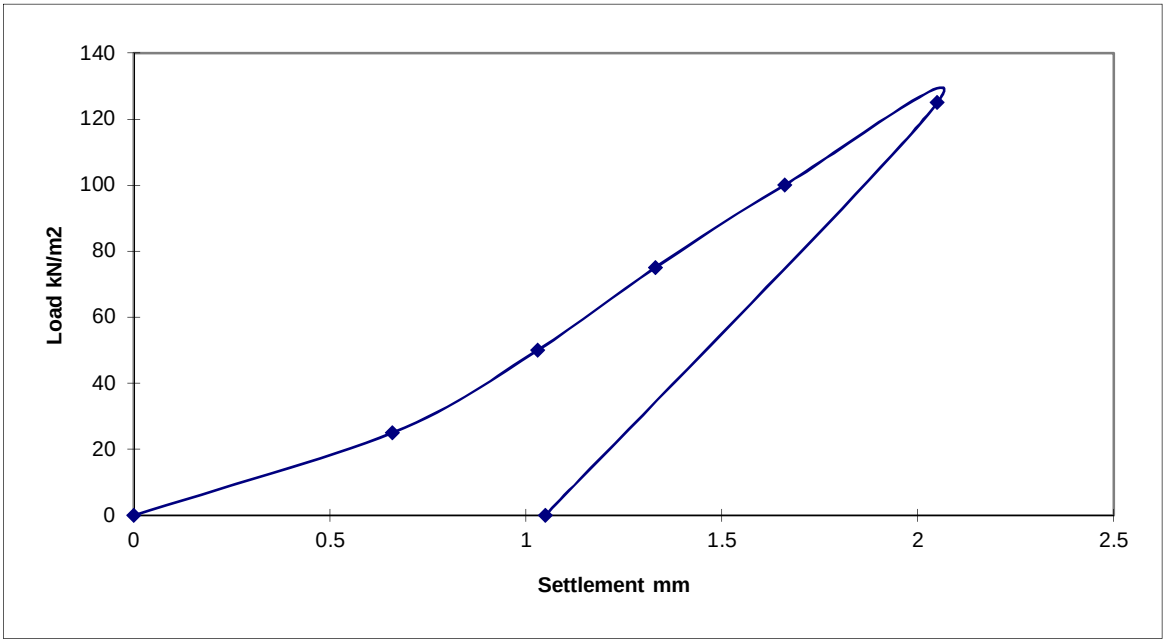
Contract: Merthyr Vale	Date: 20.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: P22	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Black grey sandy Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.66	25	4
1.03	50	8
1.33	75	12
1.66	100	16
2.05	125	20
1.05	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale

Date: 20.07.18
Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

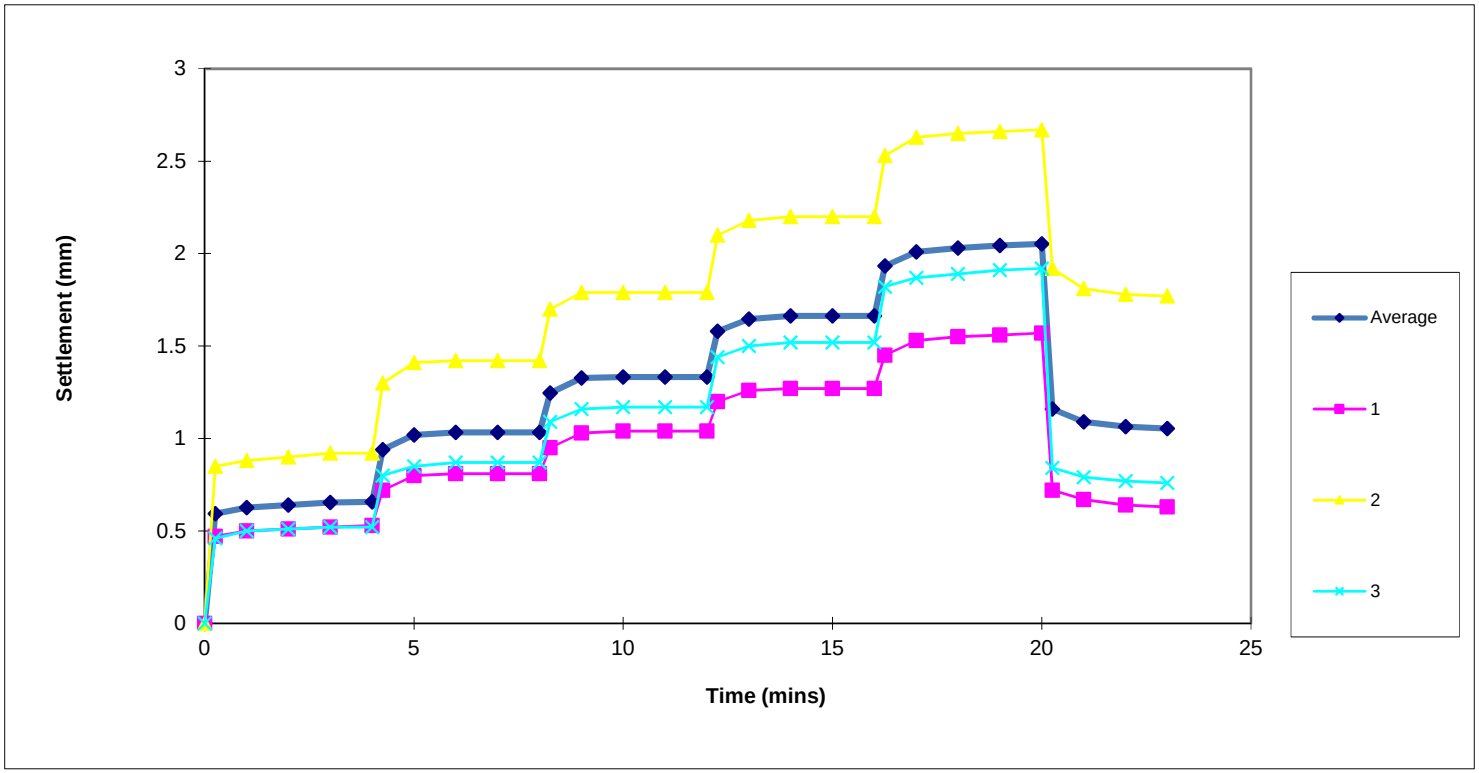
Contract: Merthyr Vale | Date: 20.07.18

Test Reference: P22 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.47	0.85	0.46	0.59
	1	0.50	0.88	0.50	0.63
	2	0.51	0.90	0.51	0.64
	3	0.52	0.92	0.52	0.65
	4	0.53	0.92	0.52	0.66
50kN/m^2 Load	4.25	0.72	1.30	0.80	0.94
	5	0.80	1.41	0.85	1.02
	6	0.81	1.42	0.87	1.03
	7	0.81	1.42	0.87	1.03
	8	0.81	1.42	0.87	1.03
75kN/m^2 Load	8.25	0.95	1.70	1.09	1.25
	9	1.03	1.79	1.16	1.33
	10	1.04	1.79	1.17	1.33
	11	1.04	1.79	1.17	1.33
	12	1.04	1.79	1.17	1.33
100kN/m^2 Load	12.25	1.20	2.10	1.44	1.58
	13	1.26	2.18	1.50	1.65
	14	1.27	2.20	1.52	1.66
	15	1.27	2.20	1.52	1.66
	16	1.27	2.20	1.52	1.66
125kN/m^2 Load	16.25	1.45	2.53	1.82	1.93
	17	1.53	2.63	1.87	2.01
	18	1.55	2.65	1.89	2.03
	19	1.56	2.66	1.91	2.04
	20	1.57	2.67	1.92	2.05
0kN/m^2 Unload	20.25	0.72	1.92	0.84	1.16
	21	0.67	1.81	0.79	1.09
	22	0.64	1.78	0.77	1.06
	23	0.63	1.77	0.76	1.05

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P22



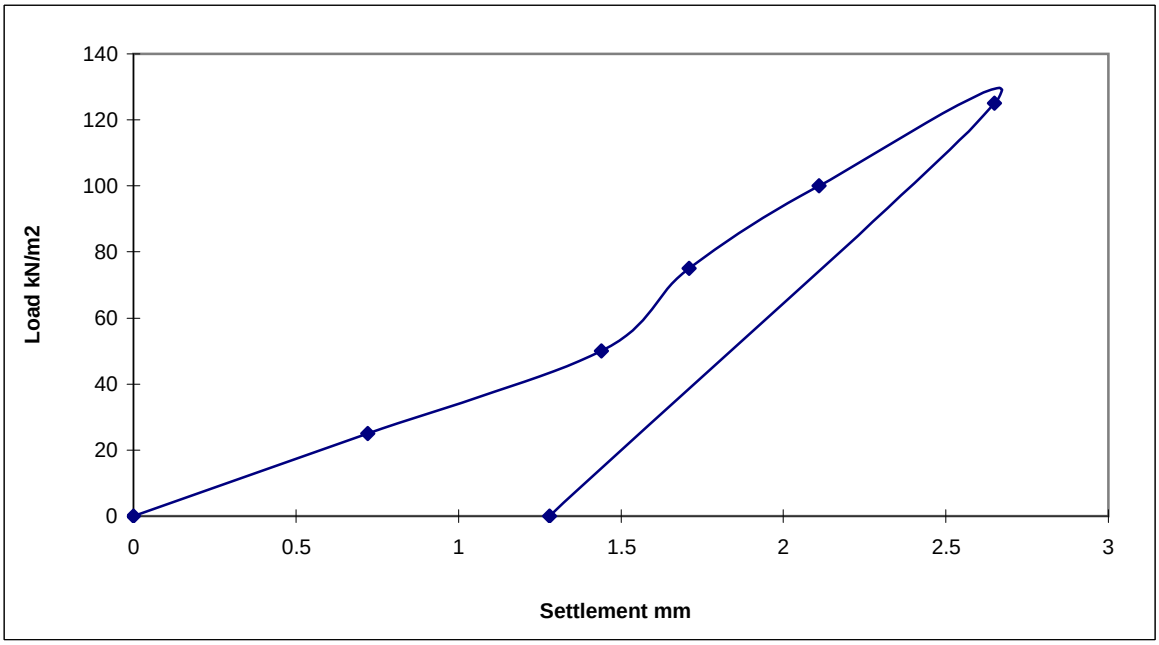
Contract: Merthyr Vale	Date: 20.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P23	Surface	600mm	Red/brown clay.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.72	25	4
1.44	50	8
1.71	75	12
2.11	100	16
2.65	125	20
1.28	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 27.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

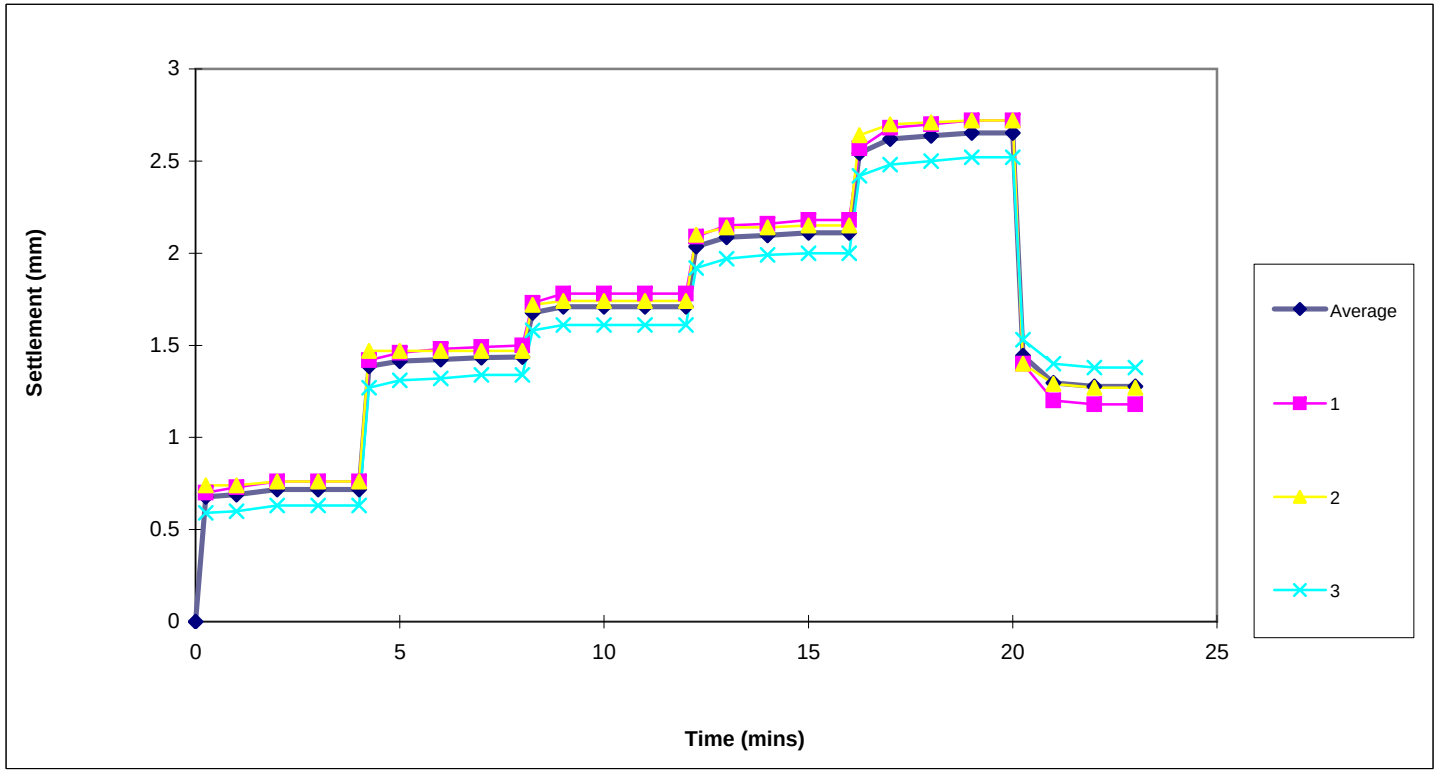
Contract: Merthyr Vale | Date: 27.07.18

Test Reference: P23 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2	0				0
Load	0.25	0.70	0.74	0.59	0.68
	1	0.73	0.74	0.60	0.69
	2	0.76	0.76	0.63	0.72
	3	0.76	0.76	0.63	0.72
	4	0.76	0.76	0.63	0.72
50kN/m^2	4.25	1.42	1.47	1.27	1.39
Load	5	1.46	1.47	1.31	1.41
	6	1.48	1.47	1.32	1.42
	7	1.49	1.47	1.34	1.43
	8	1.50	1.47	1.34	1.44
75kN/m^2	8.25	1.73	1.72	1.58	1.68
Load	9	1.78	1.74	1.61	1.71
	10	1.78	1.74	1.61	1.71
	11	1.78	1.74	1.61	1.71
	12	1.78	1.74	1.61	1.71
100kN/m^2	12.25	2.09	2.10	1.92	2.04
Load	13	2.15	2.14	1.97	2.09
	14	2.16	2.14	1.99	2.10
	15	2.18	2.15	2.00	2.11
	16	2.18	2.15	2.00	2.11
125kN/m^2	16.25	2.57	2.64	2.42	2.54
Load	17	2.68	2.70	2.48	2.62
	18	2.70	2.71	2.50	2.64
	19	2.72	2.72	2.52	2.65
	20	2.72	2.72	2.52	2.65
0kN/m^2	20.25	1.40	1.40	1.53	1.44
Unload	21	1.20	1.29	1.40	1.30
	22	1.18	1.27	1.38	1.28
	23	1.18	1.27	1.38	1.28

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P23



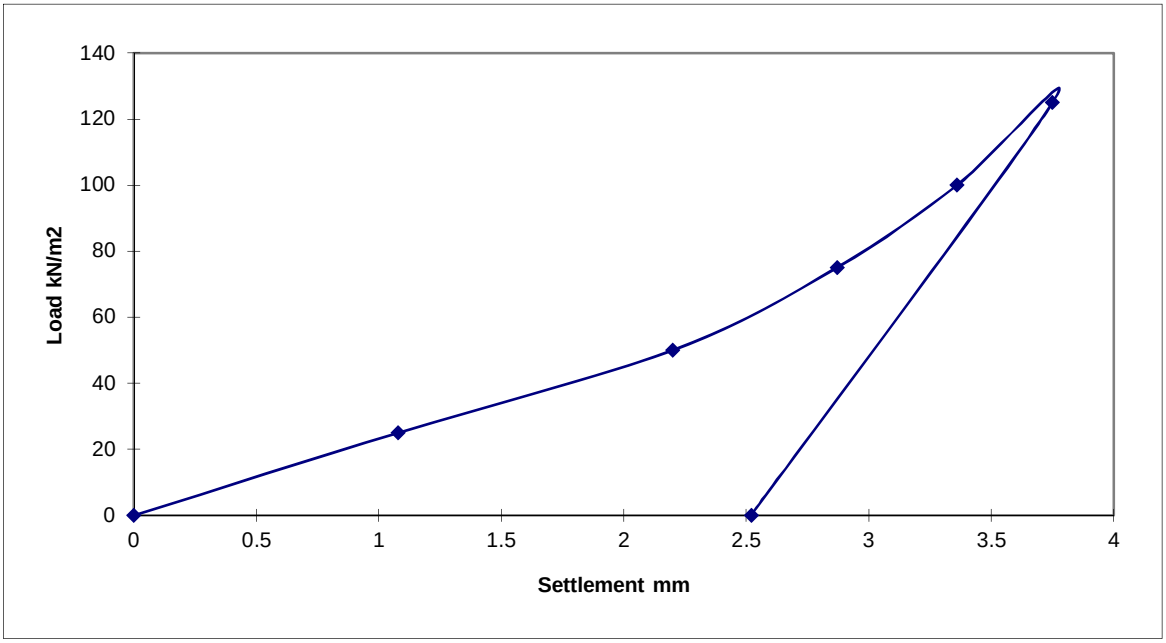
Contract: Merthyr Vale	Date: 27.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: P24	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Black grey sandy Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.08	25	4
2.20	50	8
2.87	75	12
3.36	100	16
3.75	125	20
2.52	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 20.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

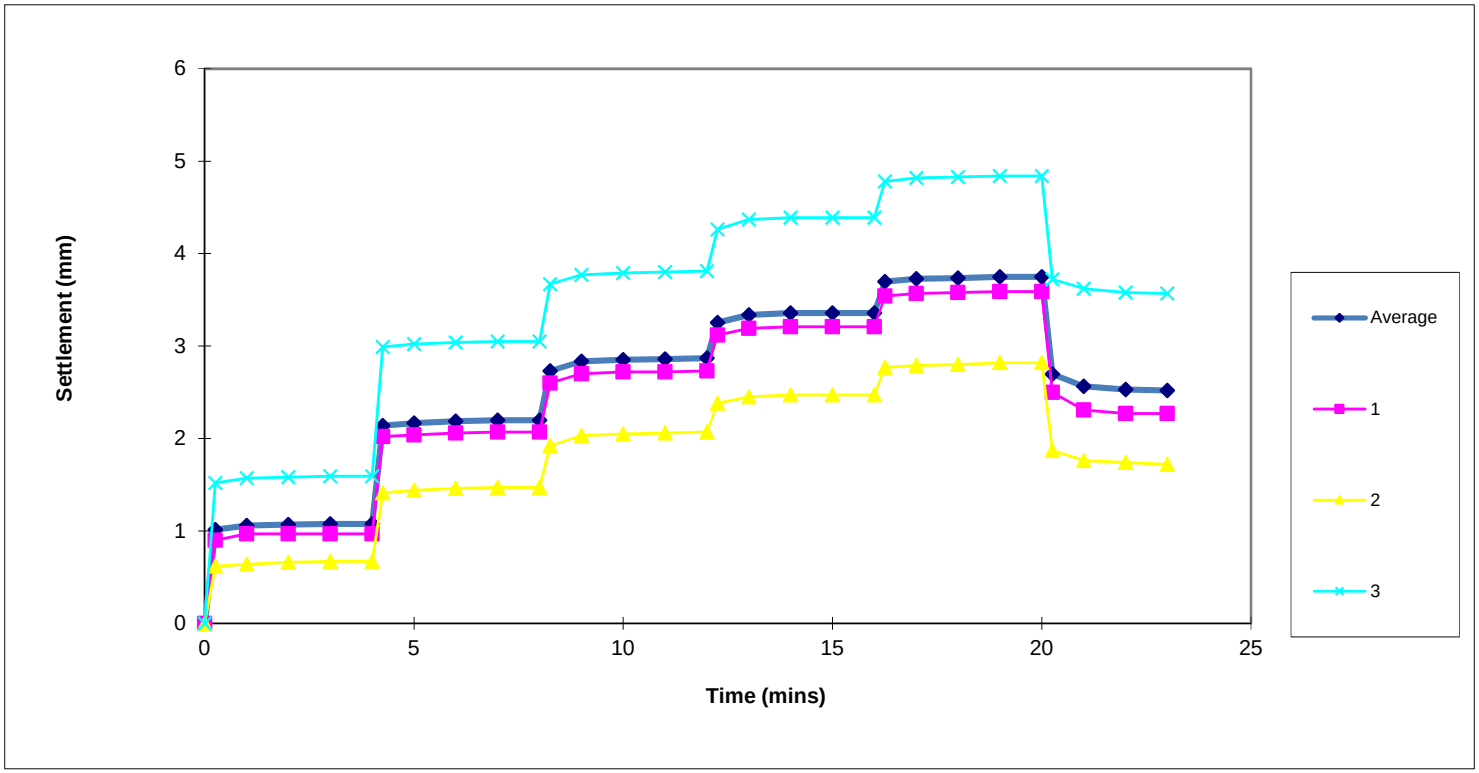
Contract: Merthyr Vale | Date: 20.07.18

Test Reference: P24 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.90	0.62	1.52	1.01
	1	0.97	0.64	1.57	1.06
	2	0.97	0.66	1.58	1.07
	3	0.97	0.67	1.59	1.08
	4	0.97	0.67	1.59	1.08
50kN/m^2 Load	4.25	2.02	1.41	2.99	2.14
	5	2.04	1.44	3.02	2.17
	6	2.06	1.46	3.04	2.19
	7	2.07	1.47	3.05	2.20
	8	2.07	1.47	3.05	2.20
75kN/m^2 Load	8.25	2.60	1.92	3.67	2.73
	9	2.70	2.03	3.77	2.83
	10	2.72	2.05	3.79	2.85
	11	2.72	2.06	3.80	2.86
	12	2.73	2.07	3.81	2.87
100kN/m^2 Load	12.25	3.12	2.38	4.26	3.25
	13	3.19	2.45	4.37	3.34
	14	3.21	2.47	4.39	3.36
	15	3.21	2.47	4.39	3.36
	16	3.21	2.47	4.39	3.36
125kN/m^2 Load	16.25	3.54	2.77	4.78	3.70
	17	3.57	2.79	4.82	3.73
	18	3.58	2.80	4.83	3.74
	19	3.59	2.82	4.84	3.75
	20	3.59	2.82	4.84	3.75
0kN/m^2 Unload	20.25	2.50	1.87	3.72	2.70
	21	2.31	1.76	3.62	2.56
	22	2.27	1.74	3.58	2.53
	23	2.27	1.72	3.57	2.52

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P24



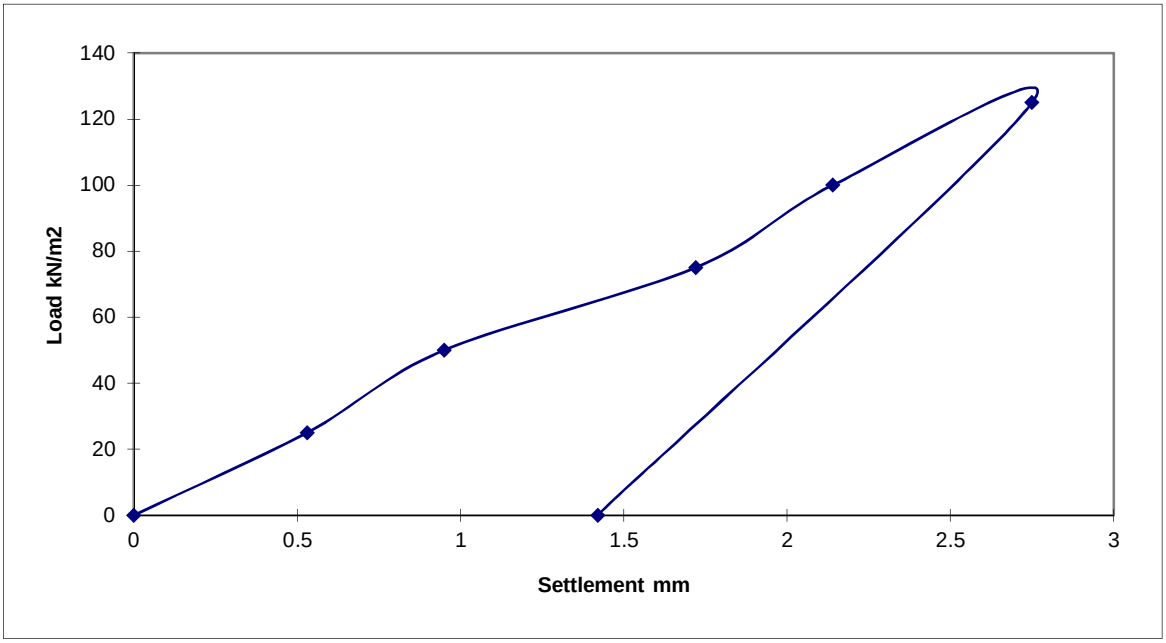
Contract: Merthyr Vale	Date: 20.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 25	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Black grey sandy Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.53	25	4
0.95	50	8
1.72	75	12
2.14	100	16
2.75	125	20
1.42	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 20.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

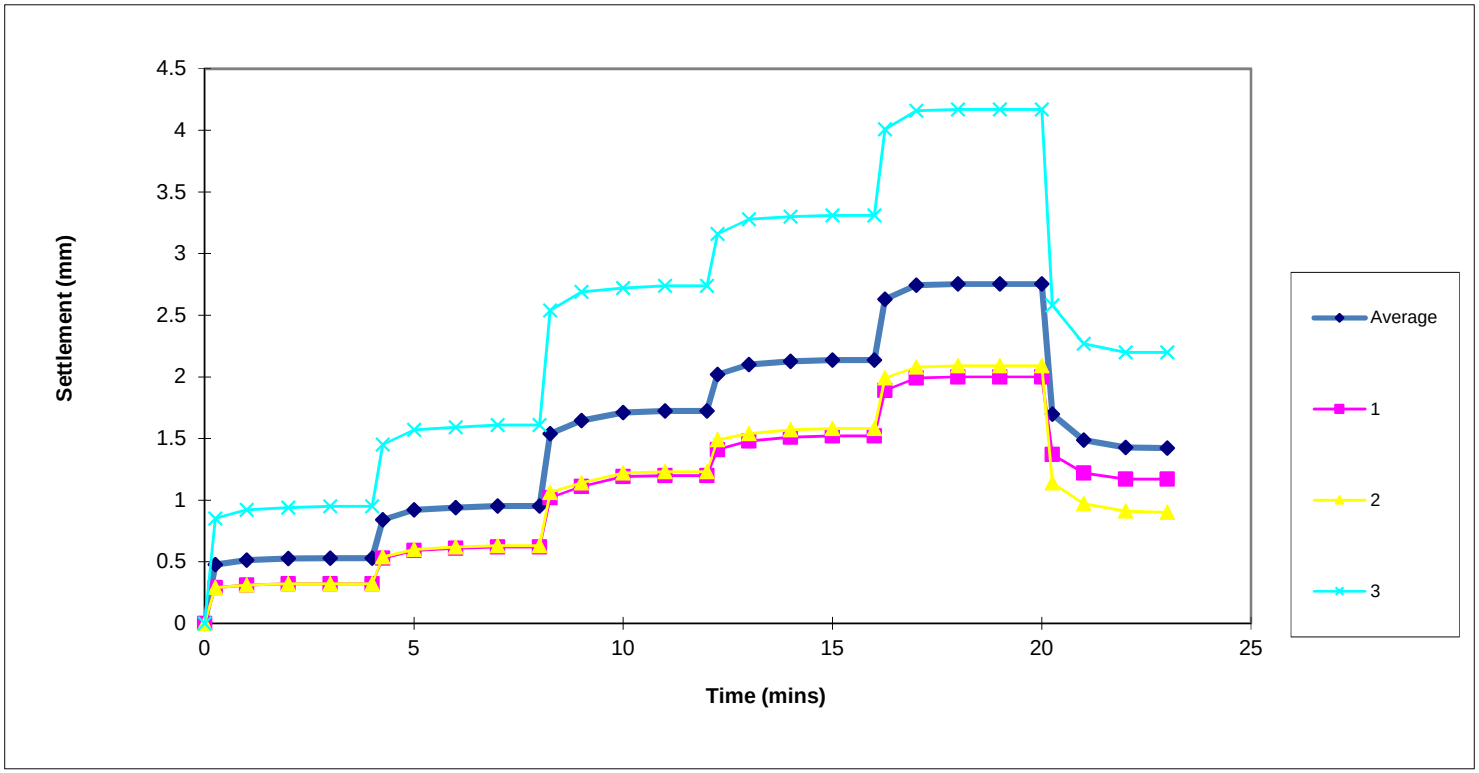
Contract: Merthyr Vale | Date: 20.07.18

Test Reference: P25 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.29	0.29	0.85	0.48
	1	0.31	0.31	0.92	0.51
	2	0.32	0.32	0.94	0.53
	3	0.32	0.32	0.95	0.53
	4	0.32	0.32	0.95	0.53
50kN/m^2 Load	4.25	0.53	0.54	1.45	0.84
	5	0.59	0.60	1.57	0.92
	6	0.61	0.62	1.59	0.94
	7	0.62	0.63	1.61	0.95
	8	0.62	0.63	1.61	0.95
75kN/m^2 Load	8.25	1.02	1.06	2.54	1.54
	9	1.11	1.14	2.69	1.65
	10	1.19	1.22	2.72	1.71
	11	1.20	1.23	2.74	1.72
	12	1.20	1.23	2.74	1.72
100kN/m^2 Load	12.25	1.41	1.49	3.16	2.02
	13	1.48	1.54	3.28	2.10
	14	1.51	1.57	3.30	2.13
	15	1.52	1.58	3.31	2.14
	16	1.52	1.58	3.31	2.14
125kN/m^2 Load	16.25	1.89	1.99	4.01	2.63
	17	1.99	2.08	4.16	2.74
	18	2.00	2.09	4.17	2.75
	19	2.00	2.09	4.17	2.75
	20	2.00	2.09	4.17	2.75
0kN/m^2 Unload	20.25	1.37	1.14	2.58	1.70
	21	1.22	0.97	2.27	1.49
	22	1.17	0.91	2.20	1.43
	23	1.17	0.90	2.20	1.42

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P25



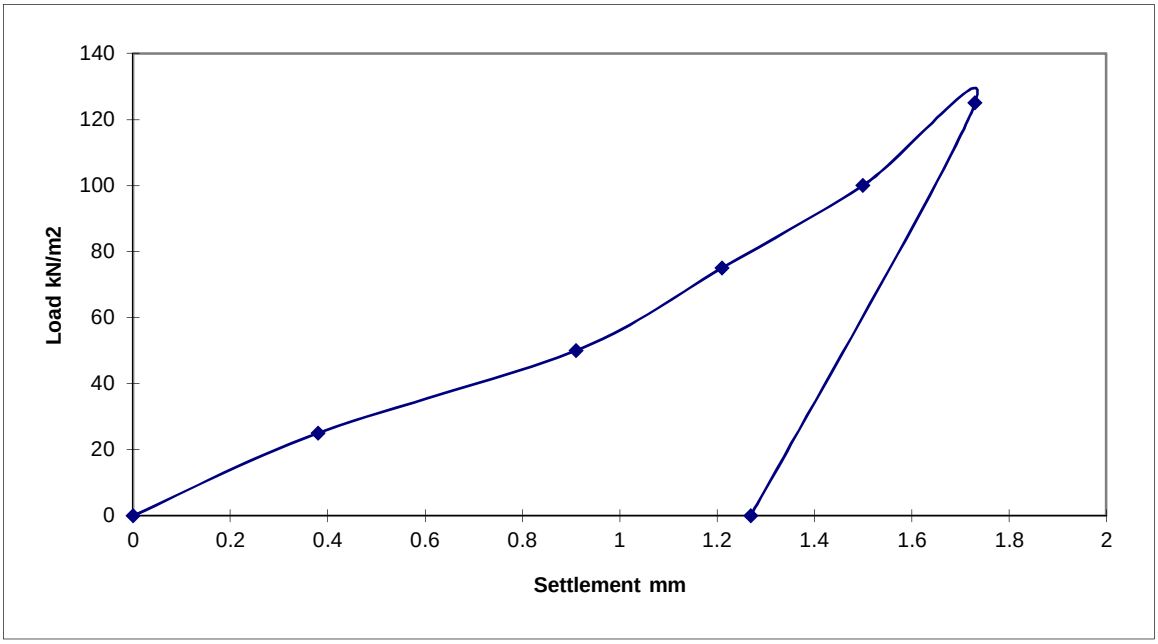
Contract: Merthyr Vale	Date: 20.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P26	Surface	600mm	Compacted coliery waste.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.38	25	4
0.91	50	8
1.21	75	12
1.50	100	16
1.73	125	20
1.27	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 0o.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

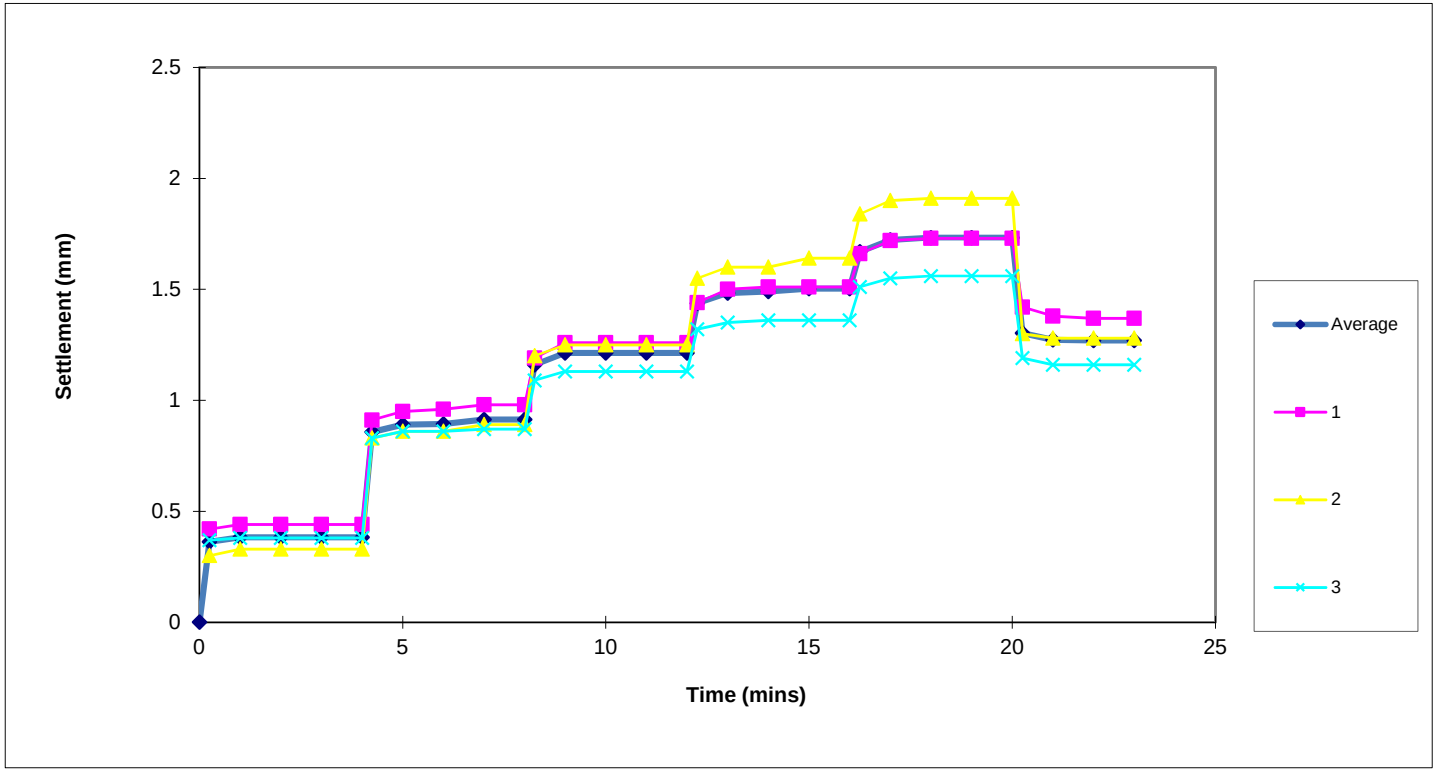
Contract: Merthyr Vale | Date: 06.08.18

Test Reference: P26 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2	0				0
Load	0.25	0.42	0.30	0.37	0.36
	1	0.44	0.33	0.38	0.38
	2	0.44	0.33	0.38	0.38
	3	0.44	0.33	0.38	0.38
	4	0.44	0.33	0.38	0.38
50kN/m^2	4.25	0.91	0.83	0.83	0.86
Load	5	0.95	0.86	0.86	0.89
	6	0.96	0.86	0.86	0.89
	7	0.98	0.89	0.87	0.91
	8	0.98	0.89	0.87	0.91
75kN/m^2	8.25	1.19	1.20	1.09	1.16
Load	9	1.26	1.25	1.13	1.21
	10	1.26	1.25	1.13	1.21
	11	1.26	1.25	1.13	1.21
	12	1.26	1.25	1.13	1.21
100kN/m^2	12.25	1.44	1.55	1.32	1.44
Load	13	1.50	1.60	1.35	1.48
	14	1.51	1.60	1.36	1.49
	15	1.51	1.64	1.36	1.50
	16	1.51	1.64	1.36	1.50
125kN/m^2	16.25	1.66	1.84	1.51	1.67
Load	17	1.72	1.90	1.55	1.72
	18	1.73	1.91	1.56	1.73
	19	1.73	1.91	1.56	1.73
	20	1.73	1.91	1.56	1.73
0kN/m^2	20.25	1.42	1.30	1.19	1.30
Unload	21	1.38	1.28	1.16	1.27
	22	1.37	1.28	1.16	1.27
	23	1.37	1.28	1.16	1.27

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P26



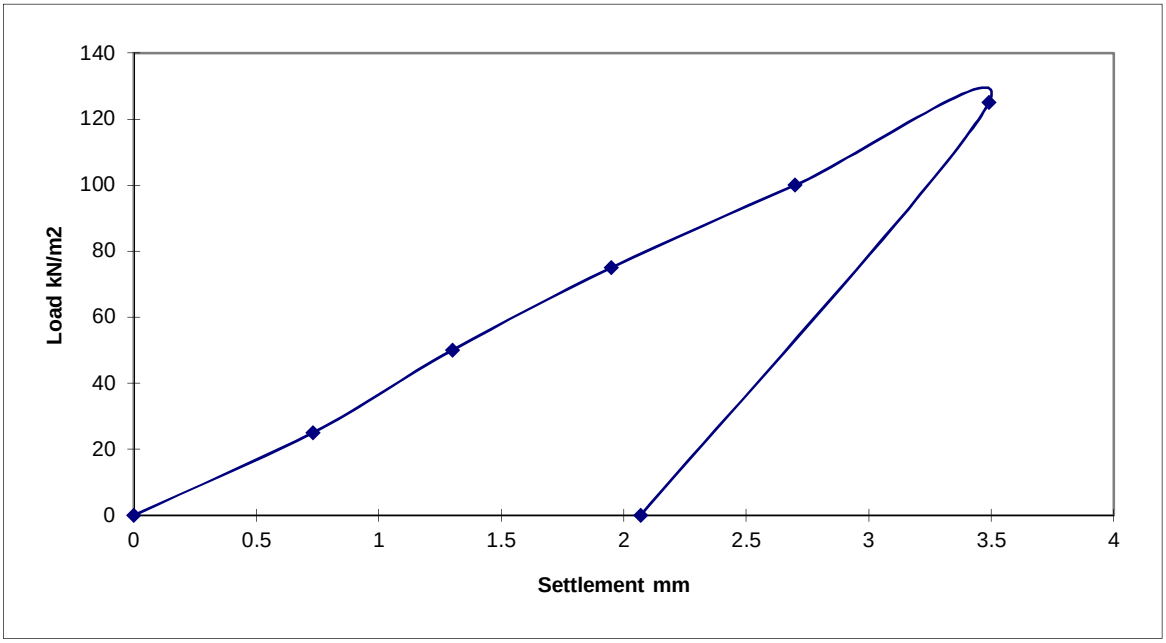
Contract: Merthyr Vale	Date: 06.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: P27	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Black grey sandy Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.73	25	4
1.30	50	8
1.95	75	12
2.70	100	16
3.49	125	20
2.07	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 20.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

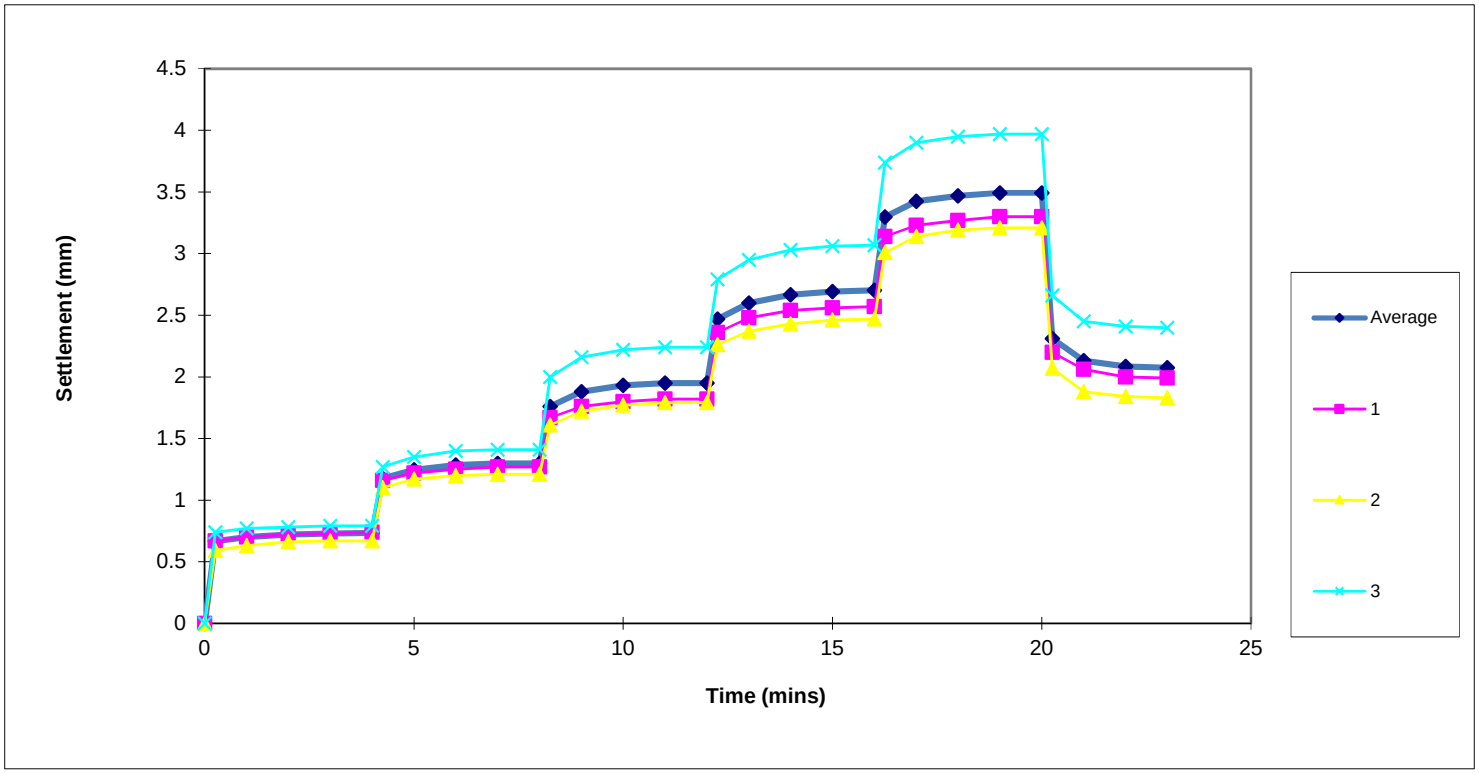
Contract: Merthyr Vale | Date: 20.07.18

Test Reference: P27 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.67	0.59	0.74	0.67
	1	0.70	0.63	0.77	0.70
	2	0.72	0.66	0.78	0.72
	3	0.73	0.67	0.79	0.73
	4	0.74	0.67	0.79	0.73
50kN/m^2 Load	4.25	1.16	1.10	1.27	1.18
	5	1.22	1.17	1.35	1.25
	6	1.25	1.20	1.40	1.28
	7	1.27	1.21	1.41	1.30
	8	1.27	1.21	1.41	1.30
75kN/m^2 Load	8.25	1.67	1.61	2.00	1.76
	9	1.76	1.72	2.16	1.88
	10	1.80	1.77	2.22	1.93
	11	1.82	1.79	2.24	1.95
	12	1.82	1.79	2.24	1.95
100kN/m^2 Load	12.25	2.36	2.26	2.79	2.47
	13	2.48	2.37	2.95	2.60
	14	2.54	2.43	3.03	2.67
	15	2.56	2.46	3.06	2.69
	16	2.57	2.47	3.07	2.70
125kN/m^2 Load	16.25	3.14	3.01	3.74	3.30
	17	3.23	3.14	3.90	3.42
	18	3.27	3.19	3.95	3.47
	19	3.30	3.21	3.97	3.49
	20	3.30	3.21	3.97	3.49
0kN/m^2 Unload	20.25	2.20	2.07	2.66	2.31
	21	2.06	1.88	2.45	2.13
	22	2.00	1.84	2.41	2.08
	23	1.99	1.83	2.40	2.07

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P27



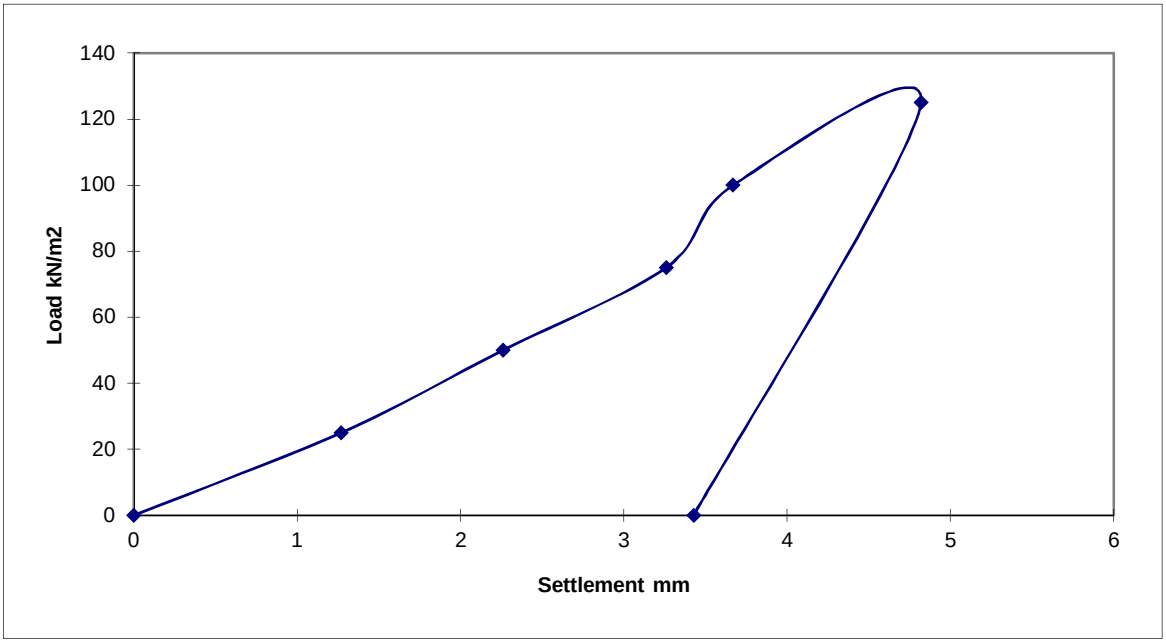
Contract: Merthyr Vale	Date: 20.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: P28	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Black grey sandy Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.27	25	4
2.26	50	8
3.26	75	12
3.67	100	16
4.82	125	20
3.43	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 20.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

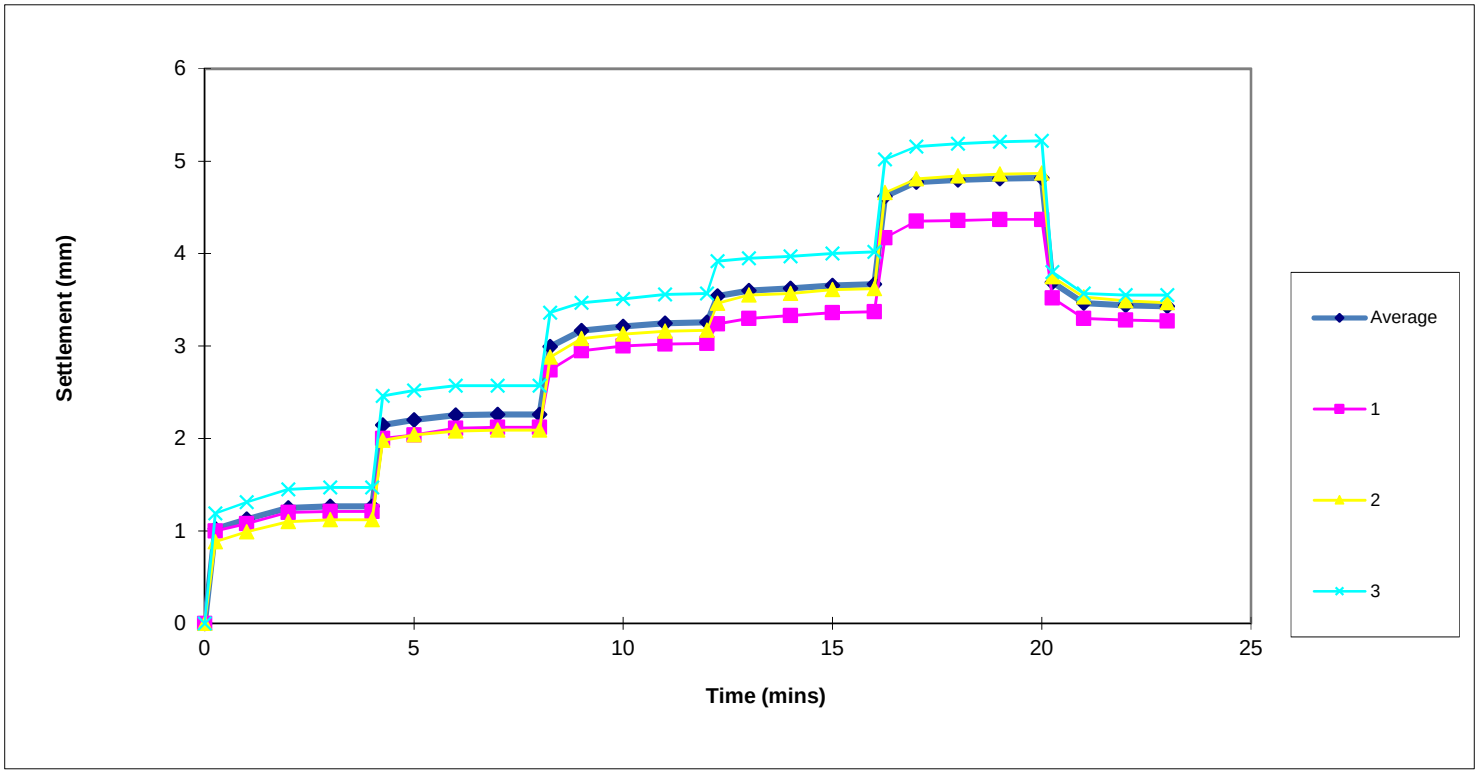
Contract: Merthyr Vale | Date: 20.07.18

Test Reference: P28 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	1.00	0.88	1.19	1.02
	1	1.08	0.99	1.31	1.13
	2	1.20	1.10	1.45	1.25
	3	1.21	1.12	1.47	1.27
	4	1.21	1.12	1.47	1.27
50kN/m^2 Load	4.25	2.00	1.98	2.46	2.15
	5	2.04	2.04	2.52	2.20
	6	2.11	2.08	2.57	2.25
	7	2.12	2.09	2.57	2.26
	8	2.12	2.09	2.57	2.26
75kN/m^2 Load	8.25	2.74	2.88	3.36	2.99
	9	2.95	3.08	3.47	3.17
	10	3.00	3.13	3.51	3.21
	11	3.02	3.16	3.56	3.25
	12	3.03	3.17	3.57	3.26
100kN/m^2 Load	12.25	3.24	3.46	3.92	3.54
	13	3.30	3.55	3.95	3.60
	14	3.33	3.57	3.97	3.62
	15	3.36	3.61	4.00	3.66
	16	3.37	3.62	4.02	3.67
125kN/m^2 Load	16.25	4.17	4.66	5.02	4.62
	17	4.35	4.81	5.16	4.77
	18	4.36	4.84	5.19	4.80
	19	4.37	4.86	5.21	4.81
	20	4.37	4.87	5.22	4.82
0kN/m^2 Unload	20.25	3.52	3.75	3.80	3.69
	21	3.30	3.53	3.57	3.47
	22	3.28	3.49	3.55	3.44
	23	3.27	3.47	3.55	3.43

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P28



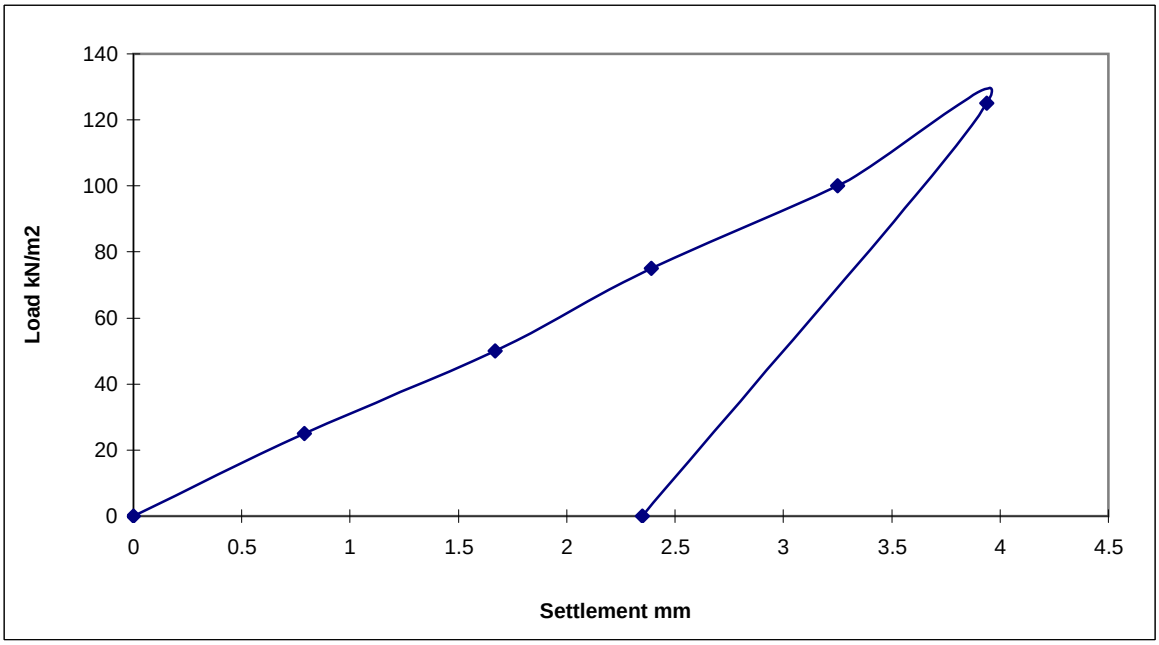
Contract: Merthyr Vale	Date: 20.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P29	Surface	600mm	Compacted coliery watse

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.79	25	4
1.67	50	8
2.39	75	12
3.25	100	16
3.94	125	20
2.35	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 27.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

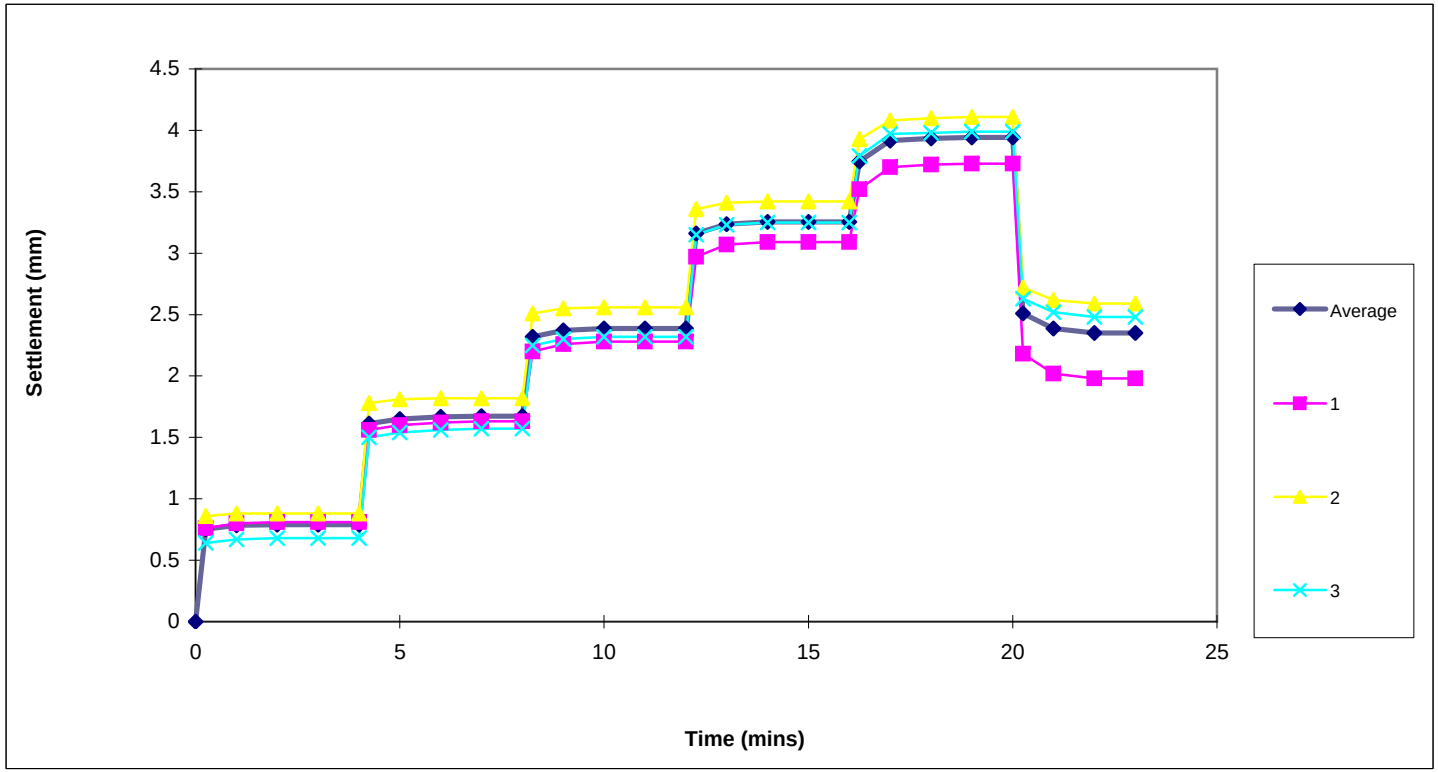
Contract: Merthyr Vale | Date: 27.07.18

Test Reference: P29 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2	0				0
Load	0.25	0.76	0.86	0.64	0.75
	1	0.80	0.88	0.67	0.78
	2	0.81	0.88	0.68	0.79
	3	0.81	0.88	0.68	0.79
	4	0.81	0.88	0.68	0.79
50kN/m^2	4.25	1.56	1.78	1.50	1.61
Load	5	1.60	1.81	1.54	1.65
	6	1.62	1.82	1.56	1.67
	7	1.63	1.82	1.57	1.67
	8	1.63	1.82	1.57	1.67
75kN/m^2	8.25	2.20	2.51	2.25	2.32
Load	9	2.26	2.55	2.30	2.37
	10	2.28	2.56	2.32	2.39
	11	2.28	2.56	2.32	2.39
	12	2.28	2.56	2.32	2.39
100kN/m^2	12.25	2.97	3.36	3.15	3.16
Load	13	3.07	3.41	3.23	3.24
	14	3.09	3.42	3.25	3.25
	15	3.09	3.42	3.25	3.25
	16	3.09	3.42	3.25	3.25
125kN/m^2	16.25	3.52	3.93	3.79	3.75
Load	17	3.70	4.08	3.97	3.92
	18	3.72	4.10	3.98	3.93
	19	3.73	4.11	3.99	3.94
	20	3.73	4.11	3.99	3.94
0kN/m^2	20.25	2.18	2.72	2.63	2.51
Unload	21	2.02	2.62	2.52	2.39
	22	1.98	2.59	2.48	2.35
	23	1.98	2.59	2.48	2.35

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P29



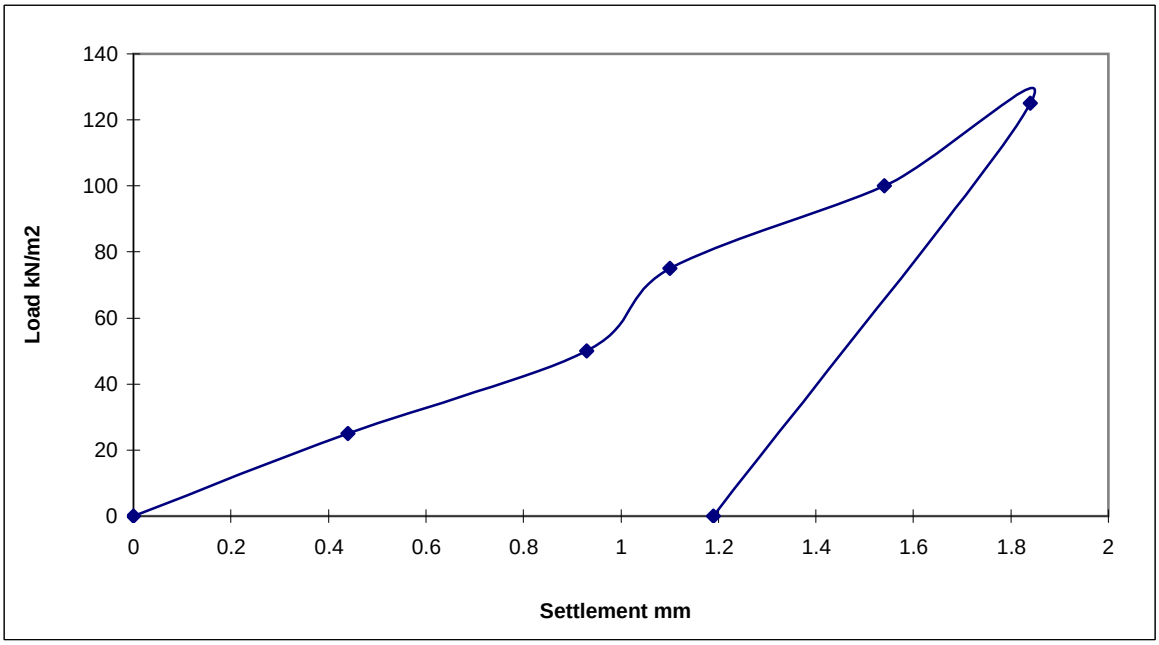
Contract: Merthyr Vale	Date: 27.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P30	Surface	600mm	Compacted coliery watse

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.44	25	4
0.93	50	8
1.10	75	12
1.54	100	16
1.84	125	20
1.19	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 27.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

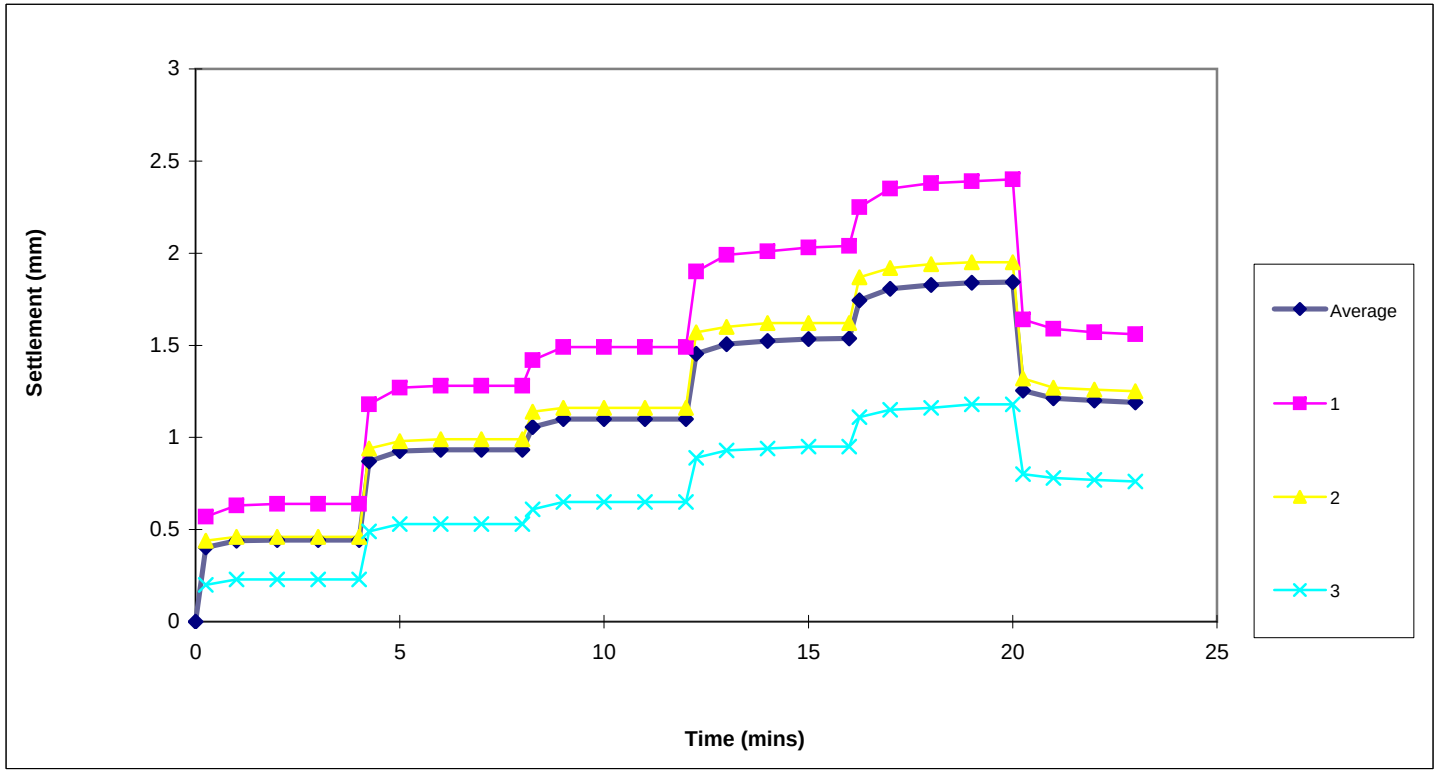
Contract: Merthyr Vale | Date: 27.07.18

Test Reference: P30 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.57	0.44	0.20	0.40
	1	0.63	0.46	0.23	0.44
	2	0.64	0.46	0.23	0.44
	3	0.64	0.46	0.23	0.44
	4	0.64	0.46	0.23	0.44
50kN/m^2 Load	4.25	1.18	0.94	0.49	0.87
	5	1.27	0.98	0.53	0.93
	6	1.28	0.99	0.53	0.93
	7	1.28	0.99	0.53	0.93
	8	1.28	0.99	0.53	0.93
75kN/m^2 Load	8.25	1.42	1.14	0.61	1.06
	9	1.49	1.16	0.65	1.10
	10	1.49	1.16	0.65	1.10
	11	1.49	1.16	0.65	1.10
	12	1.49	1.16	0.65	1.10
100kN/m^2 Load	12.25	1.90	1.57	0.89	1.45
	13	1.99	1.60	0.93	1.51
	14	2.01	1.62	0.94	1.52
	15	2.03	1.62	0.95	1.53
	16	2.04	1.62	0.95	1.54
125kN/m^2 Load	16.25	2.25	1.87	1.11	1.74
	17	2.35	1.92	1.15	1.81
	18	2.38	1.94	1.16	1.83
	19	2.39	1.95	1.18	1.84
	20	2.40	1.95	1.18	1.84
0kN/m^2 Unload	20.25	1.64	1.32	0.80	1.25
	21	1.59	1.27	0.78	1.21
	22	1.57	1.26	0.77	1.20
	23	1.56	1.25	0.76	1.19

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P30



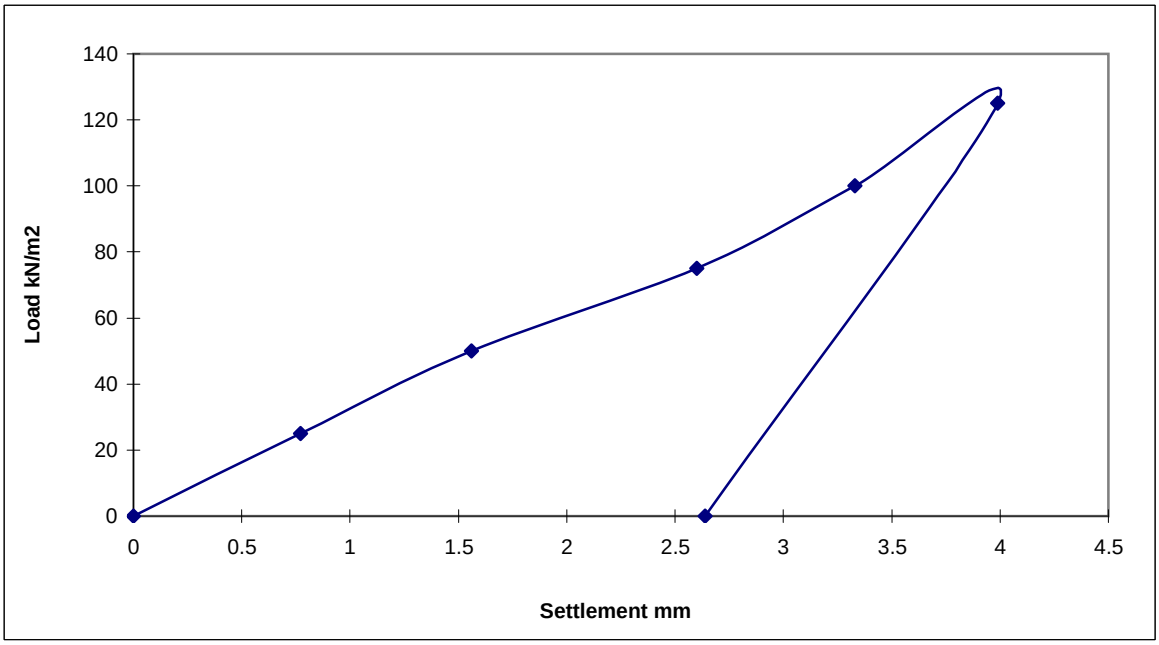
Contract: Merthyr Vale	Date: 27.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P31	Surface	600mm	Compacted coliery watse

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.77	25	4
1.56	50	8
2.60	75	12
3.33	100	16
3.99	125	20
2.64	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 27.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

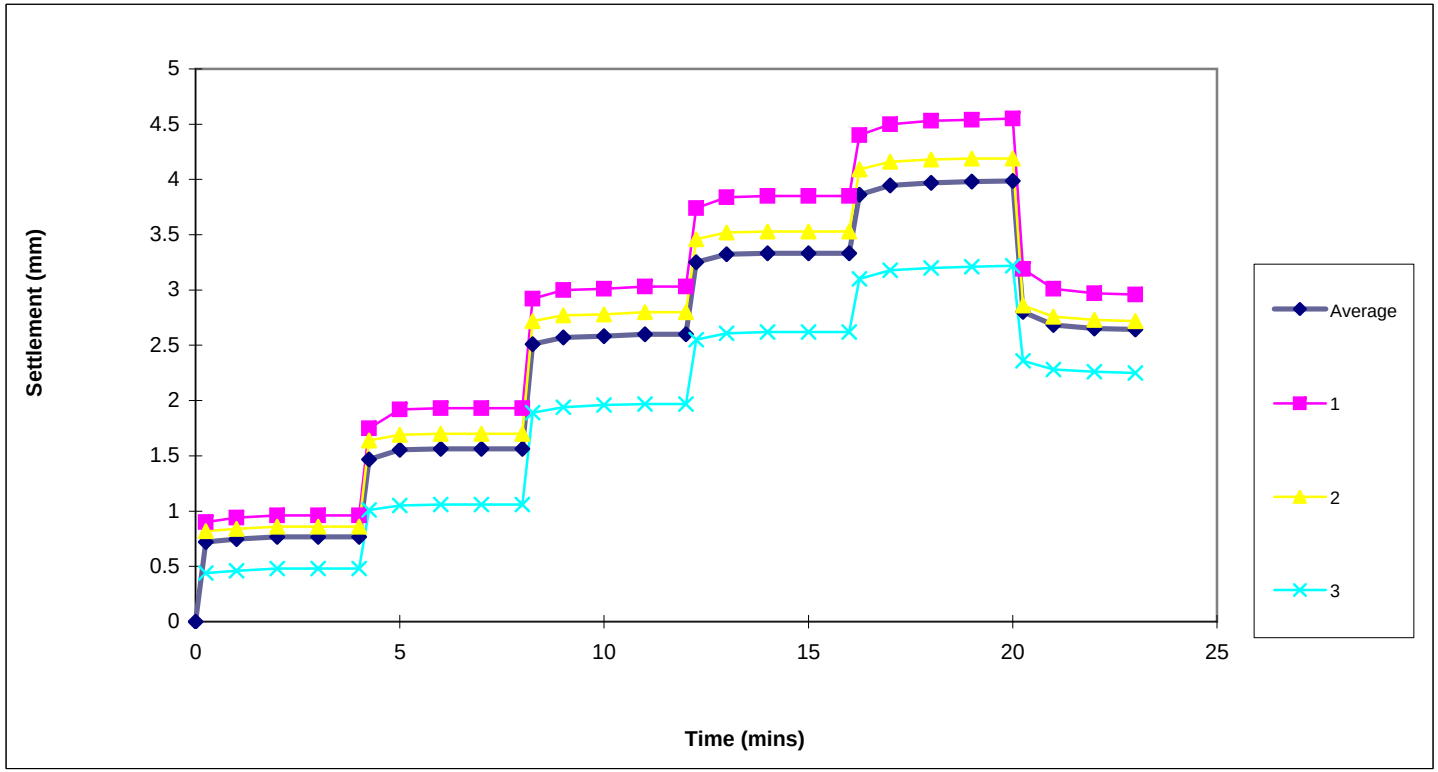
Contract: Merthyr Vale | Date: 27.07.18

Test Reference: P31 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.90	0.82	0.44	0.72
	1	0.94	0.84	0.46	0.75
	2	0.96	0.86	0.48	0.77
	3	0.96	0.86	0.48	0.77
	4	0.96	0.86	0.48	0.77
50kN/m^2 Load	4.25	1.75	1.64	1.01	1.47
	5	1.92	1.69	1.05	1.55
	6	1.93	1.70	1.06	1.56
	7	1.93	1.70	1.06	1.56
	8	1.93	1.70	1.06	1.56
75kN/m^2 Load	8.25	2.92	2.72	1.89	2.51
	9	3.00	2.77	1.94	2.57
	10	3.01	2.78	1.96	2.58
	11	3.03	2.80	1.97	2.60
	12	3.03	2.80	1.97	2.60
100kN/m^2 Load	12.25	3.74	3.46	2.55	3.25
	13	3.84	3.52	2.61	3.32
	14	3.85	3.53	2.62	3.33
	15	3.85	3.53	2.62	3.33
	16	3.85	3.53	2.62	3.33
125kN/m^2 Load	16.25	4.40	4.09	3.10	3.86
	17	4.50	4.16	3.18	3.95
	18	4.53	4.18	3.20	3.97
	19	4.54	4.19	3.21	3.98
	20	4.55	4.19	3.22	3.99
0kN/m^2 Unload	20.25	3.19	2.86	2.36	2.80
	21	3.01	2.76	2.28	2.68
	22	2.97	2.73	2.26	2.65
	23	2.96	2.72	2.25	2.64

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P31



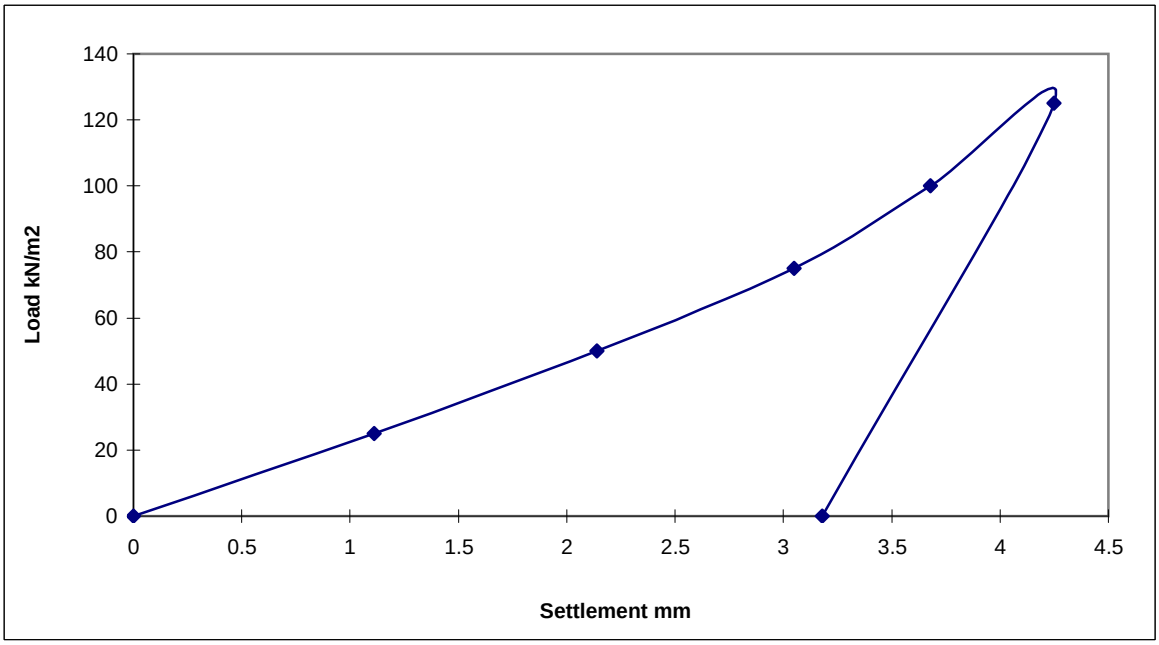
Contract: Merthyr Vale	Date: 27.07.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P32	Surface	600mm	Compacted coliery watse

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.11	25	4
2.14	50	8
3.05	75	12
3.68	100	16
4.25	125	20
3.18	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 27.07.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

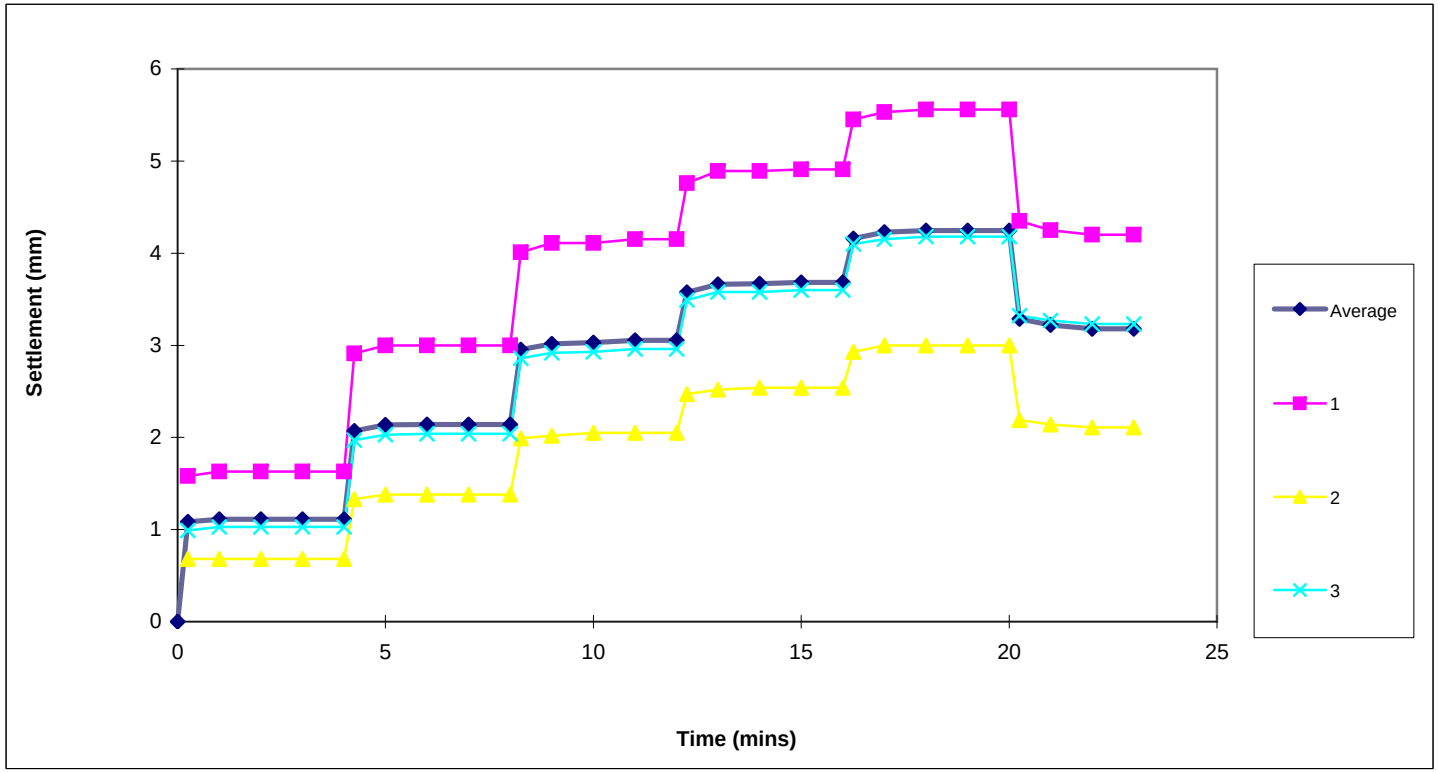
Contract: Merthyr Vale | Date: 27.07.18

Test Reference: P32 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2	0				0
Load	0.25	1.58	0.68	0.99	1.08
	1	1.63	0.68	1.03	1.11
	2	1.63	0.68	1.03	1.11
	3	1.63	0.68	1.03	1.11
	4	1.63	0.68	1.03	1.11
50kN/m^2	4.25	2.91	1.33	1.97	2.07
Load	5	3.00	1.38	2.03	2.14
	6	3.00	1.38	2.04	2.14
	7	3.00	1.38	2.04	2.14
	8	3.00	1.38	2.04	2.14
75kN/m^2	8.25	4.01	1.99	2.86	2.95
Load	9	4.11	2.02	2.92	3.02
	10	4.11	2.05	2.93	3.03
	11	4.15	2.05	2.96	3.05
	12	4.15	2.05	2.96	3.05
100kN/m^2	12.25	4.76	2.47	3.49	3.57
Load	13	4.89	2.52	3.58	3.66
	14	4.89	2.54	3.58	3.67
	15	4.91	2.54	3.60	3.68
	16	4.91	2.54	3.60	3.68
125kN/m^2	16.25	5.45	2.93	4.10	4.16
Load	17	5.53	3.00	4.15	4.23
	18	5.56	3.00	4.18	4.25
	19	5.56	3.00	4.18	4.25
	20	5.56	3.00	4.18	4.25
	20.25	4.35	2.19	3.32	3.29
0kN/m^2	21	4.25	2.14	3.27	3.22
Unload	22	4.20	2.11	3.23	3.18
	23	4.20	2.11	3.23	3.18

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P32

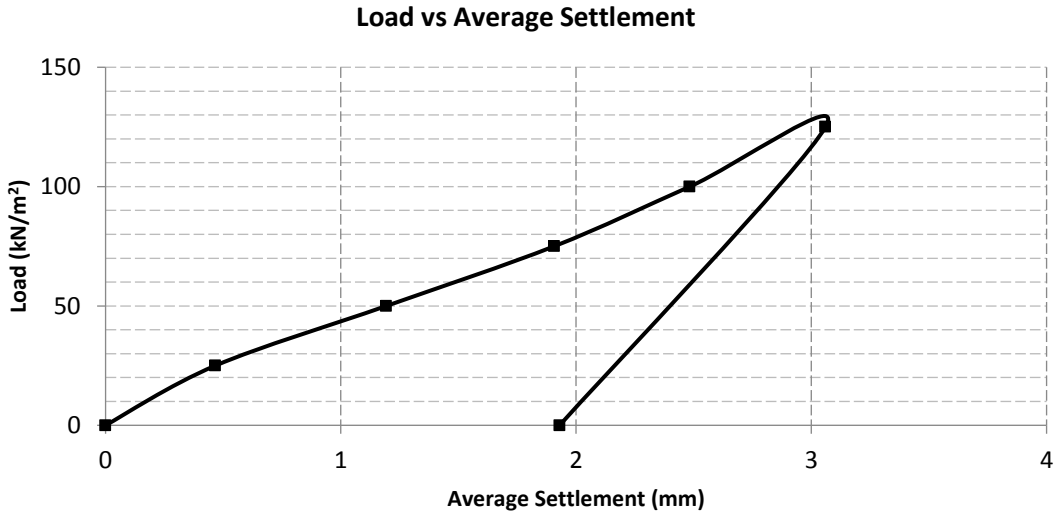


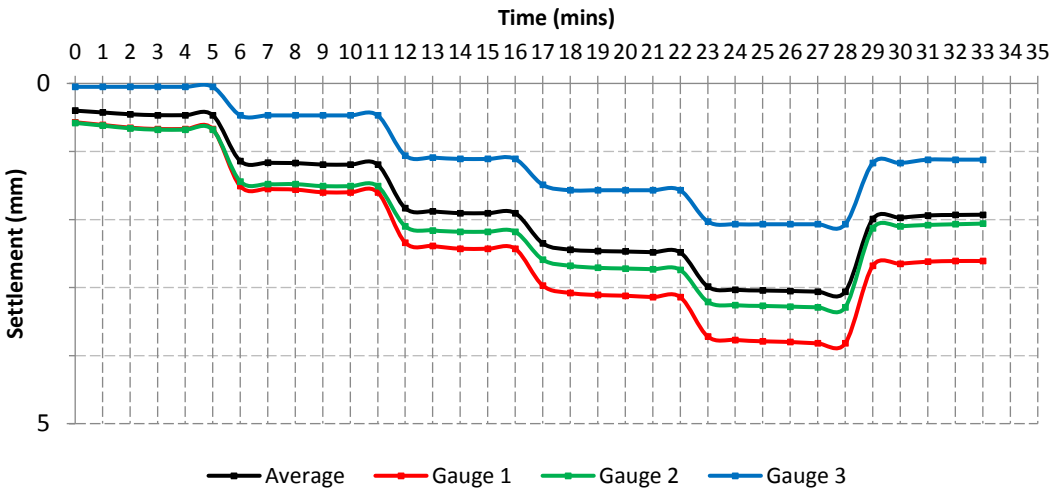
Contract: Merthyr Vale	Date: 27.07.18

Intégral Géotechnique
Integral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 3LE
Tel: 029 2080 7991
mail@integralgeotec.com

Plate Load Test Result Summary

Job Name and Number	Riverside, Merthyr Vale 12236		
Test Reference	P33	**Date**	22/08/2018
Test Depth (m bgl)	1.0	**Operator**	MB
Plate Diameter (mm)	600	**Kentledge**	21T Excavator
Seating Load (kN/m²)	3	**Sheet no.**	2 of 2
Surface description	Colliery Spoil		





Notes: Test carried out in general accordance with BS 1377: Part 9 1990

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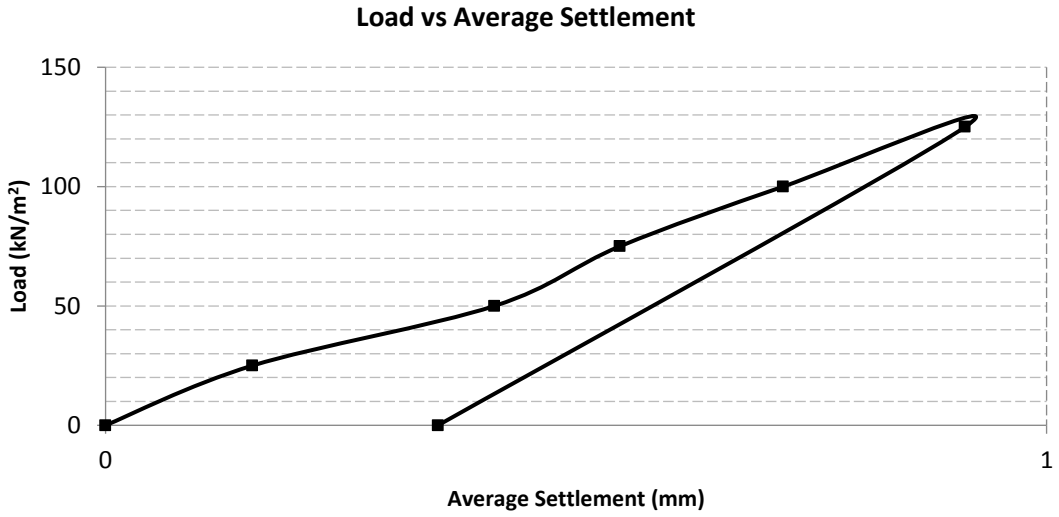
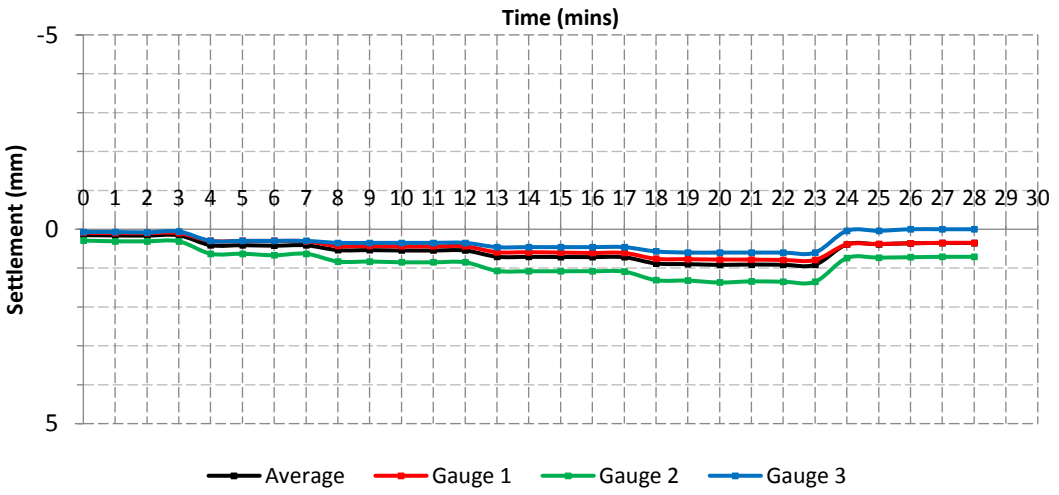
Plate Load Test Result Summary

Job Name and Number	Riverside, Merthyr Vale 12236		
Test Reference	P34	**Date**	22/08/2018
Test Depth (m bgl)	1.0	**Operator**	MB
Plate Diameter (mm)	600	**Kentledge**	21T Excavator
Seating Load (kN/m²)	3	**Sheet no.**	2 of 2
Surface description	Colliery Spoil		





Notes: Test carried out in general accordance with BS 1377: Part 9 1990

APPENDIX K

IN SITU TEST RESULTS – PLATE LOAD AND CPT TESTS (VALIDATION OF REMEDIATION SURFACE)

INTERIM

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date:** 03.08.18

Hole Ref	CPT 1				
Depth	Blows per 75mm				SPT N
0.00-0.30	4	5	4	5	18
0.30-0.60	7	11	5	4	27
0.60-0.90	3	4	5	6	18
0.90-1.20	3	2	2	2	9
1.20-1.50	3	5	4	5	17
1.50-1.80	4	5	9	5	23
1.80-2.10	5	8	9	9	31
2.10-2.34	10	15	19	6	50/235

Hole Ref	CPT 2				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	4	5	4	15
0.30-0.60	5	4	4	3	16
0.60-0.90	3	3	5	5	16
0.90-1.20	5	4	5	6	20
1.20-1.50	4	4	5	5	18
1.50-1.80	5	5	5	5	20
1.80-2.10	4	6	6	9	25
2.10-2.40	5	4	3	2	14
2.40-2.70	2	3	3	4	12
2.70-3.00	3	2	2	3	10

Hole Ref	CPT 3				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	4	4	4	14
0.30-0.60	4	5	6	7	22
0.60-0.90	7	6	8	9	30
0.90-1.20	8	5	5	4	22
1.20-1.50	3	4	6	9	22
1.50-1.80	6	7	6	6	25
1.80-2.10	4	5	4	3	16
2.10-2.40	3	6	12	8	29
2.40-2.70	6	6	4	5	21
2.70-3.00	4	3	3	5	15

Hole Ref	CPT 4				
Depth	Blows per 75mm				SPT N
0.00-0.30	3	4	3	3	13
0.30-0.60	6	10	9	8	33
0.60-0.90	8	7	7	6	28
0.90-1.20	6	6	5	7	24
1.20-1.50	7	8	7	7	29
1.50-1.80	5	5	6	5	21
1.80-2.10	7	7	6	6	26
2.10-2.40	6	6	6	5	23
2.40-2.70	5	5	4	4	18
2.70-3.00	4	4	4	3	15

Hole Ref	CPT 5				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	3	3	3	11
0.30-0.60	3	2	4	4	13
0.60-0.90	4	4	6	8	22
0.90-1.20	9	8	9	8	34
1.20-1.50	10	12	8	9	39
1.50-1.80	12	20	9	5	46
1.80-2.04	9	11	20	10	50/235

Hole Ref	CPT 6				
Depth	Blows per 75mm				SPT N
0.00-0.30	3	5	4	4	16
0.30-0.60	5	7	5	4	21
0.60-0.90	6	5	7	9	27
0.90-1.20	8	9	7	7	31
1.20-1.50	6	4	5	3	18
1.50-1.80	3	4	4	3	14
1.80-2.10	2	3	3	3	11
2.10-2.40	3	2	5	4	14
2.40-2.70	3	3	3	2	11
2.70-3.00	1	3	4	6	14

Hole Ref	CPT 7				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	3	3	2	10
0.30-0.60	2	3	2	3	10
0.60-0.90	2	1	2	3	8
0.90-1.20	4	9	9	7	29
1.20-1.50	8	7	7	6	28
1.50-1.80	6	5	4	5	20
1.80-2.10	7	5	4	4	20
2.10-2.40	4	4	4	4	16
2.40-2.66	4	4	9	33	50/30

Hole Ref	CPT 8				
Depth	Blows per 75mm				SPT N
0.00-0.30	3	4	3	2	12
0.30-0.60	2	2	2	3	9
0.60-0.90	2	3	3	3	11
0.90-1.20	3	3	4	4	14
1.20-1.50	5	45	4	3	57
1.50-1.80	5	7	9	6	27
1.80-2.10	8	6	6	5	25
2.10-2.40	8	7	7	7	29
2.40-2.70	7	5	5	4	21
2.70-3.00	4	3	3	3	13
3.00-3.30					
3.30-3.60					
3.60-3.90					
3.90-4.20					
4.20-4.50					
4.50-4.80					
4.80-5.10					

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date:** 03.08.18

Hole Ref	CPT 9				
Depth	Blows per 75mm				SPT N
0.00-0.30	3	4	3	2	12
0.30-0.60	2	3	2	2	9
0.60-0.90	2	1	2	2	7
0.90-1.20	3	4	3	2	12
1.20-1.50	1	2	2	3	8
1.50-1.80	3	3	4	3	13
1.80-2.10	3	3	3	4	13
2.10-2.40	8	8	9	8	33
2.40-2.70	6	5	5	4	20
2.70-3.00	4	3	4	4	15

Hole Ref	CPT 10				
Depth	Blows per 75mm				SPT N
0.00-0.30	3	5	5	4	17
0.30-0.60	5	4	4	2	15
0.60-0.90	2	2	2	3	9
0.90-1.20	4	3	5	3	15
1.20-1.50	4	4	3	3	14
1.50-1.80	3	4	9	8	24
1.80-2.10	7	6	7	7	27
2.10-2.40	8	8	8	8	32
2.40-2.70	9	9	8	7	33
2.70-3.00	7	6	14	13	40

Hole Ref	CPT 11				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	3	2	2	9
0.30-0.60	1	2	3	3	9
0.60-0.90	3	3	2	3	11
0.90-1.20	4	4	4	5	17
1.20-1.50	4	3	3	2	12
1.50-1.80	3	3	4	3	13
1.80-2.10	4	5	6	7	22
2.10-2.40	13	11	8	7	39
2.40-2.70	6	6	4	4	20
2.70-3.00	3	3	2	2	10

Hole Ref	CPT 12				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	2	2	2	8
0.30-0.60	1	1	2	2	6
0.60-0.90	2	3	3	3	11
0.90-1.20	4	4	5	5	18
1.20-1.50	5	4	4	5	18
1.50-1.80	6	6	7	7	26
1.80-2.10	6	7	6	6	25
2.10-2.40	5	4	3	4	16
2.40-2.70	3	3	2	2	10
2.70-3.00	2	1	1	1	5

Hole Ref	CPT 13				
Depth	Blows per 75mm				SPT N
0.00-0.30	3	3	2	2	10
0.30-0.60	2	4	4	4	14
0.60-0.90	3	3	2	3	11
0.90-1.20	2	3	4	4	13
1.20-1.50	4	15	12	5	36
1.50-1.80	5	8	6	4	23
1.80-2.10	4	4	3	4	15
2.10-2.40	5	4	2	1	12
2.40-2.70	2	1	1	2	6
2.70-3.00	4	5	5	5	19

Hole Ref	CPT 14				
Depth	Blows per 75mm				SPT N
0.00-0.30	4	4	5	5	18
0.30-0.60	4	4	3	5	16
0.60-0.90	3	3	3	3	12
0.90-1.20	7	6	5	6	24
1.20-1.50	6	6	6	5	23
1.50-1.80	6	5	4	4	19
1.80-2.10	5	5	6	6	22
2.10-2.40	4	3	2	3	12
2.40-2.70	2	2	3	6	13
2.70-3.00	6	4	3	2	15

Hole Ref	CPT 15				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	2	5	3	12
0.30-0.60	5	4	4	4	17
0.60-0.90	3	4	2	2	11
0.90-1.20	4	4	5	7	20
1.20-1.50	7	7	7	7	28
1.50-1.80	7	6	7	5	25
1.80-2.10	6	5	7	6	24
2.10-2.40	6	4	4	6	20
2.40-2.70	7	6	3	3	19
2.70-3.00	2	1	1	1	5

Hole Ref					
Depth	Blows per 75mm				SPT N
0.00-0.30					
0.30-0.60					
0.60-0.90					
0.90-1.20					
1.20-1.50					
1.50-1.80					
1.80-2.10					
2.10-2.40					
2.40-2.70					
2.70-3.00					

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date: 17.08.18**

Hole Ref CPT 16

Depth	Blows per 75mm				SPT N
0.00-0.30	3	3	3	4	13
0.30-0.60	3	4	3	4	14
0.60-0.90	4	3	1	1	9
0.90-1.20	2	2	3	5	12
1.20-1.50	5	4	3	3	15
1.50-1.80	8	7	7	5	27
1.80-2.10	5	5	6	3	19
2.10-2.40	3	3	5	10	21
2.40-2.70	10	10	11	10	41
2.70-3.00	10	9	6	6	31

Hole Ref CPT 17

Depth	Blows per 75mm				SPT N
0.00-0.30	1	2	2	1	6
0.30-0.60	1	1	2	1	5
0.60-0.90	2	2	4	5	13
0.90-1.20	3	3	4	6	16
1.20-1.50	6	6	4	4	20
1.50-1.80	3	5	7	9	24
1.80-2.10	8	7	7	7	29
2.10-2.40	9	11	11	9	40
2.40-2.70	8	8	7	5	28
2.70-3.00	6	6	5	5	22

Hole Ref CPT 27

Depth	Blows per 75mm				SPT N
0.00-0.30	2	3	2	3	10
0.30-0.60	3	2	2	3	10
0.60-0.90	4	3	3	2	12
0.90-1.20	1	1	3	4	9
1.20-1.50	3	3	2	6	14
1.50-1.80	7	6	7	6	26
1.80-2.10	5	6	7	8	26
2.10-2.40	9	10	6	7	32
2.40-2.70	6	4	5	2	17
2.70-3.00	2	1	2	1	6

Hole Ref CPT 28

Depth	Blows per 75mm				SPT N
0.00-0.30	3	3	4	3	13
0.30-0.60	2	3	5	5	15
0.60-0.90	7	4	3	4	18
0.90-1.20	3	3	4	3	13
1.20-1.50	3	2	3	5	13
1.50-1.80	11	10	8	6	35
1.80-2.10	7	12	11	10	40
2.10-2.40	10	12	12	10	44
2.40-2.67	8	9	15	18	50/265

Hole Ref CPT 29

Depth	Blows per 75mm				SPT N
0.00-0.30	2	2	2	2	8
0.30-0.60	1	2	2	3	8
0.60-0.90	4	4	2	3	13
0.90-1.20	3	2	3	4	12
1.20-1.50	7	7	8	7	29
1.50-1.80	6	7	6	7	26
1.80-2.10	7	7	7	8	29
2.10-2.40	8	8	7	6	29
2.40-2.70	6	8	6	5	25
2.70-3.00	5	4	3	2	14

Hole Ref CPT 30

Depth	Blows per 75mm				SPT N
0.00-0.30	1	2	1	2	6
0.30-0.60	2	2	3	3	10
0.60-0.90	2	1	2	2	7
0.90-1.20	5	5	5	6	21
1.20-1.50	6	5	5	12	28
1.50-1.80	15	10	10	11	46
1.80-2.05	11	15	16	8	50/245

Hole Ref CPT 31

Depth	Blows per 75mm				SPT N
0.00-0.30	1	1	1	2	5
0.30-0.60	2	2	2	2	8
0.60-0.90	2	4	6	5	17
0.90-1.20	5	5	4	5	19
1.20-1.50	4	6	5	4	19
1.50-1.80	5	5	6	6	22
1.80-1.97	10	22	18		50/170

Hole Ref CPT 32

Depth	Blows per 75mm				SPT N
0.00-0.30	4	4	3	4	15
0.30-0.60	3	5	6	6	20
0.60-0.90	5	3	4	3	15
0.90-1.20	3	3	3	5	14
1.20-1.50	5	7	7	10	29
1.50-1.80	9	7	6	5	27
1.80-2.10	7	15	13	10	45
2.10-2.40	10	8	6	5	29
2.40-2.70	5	3	4	4	16
2.70-3.00	3	4	3	3	13

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date: 04.08.18**

Hole Ref	CPT 18				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	4	4	5	15
0.30-0.60	6	13	6	5	30
0.60-0.90	5	4	5	5	19
0.90-1.20	4	5	3	3	15
1.20-1.50	3	3	2	1	9
1.50-1.80	2	1	3	3	9
1.80-2.10	3	3	3	3	12
2.10-2.40	4	3	3	3	13
2.40-2.70	3	4	8	8	23
2.70-3.00	8	9	8	8	33
3.00-3.30	8	8	6	10	32
3.30-3.60	4	3	2	3	12

Hole Ref	CPT 19				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	3	2	2	9
0.30-0.60	2	2	2	3	9
0.60-0.90	5	3	4	4	16
0.90-1.20	4	4	2	3	13
1.20-1.50	3	4	4	4	15
1.50-1.80	4	4	4	4	16
1.80-2.10	5	4	5	8	22
2.10-2.40	9	4	3	5	21
2.40-2.70	8	9	8	8	33
2.70-3.00	7	6	6	8	27
3.00-3.19	12	16	22		50/190

Hole Ref	CPT 20				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	1	2	1	6
0.30-0.60	1	2	2	4	9
0.60-0.90	4	5	4	5	18
0.90-1.20	5	6	4	4	19
1.20-1.50	2	3	2	4	11
1.50-1.80	3	6	4	3	16
1.80-2.10	5	5	5	5	20
2.10-2.40	12	8	7	10	37
2.40-2.70	11	8	9	8	36
2.70-3.00	7	8	8	10	33
3.00-3.30	8	7	10	13	38
3.30-3.60	10	9	6	4	29

Hole Ref	CPT 21				
Depth	Blows per 75mm				SPT N
0.00-0.30	1	2	2	2	7
0.30-0.60	1	3	2	5	11
0.60-0.90	7	8	10	13	38
0.90-1.20	8	7	7	8	30
1.20-1.50	8	7	7	6	28
1.50-1.80	6	5	6	5	22
1.80-2.10	5	6	5	5	21
2.10-2.40	6	6	7	5	24
2.40-2.70	4	10	7	4	25
2.70-3.00	4	4	3	5	16
3.00-3.30	7	11	8	10	36
3.30-3.60	4	4	4	4	16

Hole Ref	CPT 22				
Depth	Blows per 75mm				SPT N
0.00-0.30	5	5	6	6	22
0.30-0.60	6	8	9	5	28
0.60-0.90	5	6	6	6	23
0.90-1.20	7	7	6	5	25
1.20-1.50	10	11	8	6	35
1.50-1.80	5	5	6	7	23
1.80-2.05	14	15	15	6	50/245

Hole Ref	CPT 23				
Depth	Blows per 75mm				SPT N
0.00-0.30	3	4	2	3	12
0.30-0.60	2	2	3	4	11
0.60-0.90	5	4	4	5	18
0.90-1.20	5	4	6	5	20
1.20-1.50	4	3	2	3	12
1.50-1.80	6	9	8	5	28
1.80-2.10	6	5	5	4	20
2.10-2.40	5	5	6	6	22
2.40-2.70	4	4	5	5	18
2.70-3.00	5	5	5	3	18

Hole Ref	CPT 24				
Depth	Blows per 75mm				SPT N
0.00-0.30	4	5	4	4	17
0.30-0.60	4	4	6	9	23
0.60-0.90	7	4	5	4	20
0.90-1.20	6	5	6	4	21
1.20-1.50	3	6	6	6	21
1.50-1.80	6	6	5	10	27
1.80-2.91	18	32			50/105

Hole Ref	CPT 25				
Depth	Blows per 75mm				SPT N
0.00-0.30	4	5	7	9	25
0.30-0.60	7	7	5	9	28
0.60-0.90	6	6	5	5	22
0.90-1.20	7	7	5	5	24
1.20-1.50	5	6	5	6	22
1.50-1.80	5	5	6	6	22
1.80-2.10	6	7	5	5	23
2.10-2.40	5	6	6	10	27
2.40-2.70	8	9	13	11	41
2.70-3.00	11	9	9	8	37

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date: 04.08.18**

Hole Ref	CPT 26				
Depth	Blows per 75mm				SPT N
0.00-0.30	3	3	1	4	11
0.30-0.60	5	4	4	4	17
0.60-0.90	3	4	4	4	15
0.90-1.20	4	5	5	6	20
1.20-1.50	4	4	3	4	15
1.50-1.80	4	3	4	3	14
1.80-2.10	2	4	4	5	15
2.10-2.40	5	6	10	12	33
2.40-2.70	12	10	12	9	43
2.70-3.00	8	7	6	6	27

Hole Ref					
Depth	Blows per 75mm				SPT N

Hole Ref					
Depth	Blows per 75mm				SPT N

Hole Ref					
Depth	Blows per 75mm				SPT N

Hole Ref					
Depth	Blows per 75mm				SPT N

Hole Ref					
Depth	Blows per 75mm				SPT N

Hole Ref					
Depth	Blows per 75mm				SPT N

Hole Ref					
Depth	Blows per 75mm				SPT N

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date: 17.08.18**

Hole Ref	CPT 33				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	2	3	3	10
0.30-0.60	3	2	2	2	9
0.60-0.90	2	2	4	4	12
0.90-1.20	5	5	6	5	21
1.20-1.50	5	4	4	5	18
1.50-1.80	6	9	9	8	32
1.80-2.10	8	8	10	10	36
2.10-2.36	12	14	13	11	50/255

Hole Ref	CPT 34				
Depth	Blows per 75mm				SPT N
0.00-0.30	1	0	2	3	6
0.30-0.60	4	3	5	3	15
0.60-0.90	3	3	2	2	10
0.90-1.20	2	3	3	5	13
1.20-1.50	8	1	8	9	26
1.50-1.80	8	11	10	10	39
1.80-2.10	11	11	8	8	38
2.10-2.40	11	12	10	5	38
2.40-2.70	4	3	2	2	11
2.70-3.00	3	3	4	5	15

Hole Ref	CPT 35				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	3	5	4	14
0.30-0.60	3	2	2	3	10
0.60-0.90	2	2	2	3	9
0.90-1.20	3	3	4	7	17
1.20-1.50	9	9	10	10	38
1.50-1.80	9	10	9	8	36
1.80-2.10	8	9	9	10	36
2.10-2.33	11	14	15	10	50/225

Hole Ref	CPT 36				
Depth	Blows per 75mm				SPT N
0.00-0.30	2	1	1	1	5
0.30-0.60	1	2	1	1	5
0.60-0.90	1	3	2	2	8
0.90-1.20	3	2	3	4	12
1.20-1.50	6	4	4	2	16
1.50-1.80	3	7	10	9	29
1.80-2.10	10	11	9	9	39
2.10-2.40	8	6	7	6	27
2.40-2.70	8	7	6	6	27
2.70-3.00	6	4	3	3	16

Hole Ref					
Depth	Blows per 75mm				SPT N

Hole Ref					
Depth	Blows per 75mm				SPT N

Hole Ref					
Depth	Blows per 75mm				SPT N

Hole Ref					
Depth	Blows per 75mm				SPT N

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date: 17.09.18**

Hole Ref CPT 37

Depth	Blows per 75mm				SPT N
0.00-0.30	1	2	2	1	6
0.30-0.60	2	3	6	8	19
0.60-0.90	8	8	9	8	33
0.90-1.20	7	6	8	12	33
1.20-1.50	10	8	10	12	40
1.50-1.80	11	15	12	15	53
1.80-2.10	12	13	13	12	50
2.10-2.40	10	11	8	6	35
2.40-2.45	50				50/75

Hole Ref CPT 38

Depth	Blows per 75mm				SPT N
0.00-0.30	1	2	1	2	6
0.30-0.60	2	2	2	6	12
0.60-0.90	3	6	3	5	17
0.90-1.20	5	6	8	9	28
1.20-1.50	7	8	10	12	37
1.50-1.80	11	10	10	10	41
1.80-2.10	9	11	10	10	40
2.10-2.40	10	12	8	10	40
2.40-2.70	10	9	8	10	37
2.70-3.00	7	6	3	3	19
3.00-3.30	2	3	3	5	13

Hole Ref CPT 39

Depth	Blows per 75mm				SPT N
0.00-0.30	1	1	1	1	4
0.30-0.60	1	2	2	8	13
0.60-0.90	2	4	3	3	12
0.90-1.20	8	5	7	11	31
1.20-1.50	12	14	10	10	46
1.50-1.80	10	13	15	14	52
1.80-2.10	11	10	11	9	41
2.10-2.40	8	9	6	6	29
2.40-2.70	6	4	4	6	20
2.70-3.00	4	3	3	3	13
3.00-3.30	4	4	4	8	20

Hole Ref CPT 40

Depth	Blows per 75mm				SPT N
0.00-0.30	1	0	1	2	4
0.30-0.60	2	4	4	3	13
0.60-0.90	3	2	6	5	16
0.90-1.20	7	7	7	7	28
1.20-1.50	7	10	12	10	39
1.50-1.80	10	11	11	13	45
1.80-2.10	9	11	8	8	36
2.10-2.40	8	7	6	5	26
2.40-2.70	5	8	9	11	33
2.70-3.00	9	7	6	5	27
3.00-3.30	5	4	4	5	18

Hole Ref CPT 41

Depth	Blows per 75mm				SPT N
0.00-0.30	1	0	1	1	3
0.30-0.60	5	6	6	6	23
0.60-0.90	3	5	6	7	21
0.90-1.20	6	11	13	10	40
1.20-1.50	12	13	15	14	54
1.50-1.68	10	11	29		50/180

Hole Ref CPT 42

Depth	Blows per 75mm				SPT N
0.00-0.30	0	1	1	1	3
0.30-0.60	1	1	2	2	6
0.60-0.90	3	2	7	10	22
0.90-1.20	8	11	7	10	36
1.20-1.50	10	13	13	12	48
1.50-1.80	11	11	12	15	49
1.80-2.05	16	13	7	14	50/245

Hole Ref CPT 43

Depth	Blows per 75mm				SPT N
0.00-0.30	1	1	1	1	4
0.30-0.60	1	2	4	4	11
0.60-0.90	2	2	2	3	9
0.90-1.20	3	9	3	6	21
1.20-1.50	4	7	12	13	36
1.50-1.80	11	13	10	11	45
1.80-2.10	12	14	14	14	54
2.10-2.40	12	10	11	12	45
2.40-2.57	21	20	9		50/170

Hole Ref

Depth	Blows per 75mm				SPT N

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date: 17.09.18**

Hole Ref CPT 44

Depth	Blows per 75mm				SPT N
0.00-0.30	1	1	2	2	6
0.30-0.60	2	3	3	2	10
0.60-0.90	3	2	3	6	14
0.90-1.20	12	10	11	12	45
1.20-1.50	12	15	13	13	53
1.50-1.75	20	22	26		68/225

Hole Ref CPT 44A

Depth	Blows per 75mm				SPT N
0.00-0.30	0	1	1	2	4
0.30-0.60	4	4	3	1	12
0.60-0.90	2	2	6	10	20
0.90-1.20	27	15	12	50	104
1.20-1.50	15	15	14	10	54
1.50-1.67	21	29	10		60/170

Hole Ref CPT 45

Depth	Blows per 75mm				SPT N
0.00-0.30	1	1	1	6	9
0.30-0.60	6	5	4	4	19
0.60-0.90	4	3	4	3	14
0.90-1.20	4	3	3	2	12
1.20-1.50	2	2	4	4	12
1.50-1.80	7	7	6	7	27
1.80-2.10	6	7	3	4	20
2.10-2.40	4	3	3	2	12
2.40-2.70	2	4	6	9	21
2.70-3.00	8	9	8	10	35
3.00-3.30	10	9	8	9	36

Hole Ref CPT 46

Depth	Blows per 75mm				SPT N
0.00-0.30	1	2	2	2	7
0.30-0.60	2	3	4	4	13
0.60-0.90	4	3	3	4	14
0.90-1.20	7	10	16	12	45
1.20-1.50	11	11	15	13	50
1.50-1.80	12	15	10	11	48
1.80-2.05	13	17	15	5	50/245

Hole Ref CPT 47

Depth	Blows per 75mm				SPT N
0.00-0.30	1	1	1	1	4
0.30-0.60	1	1	1	1	4
0.60-0.90	2	7	5	4	18
0.90-1.20	10	15	15	10	50
1.20-1.50	7	10	12	20	49
1.50-1.80	10	15	12	15	52
1.80-2.10	12	13	10	8	43
2.10-2.40	7	4	3	6	20
2.40-2.70	4	3	6	4	17
2.70-3.00	5	5	3	4	17
3.00-3.30	4	3	5	4	16

Hole Ref CPT 48

Depth	Blows per 75mm				SPT N
0.00-0.30	1	1	1	2	5
0.30-0.60	2	3	1	2	8
0.60-0.90	2	2	2	2	8
0.90-1.20	2	1	3	6	12
1.20-1.50	5	4	4	6	19
1.50-1.80	7	10	10	12	39
1.80-2.10	10	10	9	8	37
2.10-2.40	7	7	4	3	21
2.40-2.70	2	3	3	4	12
2.70-3.00	7	6	5	5	23
3.00-3.30	3	4	7	10	24

Hole Ref

Depth	Blows per 75mm				SPT N

Hole Ref

Depth	Blows per 75mm				SPT N

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date: 06.09.18**

Hole Ref CPT 56

Depth	Blows per 75mm				SPT N
0.00-0.30	3	3	6	3	15
0.30-0.60	5	8	5	3	21
0.60-0.90	5	6	4	5	20
0.90-1.20	4	3	4	3	14
1.20-1.50	2	3	2	1	8
1.50-1.80	2	2	2	2	8
1.80-2.10	2	1	1	1	5
2.10-2.40	1	2	3	5	11
2.40-2.69	6	8	15	21	50/285

Hole Ref CPT 57

Depth	Blows per 75mm				SPT N
0.00-0.30	2	2	2	2	8
0.30-0.60	1	2	2	3	8
0.60-0.90	2	3	2	3	10
0.90-1.20	2	5	2	3	12
1.20-1.50	3	4	4	4	15
1.50-1.80	3	4	5	4	16
1.80-2.10	4	3	3	3	13
2.10-2.40	4	5	5	4	18
2.40-2.70	2	2	5	5	14
2.70-2.98	5	5	17	23	50/275

Hole Ref CPT 58

Depth	Blows per 75mm				SPT N
0.00-0.30	2	3	6	4	15
0.30-0.60	3	2	2	3	10
0.60-0.90	2	3	2	3	10
0.90-1.20	3	3	4	8	18
1.20-1.50	7	6	5	8	26
1.50-1.73	9	14	13	13	49
1.80-2.10	10	8	8	7	33
2.10-2.40	9	10	14	10	43
2.40-2.70	11	10	7	9	37
2.70-2.96	10	6	6	28	50/255

Hole Ref CPT 59

Depth	Blows per 75mm				SPT N
0.00-0.30	3	2	2	1	8
0.30-0.60	1	2	2	2	7
0.60-0.90	2	3	2	2	9
0.90-1.20	2	2	2	6	12
1.20-1.50	3	3	5	7	18
1.50-1.80	7	6	4	5	22
1.80-2.10	2	3	2	2	9
2.10-2.40	5	9	6	12	32
2.40-2.70	10	8	5	4	27
2.70-3.00	4	4	5	8	21
3.00-3.30	12	11	10	10	43

Hole Ref CPT 60

Depth	Blows per 75mm				SPT N
0.00-0.30	2	3	4	3	12
0.30-0.60	3	3	3	2	11
0.60-0.90	2	3	3	2	10
0.90-1.20	2	2	2	3	9
1.20-1.50	4	5	4	3	16
1.50-1.80	3	4	5	5	17
1.80-2.10	7	4	4	4	19
2.10-2.40	5	5	6	8	24
2.40-2.70	8	6	7	7	28
2.70-3.00	5	7	8	7	27
3.00-3.30	8	5	5	4	22

Hole Ref CPT 61

Depth	Blows per 75mm				SPT N
0.00-0.30	3	3	6	3	15
0.30-0.60	5	8	5	3	21
0.60-0.90	5	6	4	5	20
0.90-1.20	4	3	4	3	14
1.20-1.50	2	3	2	1	8
1.50-1.80	2	2	2	2	8
1.80-2.10	2	1	1	1	5
2.10-2.40	1	2	3	5	11
2.40-2.69	6	8	15	21	50/285

SOUTHERN GROUND TESTING - Continouous CPT

CONTRACT: Merthyr Vale **Date: 06.09.18**

Hole Ref CPT 49

Depth	Blows per 75mm				SPT N
0.00-0.30	2	3	2	2	9
0.30-0.60	7	3	3	3	16
0.60-0.90	4	5	4	5	18
0.90-1.20	4	4	4	4	16
1.20-1.50	5	5	6	8	24
1.50-1.80	8	8	7	12	35
1.80-2.10	11	12	10	12	45
2.10-2.28	10	15	25		50/180

Hole Ref CPT 50

Depth	Blows per 75mm				SPT N
0.00-0.30	1	2	7	6	16
0.30-0.60	5	4	4	4	17
0.60-0.90	3	5	7	4	19
0.90-1.20	4	4	3	2	13
1.20-1.50	2	1	2	7	12
1.50-1.80	14	15	14	12	55
1.80-2.10	9	10	7	5	31
2.10-2.40	7	6	4	3	20
2.40-2.70	2	2	3	3	10
2.70-3.00	2	3	3	3	11
3.00-3.30	4	12	12	8	36

Hole Ref CPT 51

Depth	Blows per 75mm				SPT N
0.00-0.30	1	1	2	3	7
0.30-0.60	4	3	2	3	12
0.60-0.90	2	3	4	6	15
0.90-1.20	3	10	10	10	33
1.20-1.50	9	10	12	20	51
1.50-1.73	12	15	38		65/225

Hole Ref CPT 51A

Depth	Blows per 75mm				SPT N
0.00-0.30	1	1	2	2	6
0.30-0.60	3	4	3	4	14
0.60-0.90	2	3	2	3	10
0.90-1.20	3	6	8	8	25
1.20-1.50	47	6	5	7	65
1.50-1.80	10	8	8	7	33
1.80-2.10	9	11	10	6	36
2.10-2.40	6	6	8	4	24
2.40-2.51	31	19			50/105

Hole Ref CPT 52

Depth	Blows per 75mm				SPT N
0.00-0.30	1	3	3	2	9
0.30-0.60	3	2	3	3	11
0.60-0.90	2	3	3	5	13
0.90-1.20	7	8	8	5	28
1.20-1.50	11	10	8	6	35
1.50-1.80	12	13	6	7	38
1.80-2.10	7	7	6	5	25
2.10-2.40	6	5	8	8	27
2.40-2.70	12	10	9	7	38
2.70-3.00	5	5	4	2	16
3.00-3.30	2	2	2	2	8

Hole Ref CPT 53

Depth	Blows per 75mm				SPT N
0.00-0.30	2	7	10	3	22
0.30-0.60	3	3	2	3	11
0.60-0.90	2	3	8	5	18
0.90-1.20	3	5	5	8	21
1.20-1.50	4	10	14	14	42
1.50-1.80	1	1	8	9	19
1.80-2.10	6	5	5	4	20
2.10-2.40	5	5	7	9	26
2.40-2.66	9	10	13	18	50/255

Hole Ref CPT 54

Depth	Blows per 75mm				SPT N
0.00-0.30	2	6	4	3	15
0.30-0.60	2	2	2	3	9
0.60-0.90	5	6	13	12	36
0.90-1.20	7	6	4	4	21
1.20-1.50	3	2	3	4	12
1.50-1.80	4	2	3	4	13
1.80-2.10	5	9	10	19	43
2.10-2.20	20	30			50/95

Hole Ref CPT 55

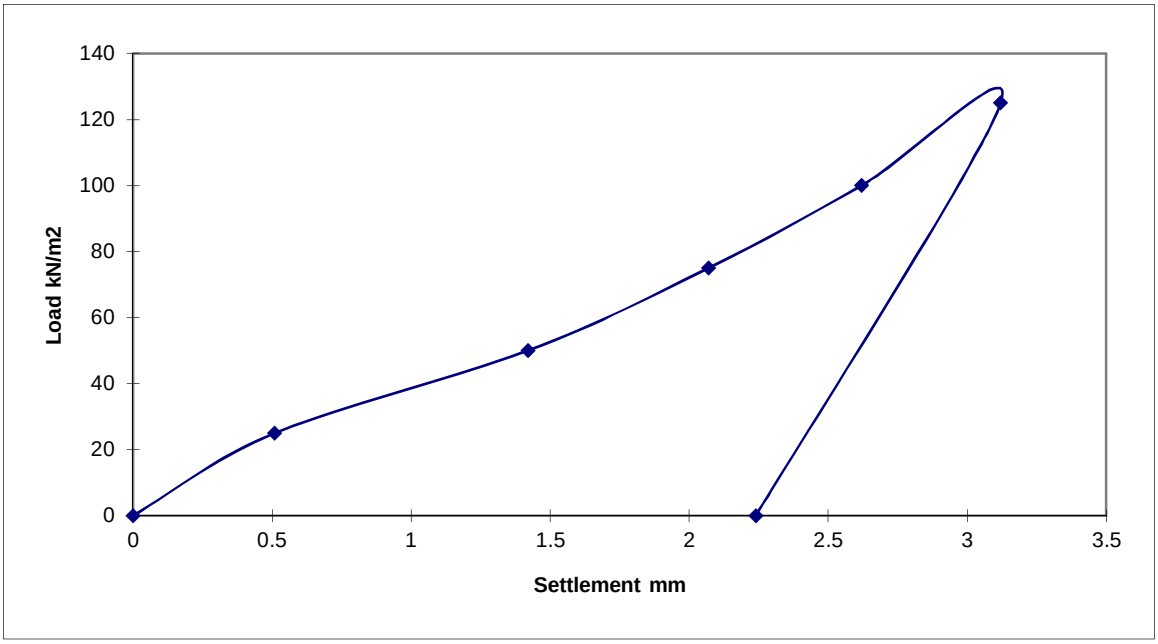
Depth	Blows per 75mm				SPT N
0.00-0.30	2	2	2	3	9
0.30-0.60	3	3	4	4	14
0.60-0.90	4	4	7	8	23
0.90-1.20	9	8	10	8	35
1.20-1.50	9	10	7	5	31
1.50-1.80	4	3	4	3	14
1.80-2.10	3	2	3	1	9
2.10-2.40	2	2	1	1	6
2.40-2.70	2	2	2	3	9
2.70-3.00	6	5	4	3	18
3.00-3.30	3	4	4	4	15

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P100	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.51	25	4
1.42	50	8
2.07	75	12
2.62	100	16
3.12	125	20
2.24	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 03.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

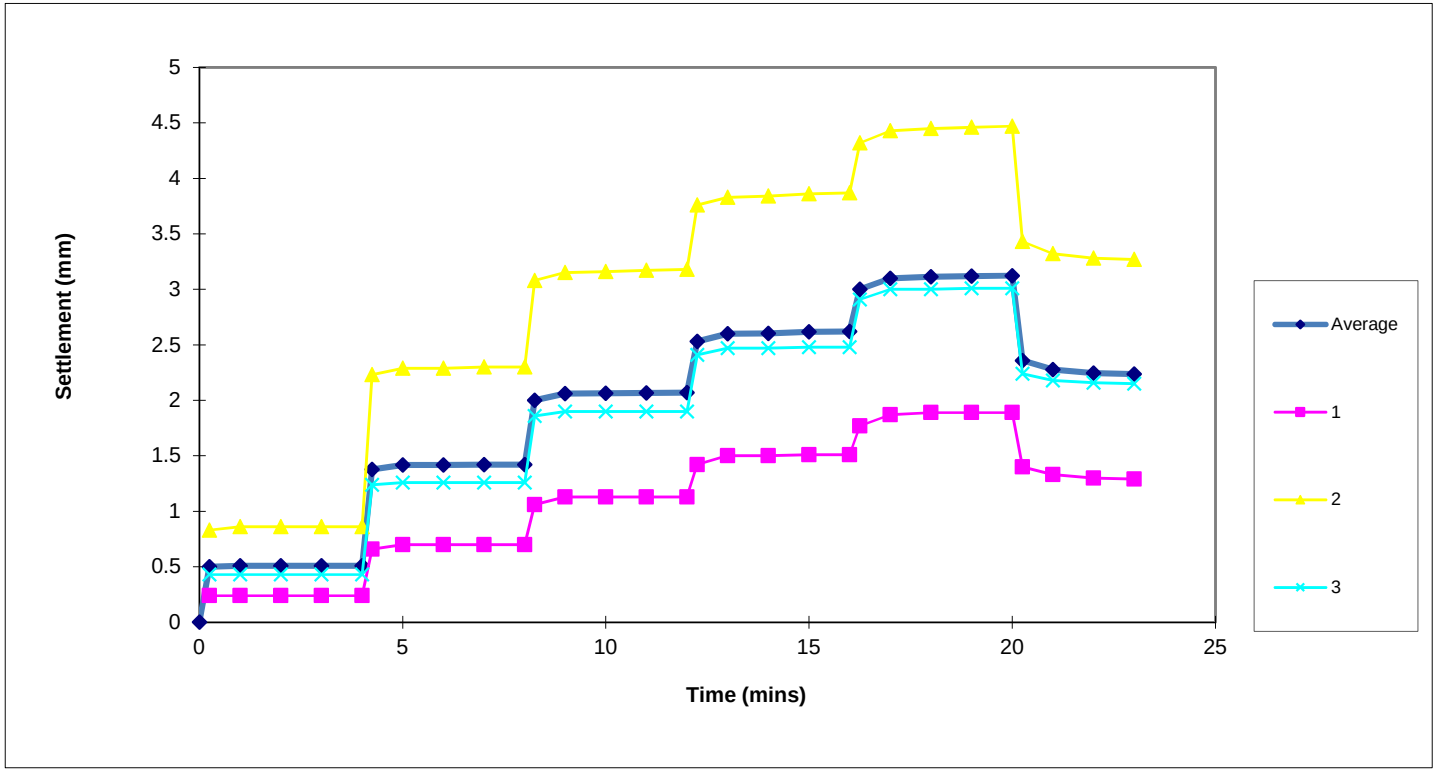
Contract: Merthyr Vale | Date: 03.08.18

Test Reference: P100 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.24	0.83	0.43	0.50
	1	0.24	0.86	0.43	0.51
	2	0.24	0.86	0.43	0.51
	3	0.24	0.86	0.43	0.51
	4	0.24	0.86	0.43	0.51
50kN/m^2 Load	4.25	0.66	2.23	1.24	1.38
	5	0.70	2.29	1.26	1.42
	6	0.70	2.29	1.26	1.42
	7	0.70	2.30	1.26	1.42
	8	0.70	2.30	1.26	1.42
75kN/m^2 Load	8.25	1.06	3.08	1.86	2.00
	9	1.13	3.15	1.90	2.06
	10	1.13	3.16	1.90	2.06
	11	1.13	3.17	1.90	2.07
	12	1.13	3.18	1.90	2.07
100kN/m^2 Load	12.25	1.42	3.76	2.41	2.53
	13	1.50	3.83	2.47	2.60
	14	1.50	3.84	2.47	2.60
	15	1.51	3.86	2.48	2.62
	16	1.51	3.87	2.48	2.62
125kN/m^2 Load	16.25	1.77	4.32	2.91	3.00
	17	1.87	4.43	3.00	3.10
	18	1.89	4.45	3.00	3.11
	19	1.89	4.46	3.01	3.12
	20	1.89	4.47	3.01	3.12
0kN/m^2 Unload	20.25	1.40	3.43	2.24	2.36
	21	1.33	3.32	2.18	2.28
	22	1.30	3.28	2.16	2.25
	23	1.29	3.27	2.15	2.24

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P100



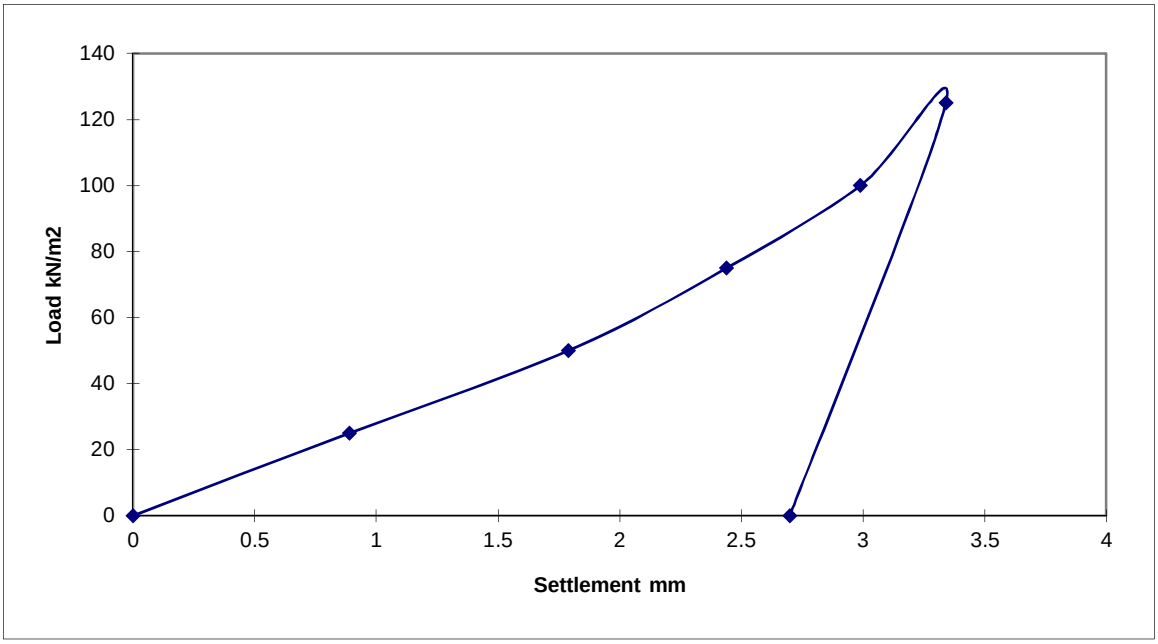
Contract: Merthyr Vale	Date: 03.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P101	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.89	25	4
1.79	50	8
2.44	75	12
2.99	100	16
3.34	125	20
2.70	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 03.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

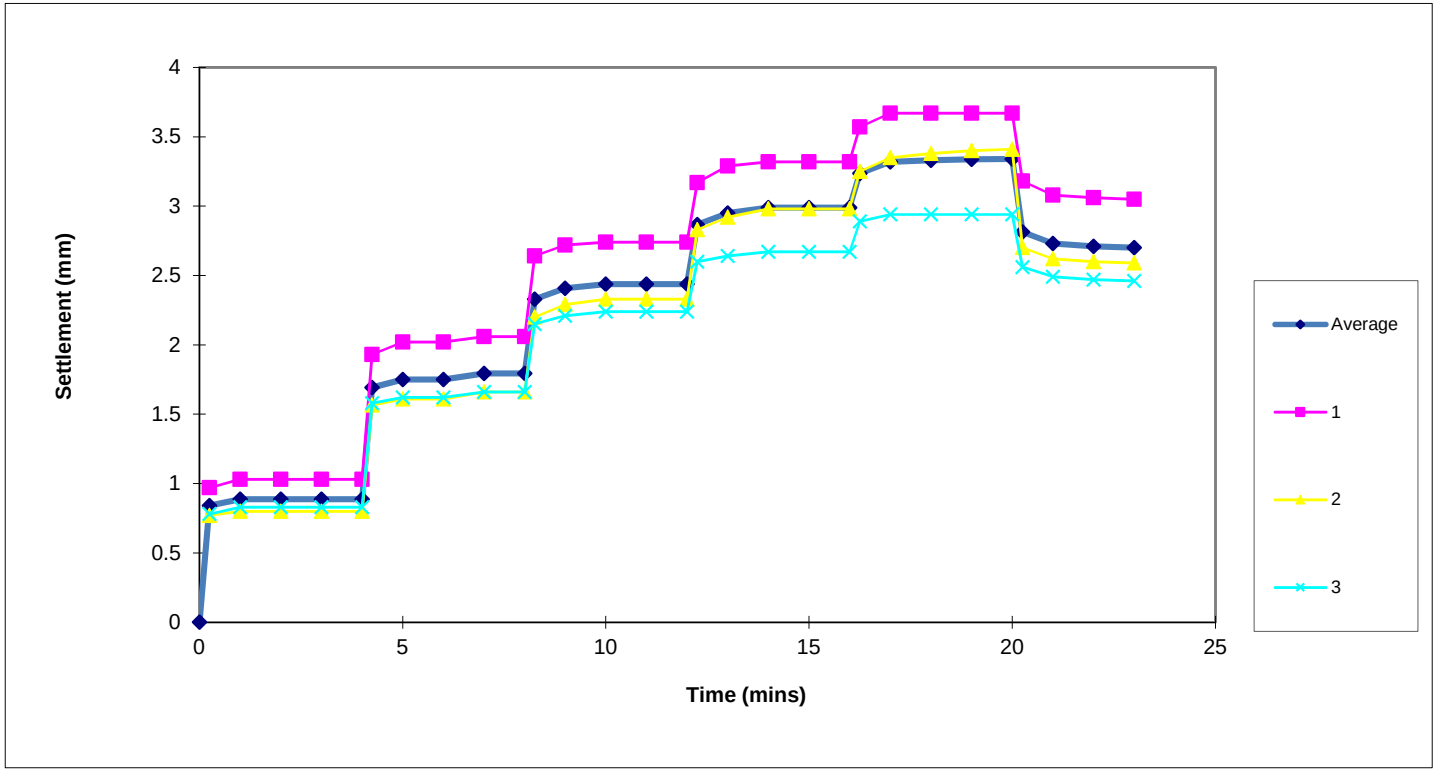
Contract: Merthyr Vale | Date: 03.08.18

Test Reference: P101 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.97	0.77	0.78	0.84
	1	1.03	0.80	0.83	0.89
	2	1.03	0.80	0.83	0.89
	3	1.03	0.80	0.83	0.89
	4	1.03	0.80	0.83	0.89
50kN/m^2 Load	4.25	1.93	1.57	1.58	1.69
	5	2.02	1.61	1.62	1.75
	6	2.02	1.61	1.62	1.75
	7	2.06	1.66	1.66	1.79
	8	2.06	1.66	1.66	1.79
75kN/m^2 Load	8.25	2.64	2.20	2.15	2.33
	9	2.72	2.29	2.21	2.41
	10	2.74	2.33	2.24	2.44
	11	2.74	2.33	2.24	2.44
	12	2.74	2.33	2.24	2.44
100kN/m^2 Load	12.25	3.17	2.83	2.60	2.87
	13	3.29	2.92	2.64	2.95
	14	3.32	2.98	2.67	2.99
	15	3.32	2.98	2.67	2.99
	16	3.32	2.98	2.67	2.99
125kN/m^2 Load	16.25	3.57	3.25	2.89	3.24
	17	3.67	3.35	2.94	3.32
	18	3.67	3.38	2.94	3.33
	19	3.67	3.40	2.94	3.34
	20	3.67	3.41	2.94	3.34
0kN/m^2 Unload	20.25	3.18	2.70	2.56	2.81
	21	3.08	2.62	2.49	2.73
	22	3.06	2.60	2.47	2.71
	23	3.05	2.59	2.46	2.70

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P101



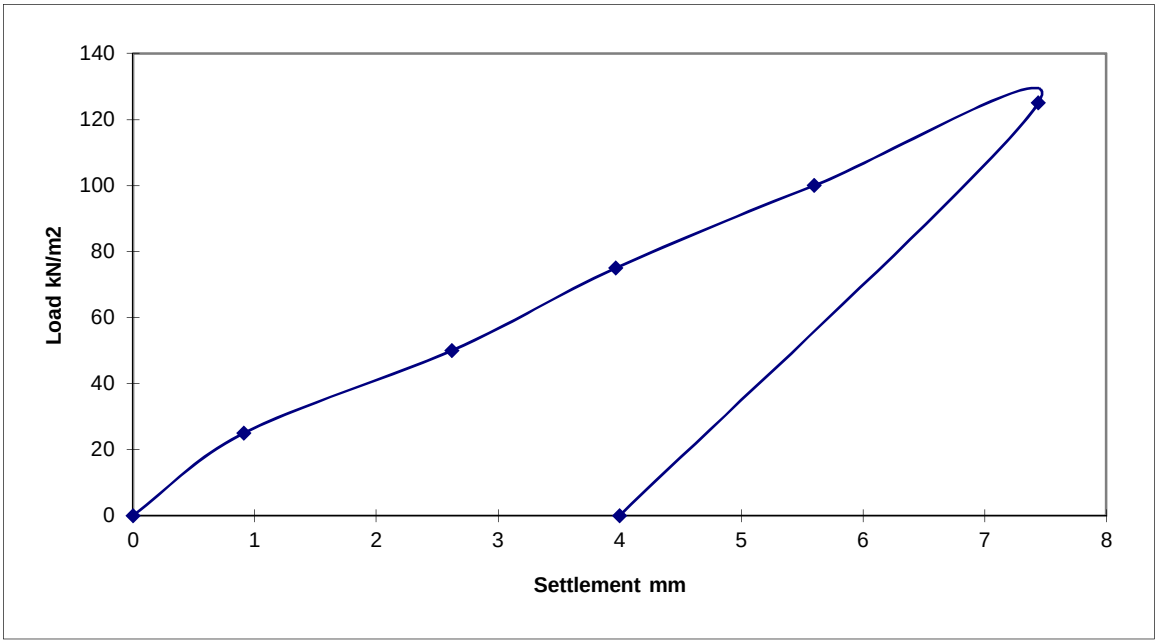
Contract: Merthyr Vale	Date: 03.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P102	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.91	25	4
2.62	50	8
3.97	75	12
5.60	100	16
7.44	125	20
4.00	0	24



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 03.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

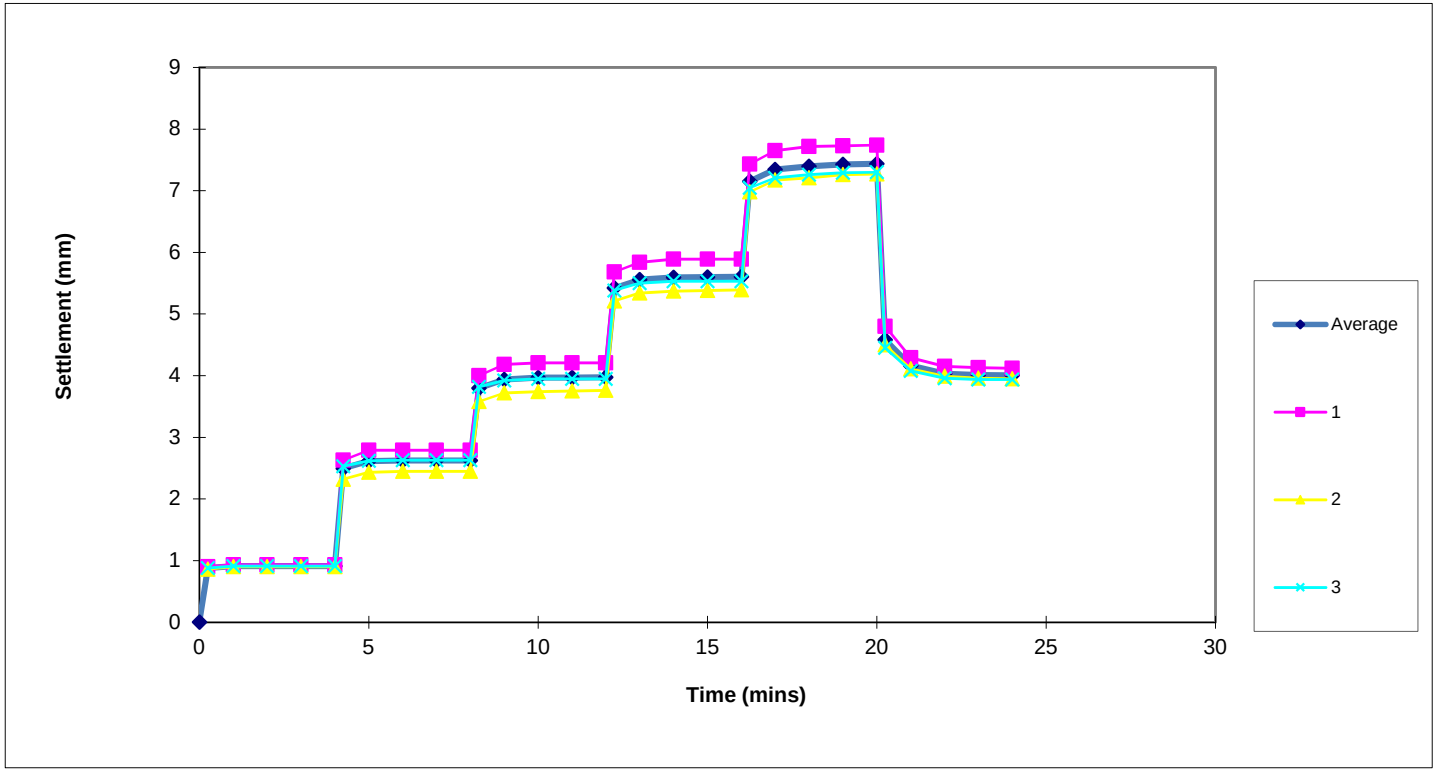
Contract: Merthyr Vale | Date: 03.08.18

Test Reference: P102 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.90	0.86	0.88	0.88
	1	0.93	0.90	0.91	0.91
	2	0.93	0.90	0.91	0.91
	3	0.93	0.90	0.91	0.91
	4	0.93	0.90	0.91	0.91
50kN/m^2 Load	4.25	2.63	2.32	2.53	2.49
	5	2.79	2.43	2.62	2.61
	6	2.79	2.45	2.63	2.62
	7	2.79	2.45	2.63	2.62
	8	2.79	2.45	2.63	2.62
75kN/m^2 Load	8.25	4.00	3.58	3.82	3.80
	9	4.18	3.72	3.92	3.94
	10	4.21	3.74	3.95	3.97
	11	4.21	3.75	3.95	3.97
	12	4.21	3.76	3.95	3.97
100kN/m^2 Load	12.25	5.68	5.21	5.38	5.42
	13	5.84	5.34	5.50	5.56
	14	5.89	5.37	5.53	5.60
	15	5.89	5.38	5.53	5.60
	16	5.89	5.39	5.53	5.60
125kN/m^2 Load	16.25	7.43	6.98	7.05	7.15
	17	7.65	7.17	7.21	7.34
	18	7.72	7.21	7.26	7.40
	19	7.73	7.26	7.29	7.43
	20	7.74	7.27	7.30	7.44
0kN/m^2 Unload	20.25	4.80	4.50	4.45	4.58
	21	4.29	4.11	4.08	4.16
	22	4.15	3.99	3.96	4.03
	23	4.13	3.96	3.94	4.01
	24	4.12	3.95	3.94	4.00

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P102



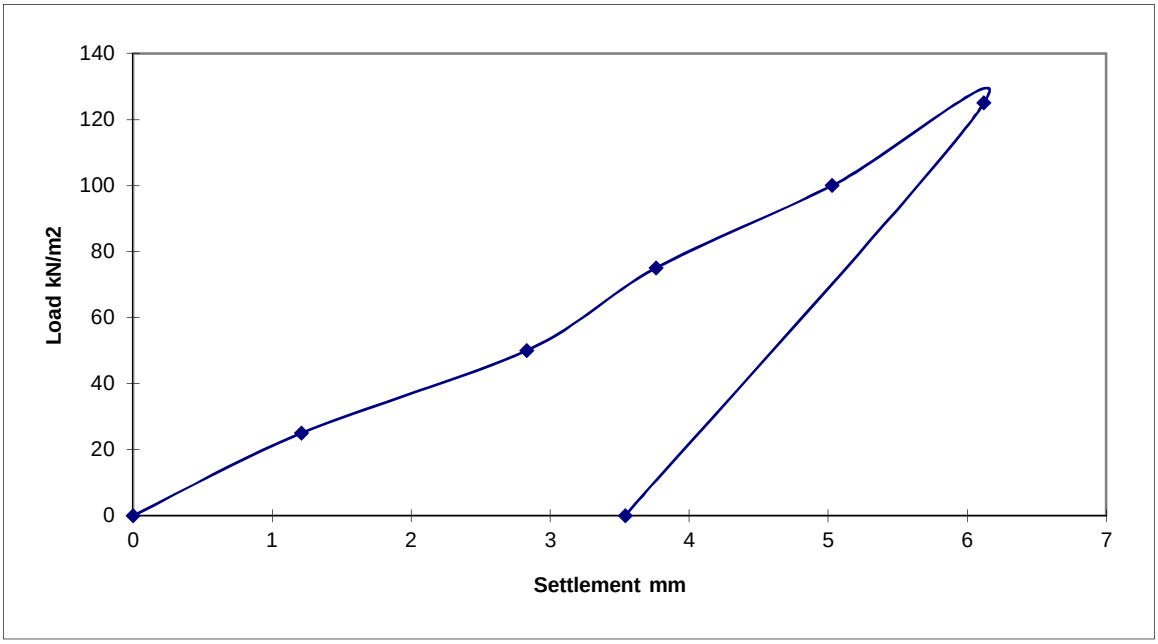
Contract: Merthyr Vale	Date: 03.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P103	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.21	25	4
2.83	50	8
3.76	75	12
5.03	100	16
6.12	125	20
3.54	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale

Date: 03.08.18
Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

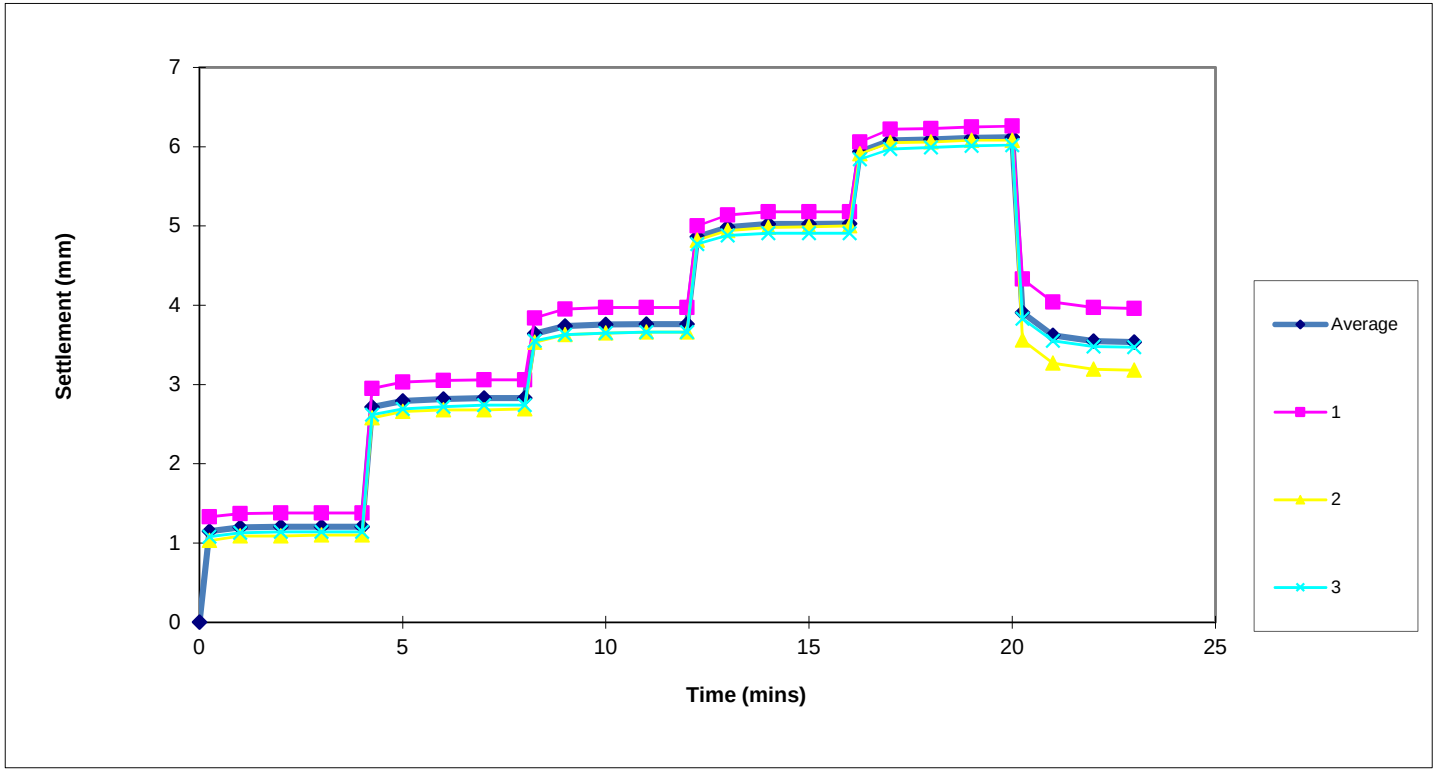
Contract: Merthyr Vale | Date: 03.08.18

Test Reference: P103 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	1.33	1.03	1.08	1.15
	1	1.37	1.09	1.13	1.20
	2	1.38	1.09	1.14	1.20
	3	1.38	1.10	1.14	1.21
	4	1.38	1.10	1.14	1.21
50kN/m^2 Load	4.25	2.95	2.58	2.62	2.72
	5	3.03	2.66	2.69	2.79
	6	3.05	2.68	2.72	2.82
	7	3.06	2.68	2.74	2.83
	8	3.06	2.69	2.74	2.83
75kN/m^2 Load	8.25	3.84	3.53	3.55	3.64
	9	3.95	3.63	3.63	3.74
	10	3.97	3.65	3.65	3.76
	11	3.97	3.66	3.66	3.76
	12	3.97	3.66	3.66	3.76
100kN/m^2 Load	12.25	5.00	4.82	4.77	4.86
	13	5.14	4.94	4.88	4.99
	14	5.18	4.98	4.91	5.02
	15	5.18	4.99	4.91	5.03
	16	5.18	5.00	4.91	5.03
125kN/m^2 Load	16.25	6.06	5.91	5.84	5.94
	17	6.22	6.05	5.97	6.08
	18	6.23	6.06	5.99	6.09
	19	6.25	6.08	6.01	6.11
	20	6.26	6.08	6.02	6.12
0kN/m^2 Unload	20.25	4.33	3.56	3.83	3.91
	21	4.04	3.27	3.55	3.62
	22	3.97	3.19	3.48	3.55
	23	3.96	3.18	3.47	3.54

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P103



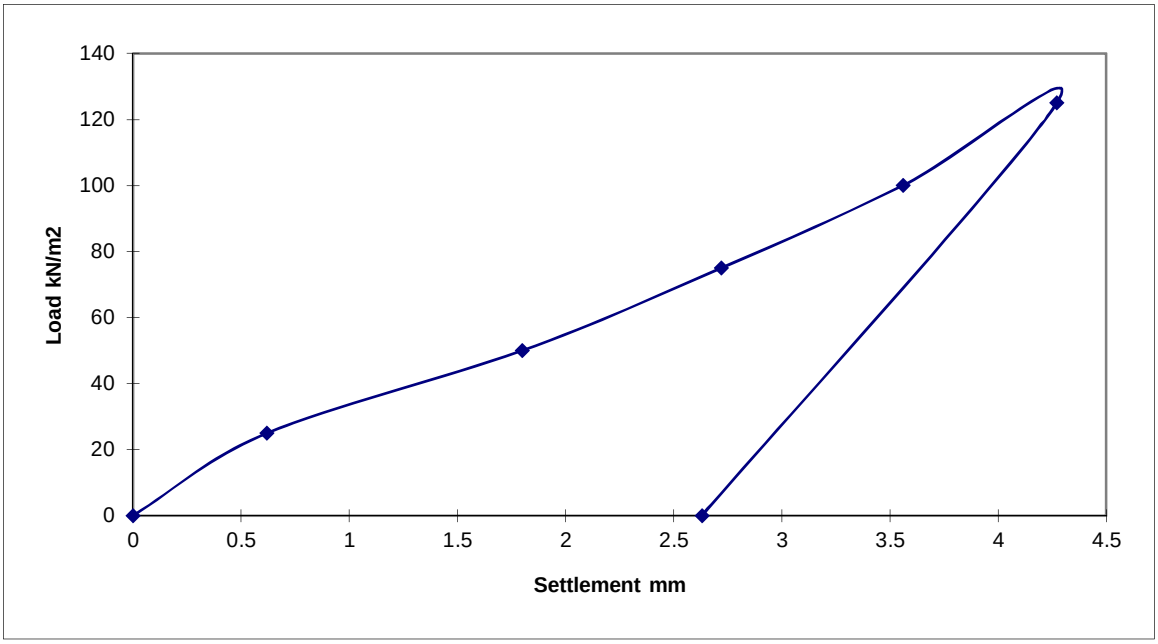
Contract: Merthyr Vale	Date: 03.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P104	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.62	25	4
1.80	50	8
2.72	75	12
3.56	100	16
4.27	125	20
2.63	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 03.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

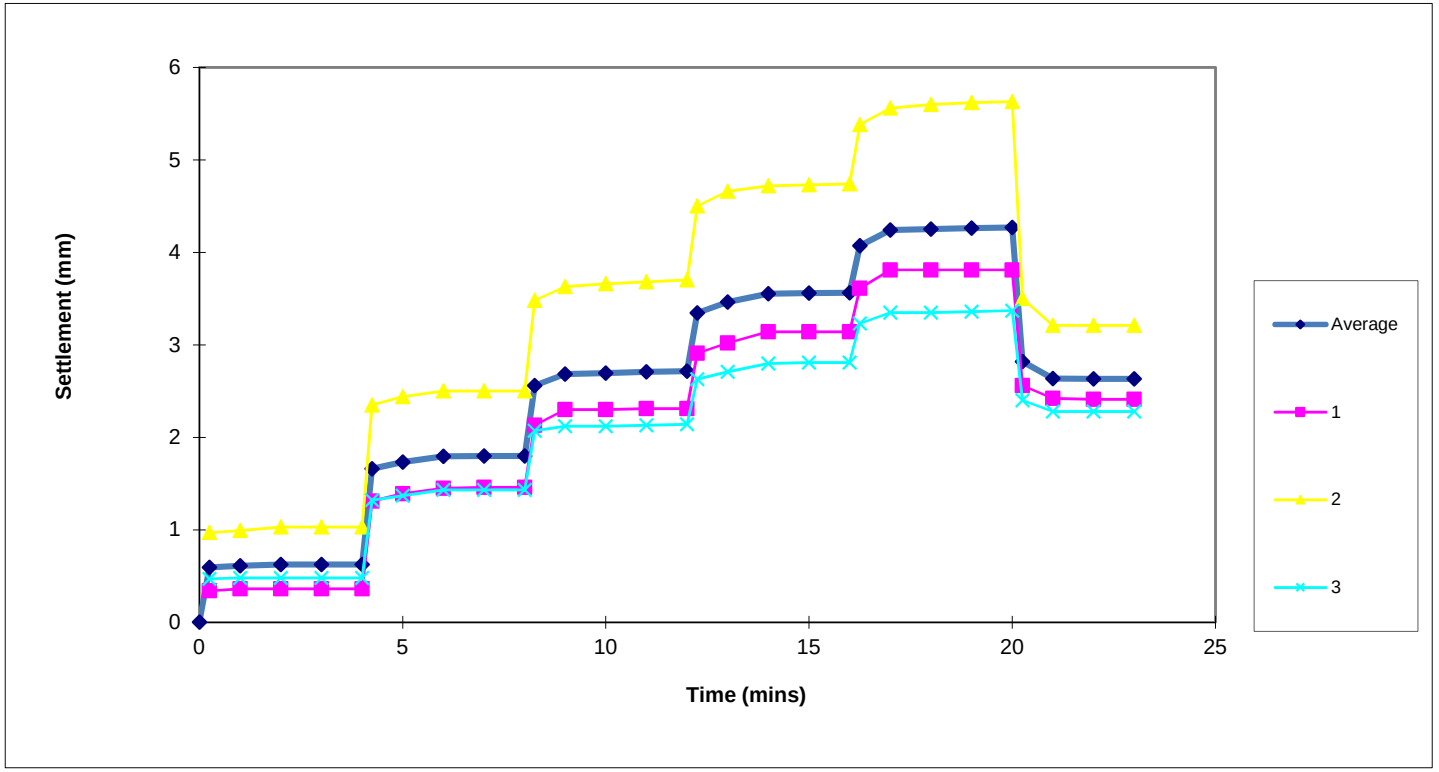
Contract: Merthyr Vale | Date: 03.08.18

Test Reference: P104 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.34	0.97	0.47	0.59
	1	0.36	0.99	0.48	0.61
	2	0.36	1.03	0.48	0.62
	3	0.36	1.03	0.48	0.62
	4	0.36	1.03	0.48	0.62
50kN/m^2 Load	4.25	1.31	2.35	1.32	1.66
	5	1.39	2.44	1.37	1.73
	6	1.45	2.50	1.43	1.79
	7	1.46	2.50	1.43	1.80
	8	1.46	2.50	1.43	1.80
75kN/m^2 Load	8.25	2.13	3.48	2.07	2.56
	9	2.30	3.63	2.12	2.68
	10	2.30	3.66	2.12	2.69
	11	2.31	3.68	2.13	2.71
	12	2.31	3.70	2.14	2.72
100kN/m^2 Load	12.25	2.91	4.50	2.63	3.35
	13	3.02	4.66	2.71	3.46
	14	3.14	4.72	2.80	3.55
	15	3.14	4.73	2.81	3.56
	16	3.14	4.74	2.81	3.56
125kN/m^2 Load	16.25	3.61	5.38	3.23	4.07
	17	3.81	5.56	3.35	4.24
	18	3.81	5.60	3.35	4.25
	19	3.81	5.62	3.36	4.26
	20	3.81	5.63	3.37	4.27
0kN/m^2 Unload	20.25	2.56	3.50	2.40	2.82
	21	2.42	3.21	2.28	2.64
	22	2.41	3.21	2.28	2.63
	23	2.41	3.21	2.28	2.63

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P104



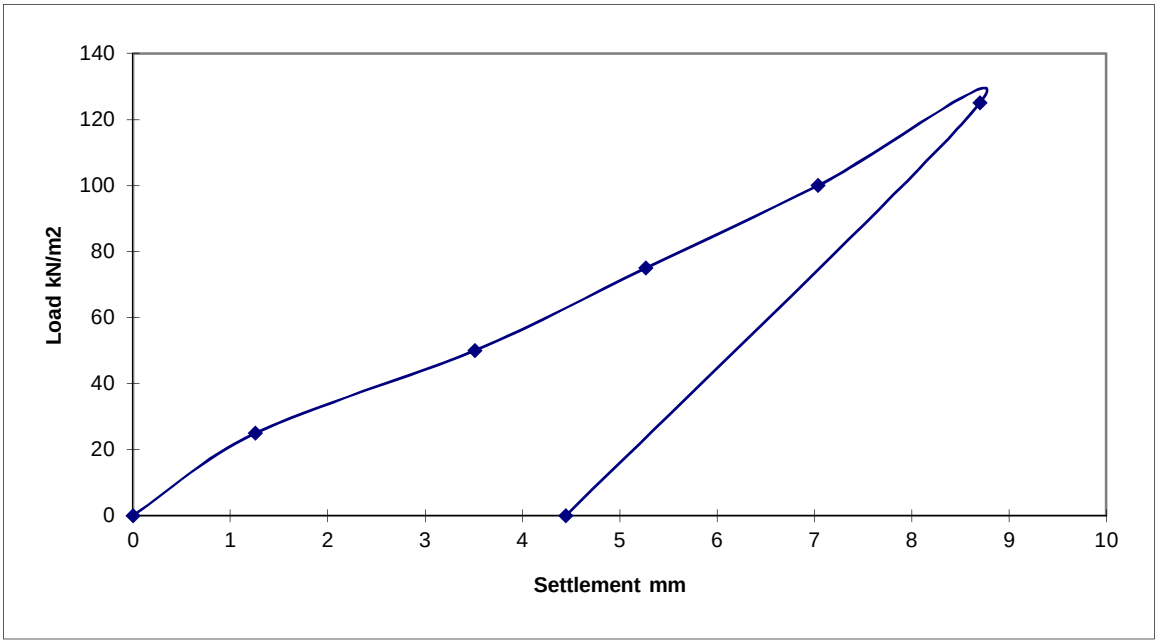
Contract: Merthyr Vale	Date: 03.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P105	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.26	25	4
3.51	50	8
5.27	75	12
7.04	100	16
8.70	125	20
4.45	0	24



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 03.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

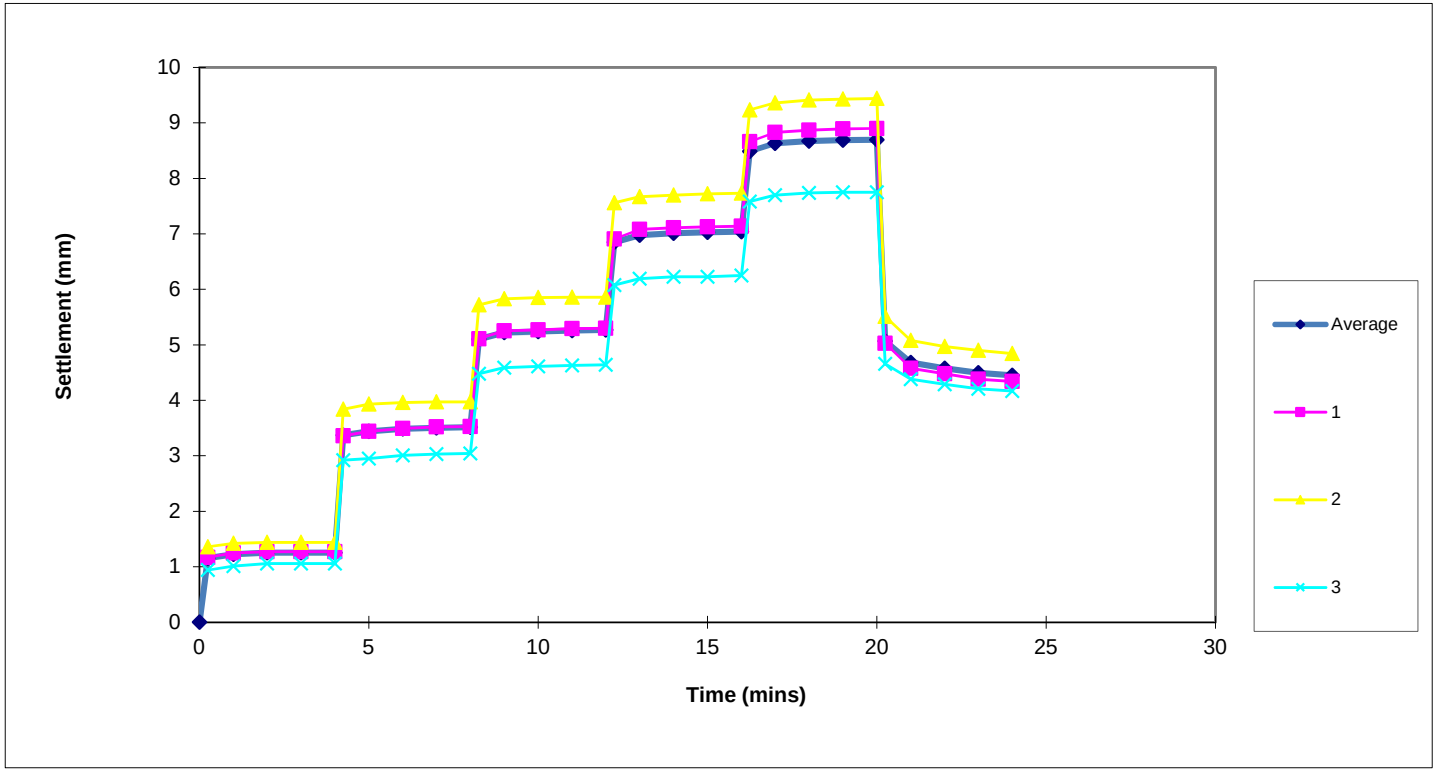
Contract: Merthyr Vale | Date: 03.08.18

Test Reference: P105 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	1.17	1.36	0.94	1.16
	1	1.25	1.42	1.01	1.23
	2	1.27	1.44	1.06	1.26
	3	1.27	1.44	1.06	1.26
	4	1.27	1.44	1.06	1.26
50kN/m^2 Load	4.25	3.36	3.84	2.92	3.37
	5	3.44	3.93	2.95	3.44
	6	3.49	3.96	3.01	3.49
	7	3.52	3.97	3.03	3.51
	8	3.53	3.97	3.04	3.51
75kN/m^2 Load	8.25	5.11	5.72	4.48	5.10
	9	5.25	5.83	4.59	5.22
	10	5.27	5.85	4.61	5.24
	11	5.29	5.86	4.63	5.26
	12	5.30	5.86	4.64	5.27
100kN/m^2 Load	12.25	6.91	7.56	6.08	6.85
	13	7.08	7.67	6.19	6.98
	14	7.11	7.70	6.23	7.01
	15	7.13	7.72	6.23	7.03
	16	7.14	7.73	6.25	7.04
125kN/m^2 Load	16.25	8.66	9.23	7.58	8.49
	17	8.83	9.36	7.70	8.63
	18	8.87	9.41	7.74	8.67
	19	8.89	9.43	7.75	8.69
	20	8.90	9.44	7.75	8.70
0kN/m^2 Unload	20.25	5.03	5.51	4.66	5.07
	21	4.58	5.08	4.38	4.68
	22	4.48	4.97	4.29	4.58
	23	4.38	4.90	4.21	4.50
	24	4.34	4.84	4.17	4.45

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P105



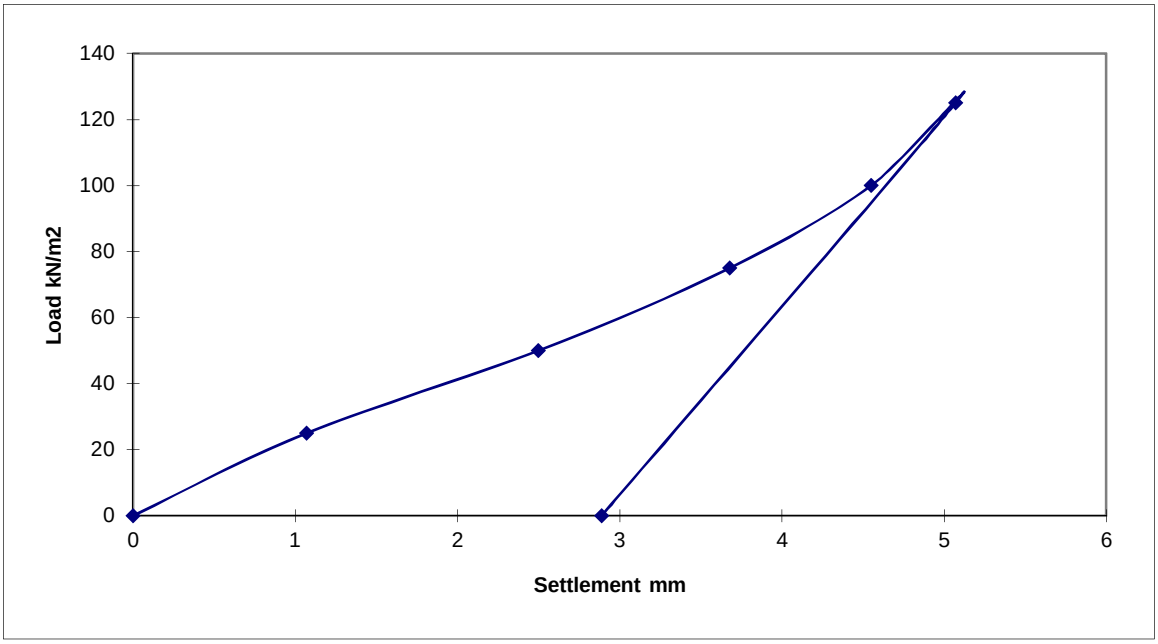
Contract: Merthyr Vale	Date: 03.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P106	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.07	25	4
2.50	50	8
3.68	75	12
4.55	100	16
5.07	125	20
2.89	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 03.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

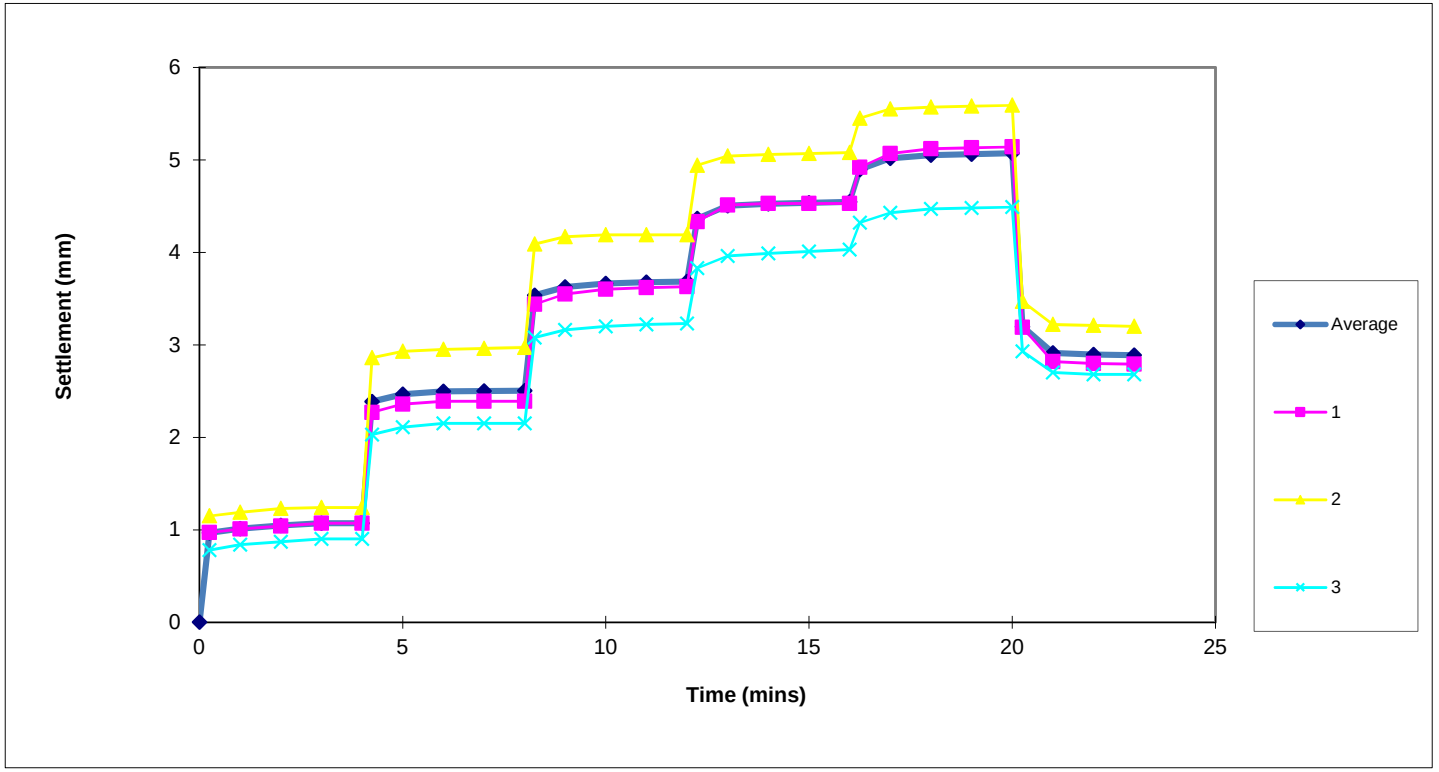
Contract: Merthyr Vale | Date: 03.08.18

Test Reference: P106 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2	0				0
Load	0.25	0.97	1.15	0.78	0.97
	1	1.01	1.19	0.84	1.01
	2	1.04	1.23	0.87	1.05
	3	1.07	1.24	0.90	1.07
	4	1.07	1.24	0.90	1.07
50kN/m^2	4.25	2.27	2.86	2.03	2.39
Load	5	2.36	2.93	2.11	2.47
	6	2.39	2.95	2.15	2.50
	7	2.39	2.96	2.15	2.50
	8	2.39	2.97	2.15	2.50
75kN/m^2	8.25	3.44	4.09	3.08	3.54
Load	9	3.55	4.17	3.16	3.63
	10	3.60	4.19	3.20	3.66
	11	3.62	4.19	3.22	3.68
	12	3.63	4.19	3.23	3.68
100kN/m^2	12.25	4.33	4.94	3.83	4.37
Load	13	4.51	5.04	3.96	4.50
	14	4.53	5.06	3.99	4.53
	15	4.53	5.07	4.01	4.54
	16	4.53	5.08	4.03	4.55
125kN/m^2	16.25	4.92	5.45	4.32	4.90
Load	17	5.07	5.55	4.43	5.02
	18	5.12	5.57	4.47	5.05
	19	5.13	5.58	4.48	5.06
	20	5.14	5.59	4.49	5.07
0kN/m^2	20.25	3.19	3.47	2.93	3.20
Unload	21	2.82	3.22	2.70	2.91
	22	2.80	3.21	2.68	2.90
	23	2.79	3.20	2.68	2.89

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P106



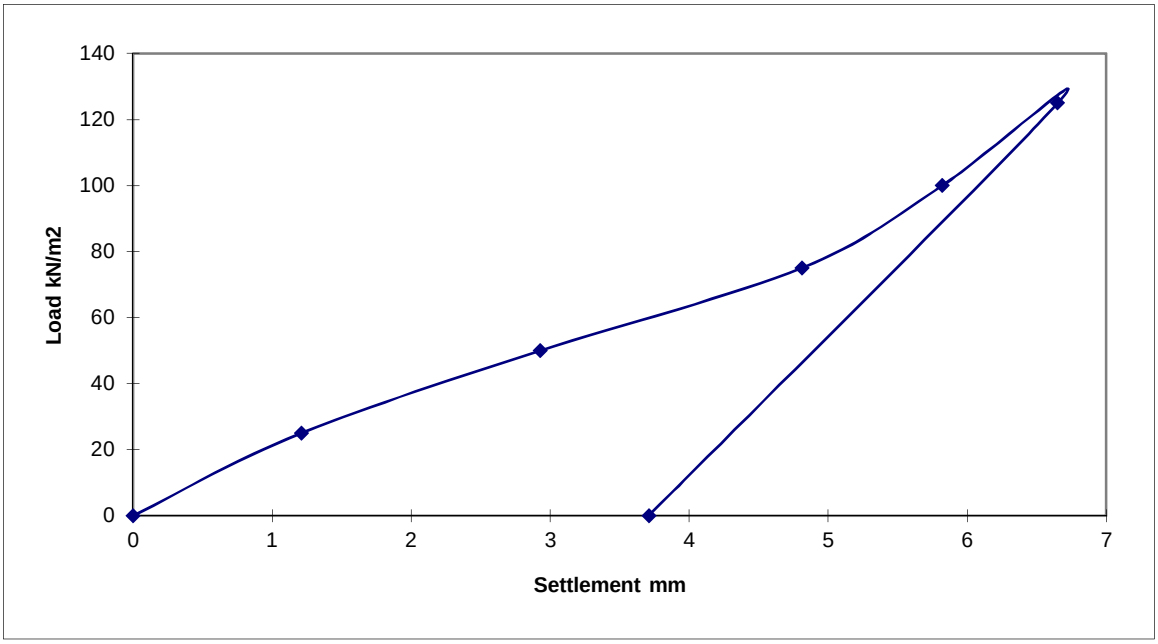
Contract: Merthyr Vale	Date: 03.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P107	Surface	600mm	Compacted fine to medium grey gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.21	25	4
2.93	50	8
4.81	75	12
5.82	100	16
6.65	125	20
3.71	0	24



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 0o.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

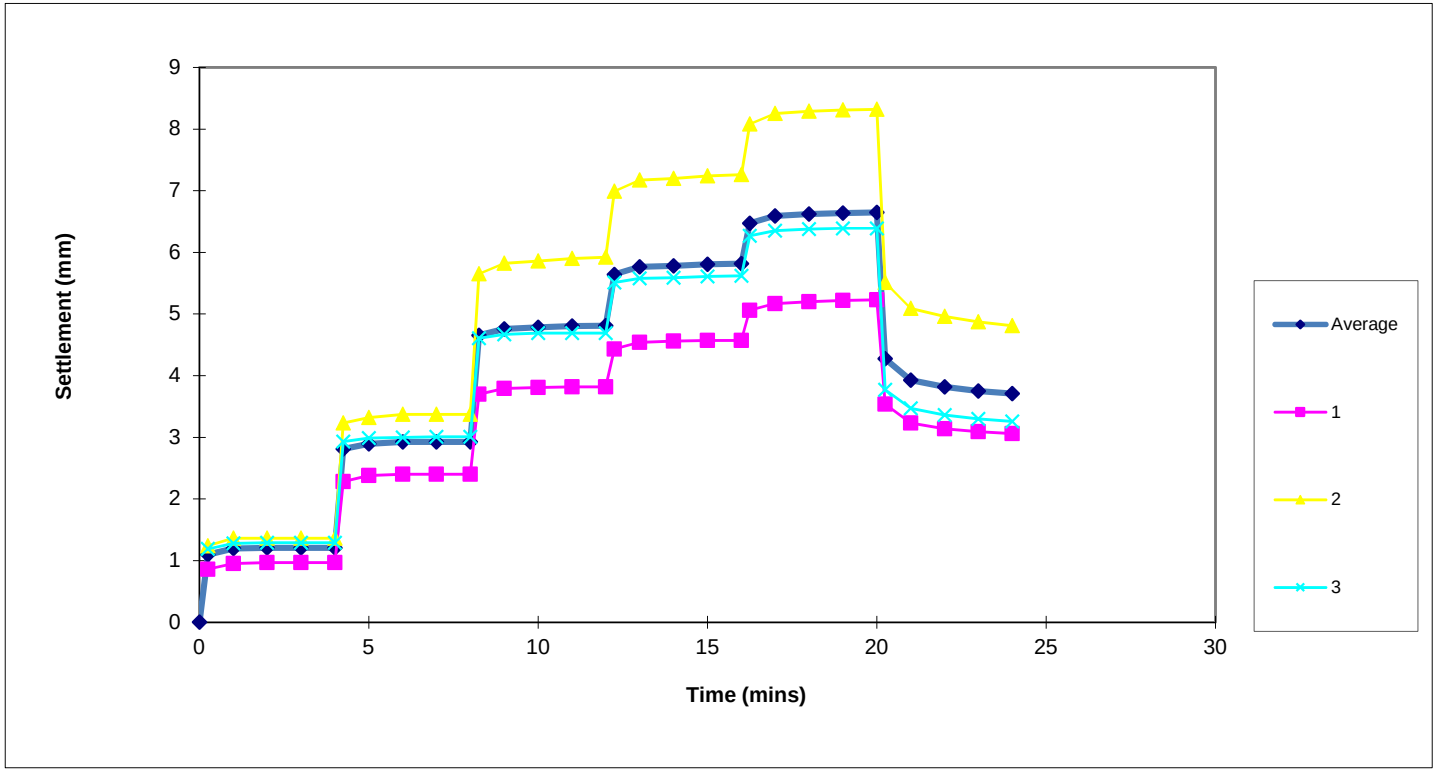
Contract: Merthyr Vale | Date: 06.08.18

Test Reference: P107 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.86	1.24	1.19	1.10
	1	0.95	1.36	1.28	1.20
	2	0.97	1.36	1.29	1.21
	3	0.97	1.36	1.29	1.21
	4	0.97	1.36	1.29	1.21
50kN/m^2 Load	4.25	2.28	3.23	2.93	2.81
	5	2.38	3.32	2.99	2.90
	6	2.40	3.37	3.00	2.92
	7	2.40	3.37	3.01	2.93
	8	2.40	3.37	3.01	2.93
75kN/m^2 Load	8.25	3.70	5.65	4.61	4.65
	9	3.79	5.82	4.67	4.76
	10	3.81	5.86	4.69	4.79
	11	3.82	5.90	4.69	4.80
	12	3.82	5.92	4.69	4.81
100kN/m^2 Load	12.25	4.43	6.99	5.51	5.64
	13	4.54	7.17	5.58	5.76
	14	4.56	7.20	5.59	5.78
	15	4.57	7.24	5.61	5.81
	16	4.57	7.26	5.62	5.82
125kN/m^2 Load	16.25	5.06	8.08	6.27	6.47
	17	5.17	8.25	6.35	6.59
	18	5.20	8.29	6.38	6.62
	19	5.22	8.31	6.39	6.64
	20	5.23	8.32	6.39	6.65
0kN/m^2 Unload	20.25	3.54	5.51	3.77	4.27
	21	3.23	5.09	3.47	3.93
	22	3.14	4.96	3.36	3.82
	23	3.09	4.87	3.30	3.75
	24	3.06	4.81	3.26	3.71

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P107



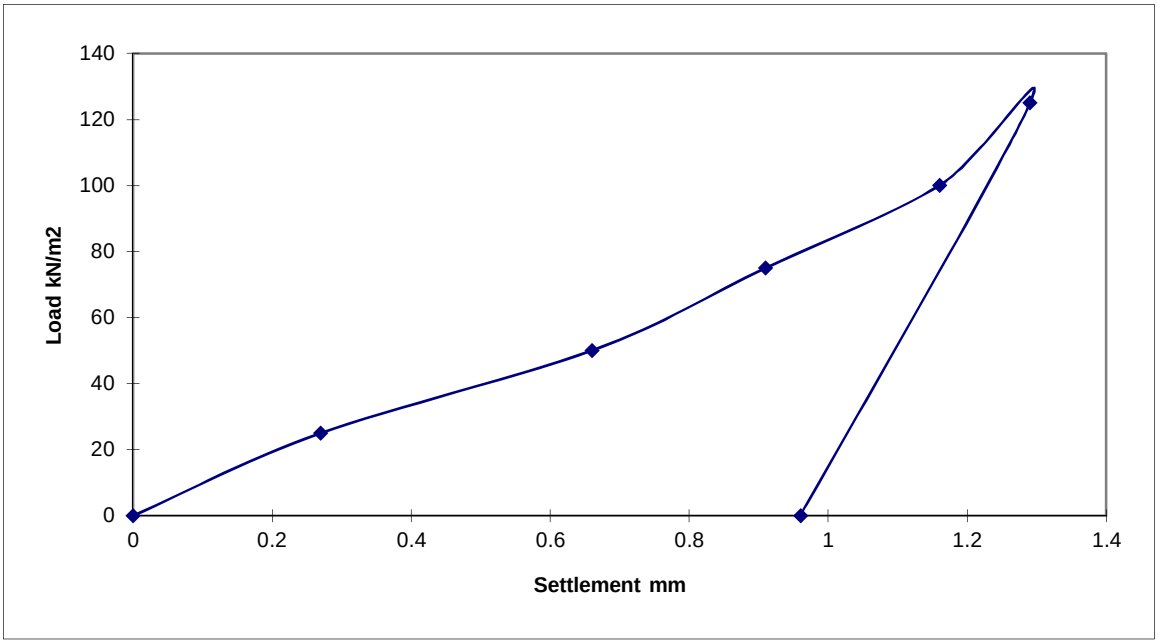
Contract: Merthyr Vale	Date: 06.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P108	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.27	25	4
0.66	50	8
0.91	75	12
1.16	100	16
1.29	125	20
0.96	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale	Date: 0o.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

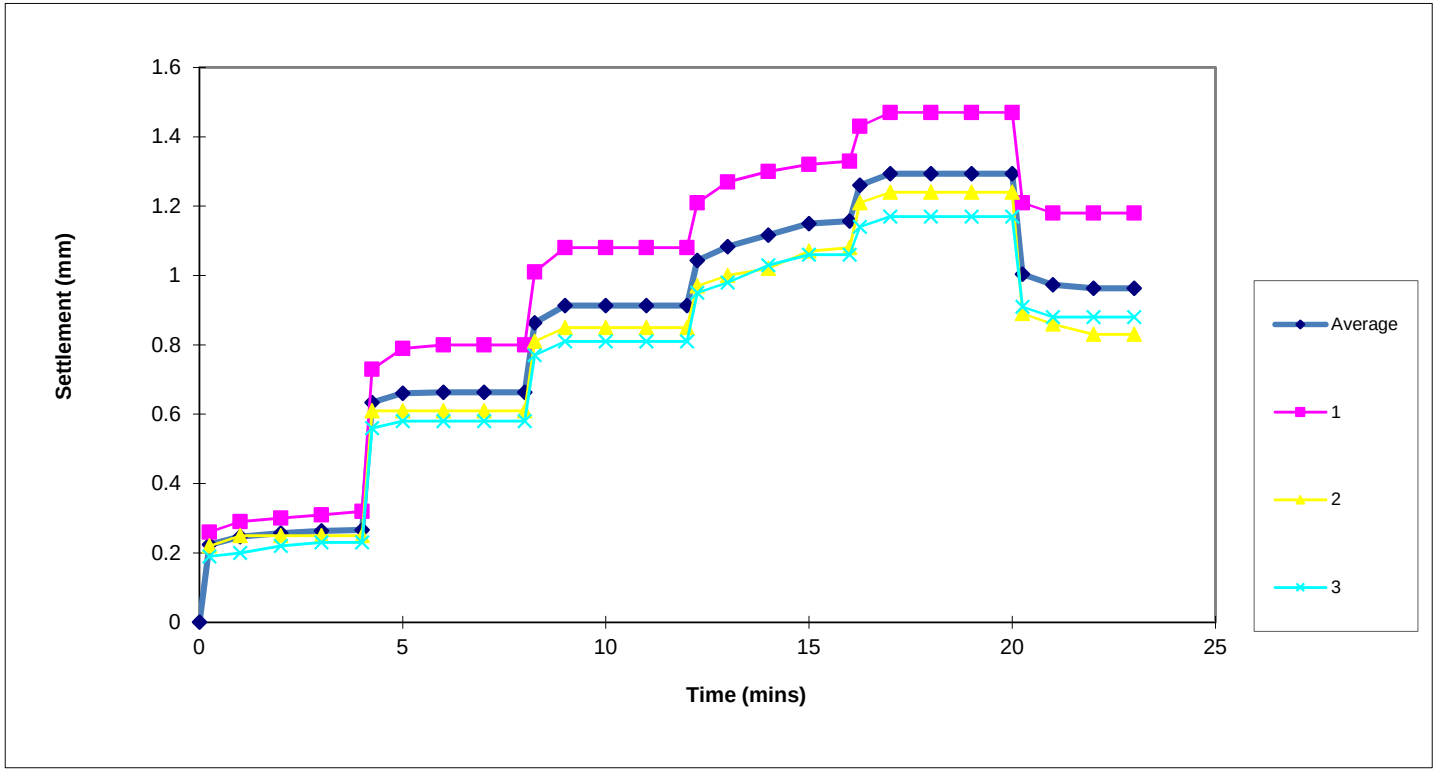
Contract: Merthyr Vale | Date: 06.08.18

Test Reference: P108 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.26	0.22	0.19	0.22
	1	0.29	0.25	0.20	0.25
	2	0.30	0.25	0.22	0.26
	3	0.31	0.25	0.23	0.26
	4	0.32	0.25	0.23	0.27
50kN/m^2 Load	4.25	0.73	0.61	0.56	0.63
	5	0.79	0.61	0.58	0.66
	6	0.80	0.61	0.58	0.66
	7	0.80	0.61	0.58	0.66
	8	0.80	0.61	0.58	0.66
75kN/m^2 Load	8.25	1.01	0.81	0.77	0.86
	9	1.08	0.85	0.81	0.91
	10	1.08	0.85	0.81	0.91
	11	1.08	0.85	0.81	0.91
	12	1.08	0.85	0.81	0.91
100kN/m^2 Load	12.25	1.21	0.97	0.95	1.04
	13	1.27	1.00	0.98	1.08
	14	1.30	1.02	1.03	1.12
	15	1.32	1.07	1.06	1.15
	16	1.33	1.08	1.06	1.16
125kN/m^2 Load	16.25	1.43	1.21	1.14	1.26
	17	1.47	1.24	1.17	1.29
	18	1.47	1.24	1.17	1.29
	19	1.47	1.24	1.17	1.29
	20	1.47	1.24	1.17	1.29
0kN/m^2 Unload	20.25	1.21	0.89	0.91	1.00
	21	1.18	0.86	0.88	0.97
	22	1.18	0.83	0.88	0.96
	23	1.18	0.83	0.88	0.96

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P108



Contract: Merthyr Vale	Date: 06.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 109	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Yellow Brown Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.55	25	4
1.30	50	8
1.98	75	12
3.25	100	16
4.88	125	20
3.26	0	24

Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

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SOUTHERN GROUND TESTING

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 11.10.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Merthyr Vale — Date: 11.10.18

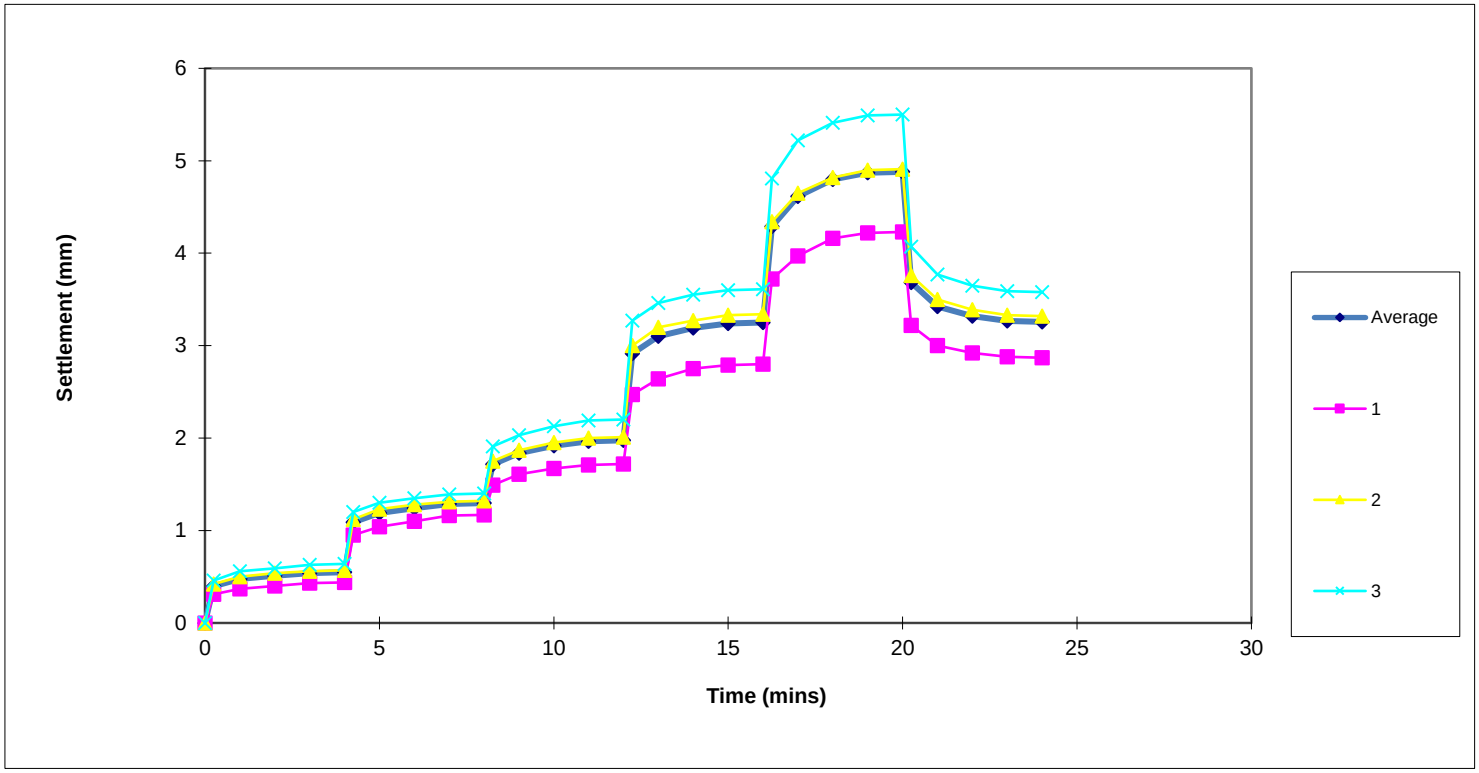
Test Reference: Plate 109	Test Depth: Surface	Plate Diameter: 600mm Seating Load: 7.5kN/m^2

Load	Time (mins)	Travel Gauges set on plate Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.31	0.42	0.46	0.40
	1	0.37	0.50	0.56	0.48
	2	0.40	0.54	0.59	0.51
	3	0.43	0.56	0.63	0.54
	4	0.44	0.57	0.64	0.55
50kN/m^2 Load	4.25	0.95	1.12	1.20	1.09
	5	1.04	1.23	1.30	1.19
	6	1.10	1.28	1.35	1.24
	7	1.16	1.31	1.39	1.29
	8	1.17	1.32	1.40	1.30
75kN/m^2 Load	8.25	1.49	1.75	1.91	1.72
	9	1.61	1.87	2.03	1.84
	10	1.67	1.95	2.13	1.92
	11	1.71	2.00	2.19	1.97
	12	1.72	2.01	2.20	1.98
100kN/m^2 Load	12.25	2.47	3.00	3.27	2.91
	13	2.64	3.20	3.46	3.10
	14	2.75	3.27	3.55	3.19
	15	2.79	3.33	3.60	3.24
	16	2.80	3.34	3.61	3.25
125kN/m^2 Load	16.25	3.72	4.34	4.81	4.29
	17	3.97	4.65	5.22	4.61
	18	4.16	4.82	5.41	4.80
	19	4.22	4.90	5.49	4.87
	20	4.23	4.91	5.50	4.88
0kN/m^2 Unload	20.25	3.22	3.76	4.07	3.68
	21	3.00	3.50	3.77	3.42
	22	2.92	3.39	3.65	3.32
	23	2.88	3.33	3.59	3.27
	24	2.87	3.32	3.58	3.26

SOUTHERN GROUND TESTING

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Plate 109



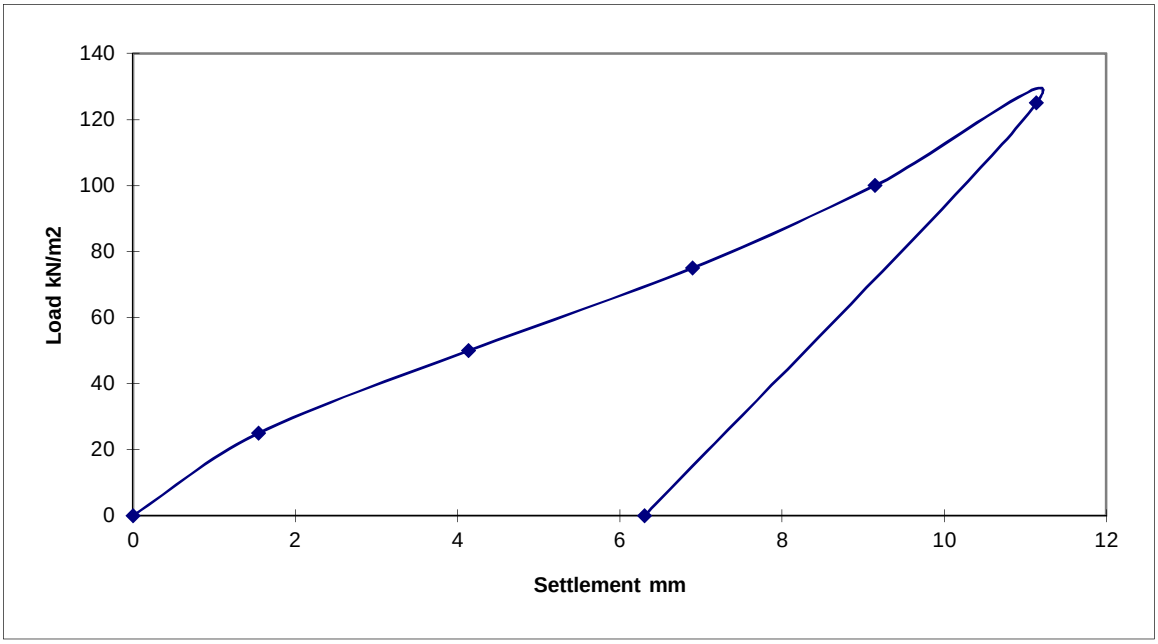
Contract: Merthyr Vale	Date: 11.10.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P110	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.55	25	4
4.14	50	8
6.90	75	12
9.15	100	16
11.14	125	20
6.31	0	24



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale	Date: 0o.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

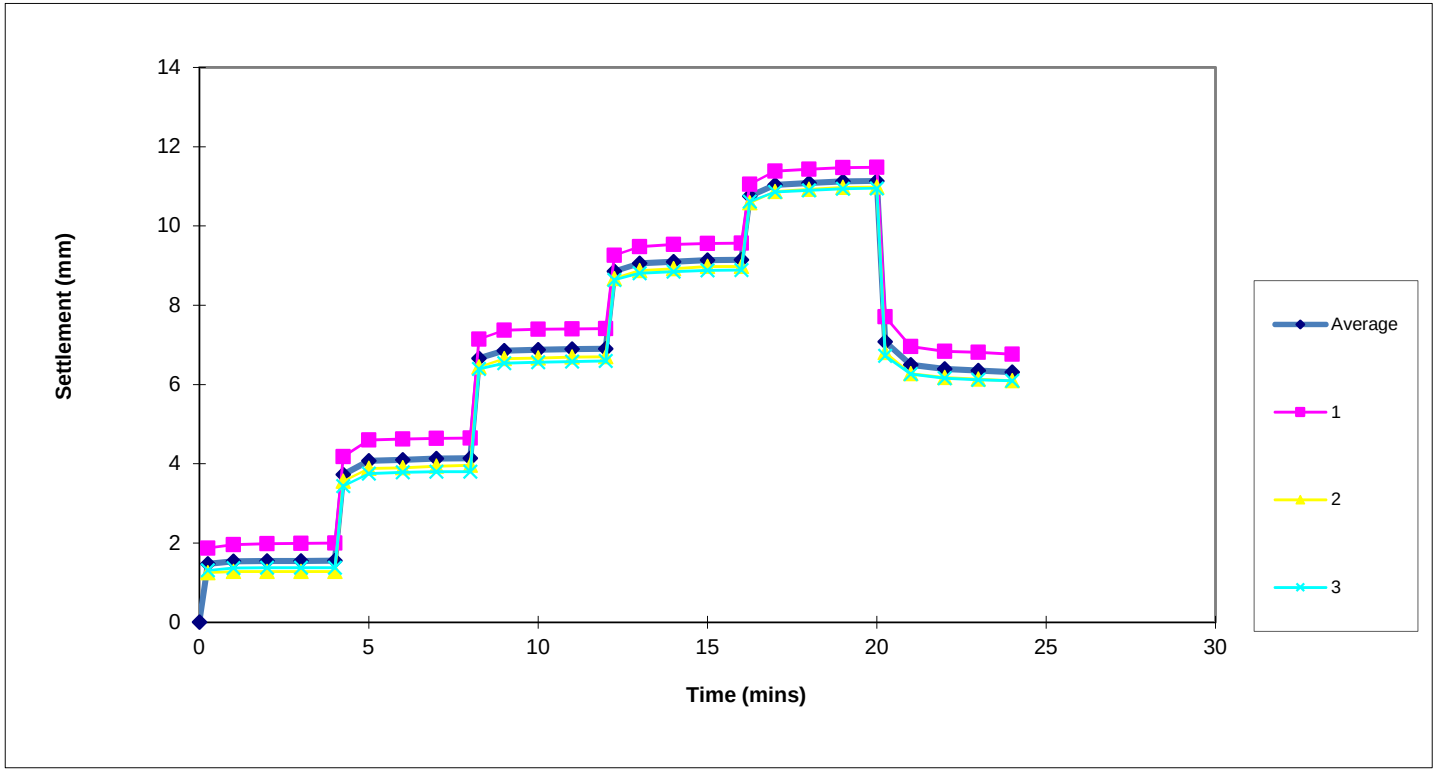
Contract: Merthyr Vale | Date: 06.08.18

Test Reference: P110 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	1.87	1.25	1.31	1.48
	1	1.96	1.28	1.37	1.54
	2	1.98	1.28	1.38	1.55
	3	1.99	1.28	1.38	1.55
	4	2.00	1.28	1.38	1.55
50kN/m^2 Load	4.25	4.18	3.56	3.44	3.73
	5	4.60	3.88	3.75	4.08
	6	4.62	3.90	3.78	4.10
	7	4.64	3.94	3.80	4.13
	8	4.65	3.96	3.80	4.14
75kN/m^2 Load	8.25	7.14	6.44	6.39	6.66
	9	7.37	6.65	6.54	6.85
	10	7.39	6.67	6.56	6.87
	11	7.40	6.69	6.58	6.89
	12	7.41	6.70	6.59	6.90
100kN/m^2 Load	12.25	9.26	8.67	8.64	8.86
	13	9.48	8.87	8.81	9.05
	14	9.53	8.92	8.85	9.10
	15	9.56	8.98	8.88	9.14
	16	9.57	8.98	8.89	9.15
125kN/m^2 Load	16.25	11.05	10.58	10.62	10.75
	17	11.38	10.87	10.86	11.04
	18	11.43	10.92	10.90	11.08
	19	11.47	10.97	10.94	11.13
	20	11.48	10.98	10.95	11.14
0kN/m^2 Unload	20.25	7.71	6.80	6.72	7.08
	21	6.96	6.27	6.26	6.50
	22	6.84	6.17	6.16	6.39
	23	6.81	6.13	6.12	6.35
	24	6.76	6.09	6.09	6.31

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P110



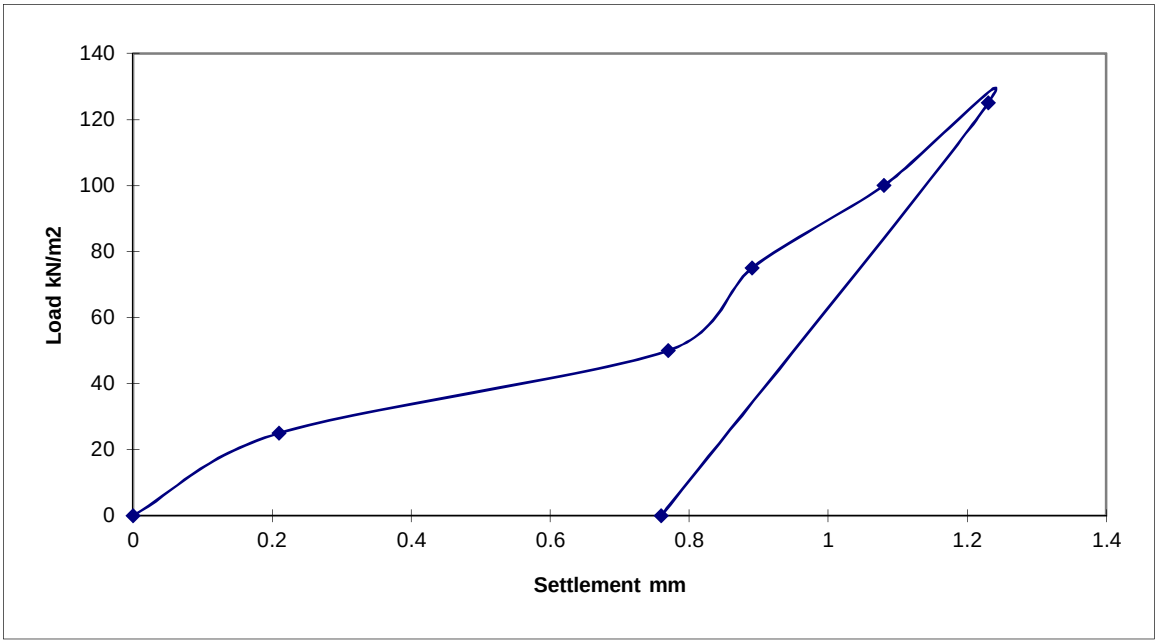
Contract: Merthyr Vale	Date: 06.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P111	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.21	25	4
0.77	50	8
0.89	75	12
1.08	100	16
1.23	125	20
0.76	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale	Date: 0o.08.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

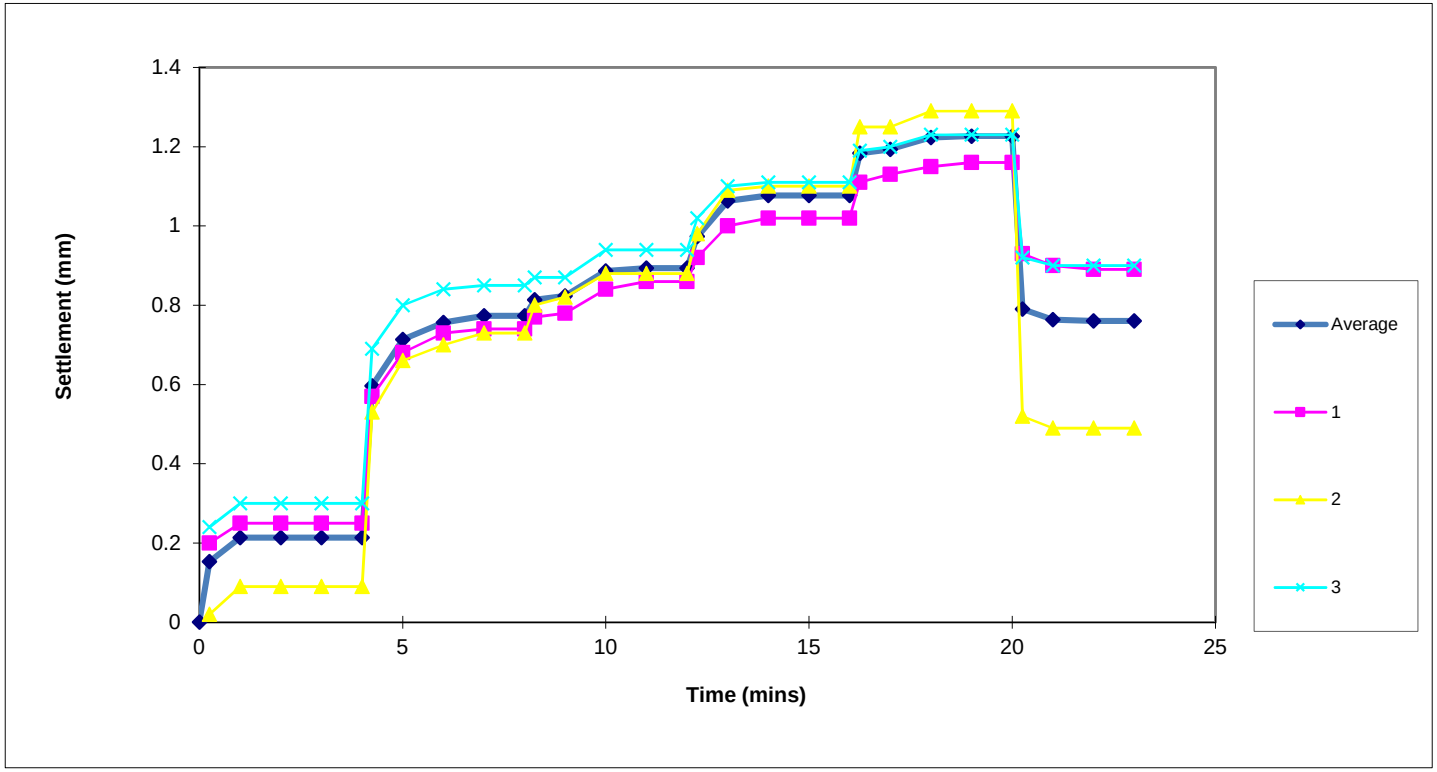
Contract: Merthyr Vale | Date: 06.08.18

Test Reference: P111 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.20	0.02	0.24	0.15
	1	0.25	0.09	0.30	0.21
	2	0.25	0.09	0.30	0.21
	3	0.25	0.09	0.30	0.21
	4	0.25	0.09	0.30	0.21
50kN/m^2 Load	4.25	0.57	0.53	0.69	0.60
	5	0.68	0.66	0.80	0.71
	6	0.73	0.70	0.84	0.76
	7	0.74	0.73	0.85	0.77
	8	0.74	0.73	0.85	0.77
75kN/m^2 Load	8.25	0.77	0.80	0.87	0.81
	9	0.78	0.82	0.87	0.82
	10	0.84	0.88	0.94	0.89
	11	0.86	0.88	0.94	0.89
	12	0.86	0.88	0.94	0.89
100kN/m^2 Load	12.25	0.92	0.98	1.02	0.97
	13	1.00	1.09	1.10	1.06
	14	1.02	1.10	1.11	1.08
	15	1.02	1.10	1.11	1.08
	16	1.02	1.10	1.11	1.08
125kN/m^2 Load	16.25	1.11	1.25	1.19	1.18
	17	1.13	1.25	1.20	1.19
	18	1.15	1.29	1.23	1.22
	19	1.16	1.29	1.23	1.23
	20	1.16	1.29	1.23	1.23
0kN/m^2 Unload	20.25	0.93	0.52	0.92	0.79
	21	0.90	0.49	0.90	0.76
	22	0.89	0.49	0.90	0.76
	23	0.89	0.49	0.90	0.76

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P111



Contract: Merthyr Vale	Date: 06.08.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P112	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.11	25	4
3.55	50	8
6.15	75	12
8.25	100	17
10.66	125	26
6.13	0	30

Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale	Date: 28.09.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

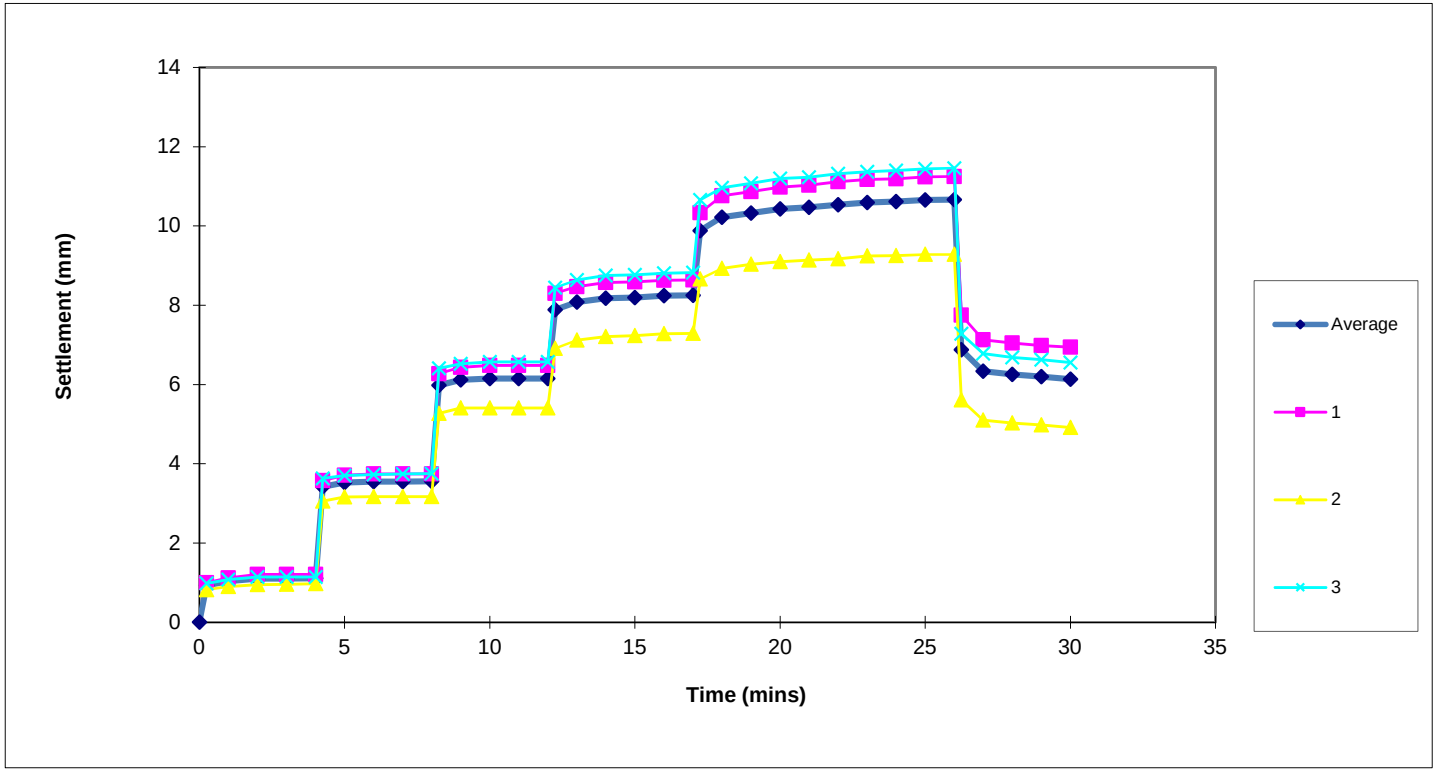
Contract: Merthyr Vale | Date: 28.09.18

Test Reference: P112 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	1.00	0.82	0.98	0.93
	1	1.12	0.90	1.08	1.03
	2	1.21	0.95	1.14	1.10
	3	1.21	0.96	1.14	1.10
	4	1.21	0.97	1.14	1.11
50kN/m^2 Load	4.25	3.57	3.06	3.63	3.42
	5	3.71	3.16	3.70	3.52
	6	3.74	3.17	3.73	3.55
	7	3.74	3.17	3.74	3.55
	8	3.74	3.17	3.75	3.55
75kN/m^2 Load	8.25	6.27	5.27	6.41	5.98
	9	6.43	5.41	6.52	6.12
	10	6.48	5.41	6.57	6.15
	11	6.48	5.41	6.57	6.15
	12	6.48	5.41	6.57	6.15
100kN/m^2 Load	12.25	8.30	6.91	8.44	7.88
	13	8.47	7.12	8.64	8.08
	14	8.57	7.21	8.75	8.18
	15	8.59	7.23	8.77	8.20
	16	8.63	7.28	8.81	8.24
	17	8.64	7.29	8.82	8.25
125kN/m^2 Load	17.25	10.33	8.66	10.66	9.88
	18	10.76	8.93	10.96	10.22
	19	10.87	9.03	11.08	10.33
	20	10.98	9.10	11.20	10.43
	21	11.03	9.14	11.23	10.47
	22	11.12	9.17	11.32	10.54
	23	11.17	9.24	11.37	10.59
	24	11.19	9.25	11.40	10.61
	25	11.24	9.28	11.44	10.65
	26	11.25	9.28	11.46	10.66
0kN/m^2 Unload	26.25	7.75	5.61	7.28	6.88
	27	7.13	5.10	6.78	6.34
	28	7.05	5.03	6.68	6.25
	29	6.98	4.98	6.63	6.20
	30	6.94	4.91	6.55	6.13

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P112



Contract: Merthyr Vale	Date: 28.09.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P113	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.88	25	4
2.52	50	8
4.14	75	12
5.89	100	16
6.94	125	20
4.84	0	24

Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale

Date: 28.09.18
Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

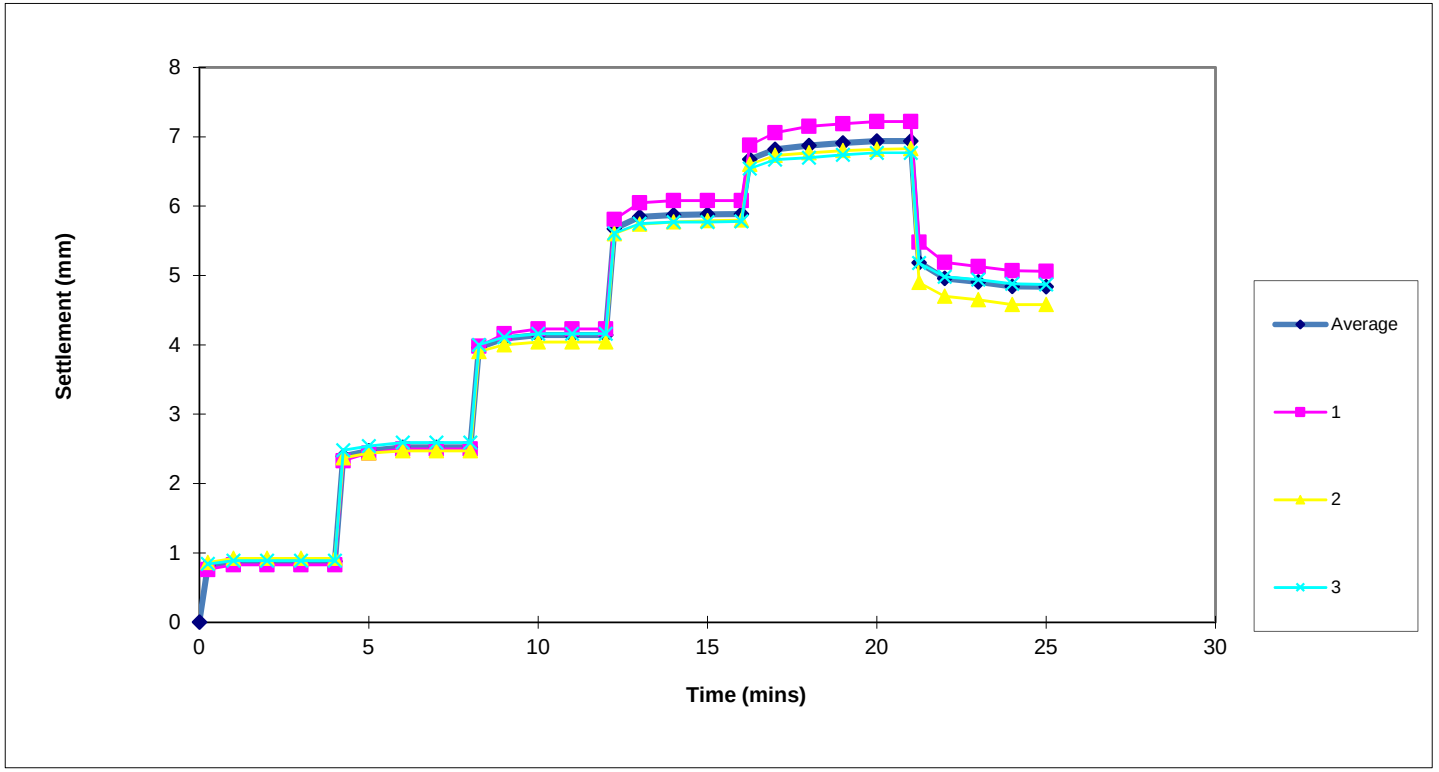
Contract: Merthyr Vale | Date: 28.09.18

Test Reference: P113 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.76	0.86	0.84	0.82
	1	0.83	0.92	0.89	0.88
	2	0.83	0.92	0.89	0.88
	3	0.83	0.92	0.89	0.88
	4	0.83	0.92	0.89	0.88
50kN/m^2 Load	4.25	2.33	2.37	2.48	2.39
	5	2.44	2.44	2.54	2.47
	6	2.50	2.47	2.59	2.52
	7	2.50	2.47	2.59	2.52
	8	2.50	2.47	2.59	2.52
75kN/m^2 Load	8.25	3.98	3.90	4.00	3.96
	9	4.16	4.00	4.11	4.09
	10	4.23	4.04	4.16	4.14
	11	4.23	4.04	4.16	4.14
	12	4.23	4.04	4.16	4.14
100kN/m^2 Load	12.25	5.81	5.60	5.61	5.67
	13	6.05	5.74	5.75	5.85
	14	6.08	5.77	5.77	5.87
	15	6.08	5.79	5.77	5.88
	16	6.08	5.80	5.78	5.89
125kN/m^2 Load	16.25	6.88	6.60	6.54	6.67
	17	7.06	6.73	6.67	6.82
	18	7.15	6.77	6.70	6.87
	19	7.19	6.80	6.74	6.91
	20	7.22	6.82	6.77	6.94
	21	7.22	6.83	6.77	6.94
0kN/m^2 Unload	21.25	5.48	4.90	5.18	5.19
	22	5.19	4.70	4.98	4.96
	23	5.13	4.65	4.94	4.91
	24	5.07	4.58	4.88	4.84
	25	5.06	4.58	4.87	4.84

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P113



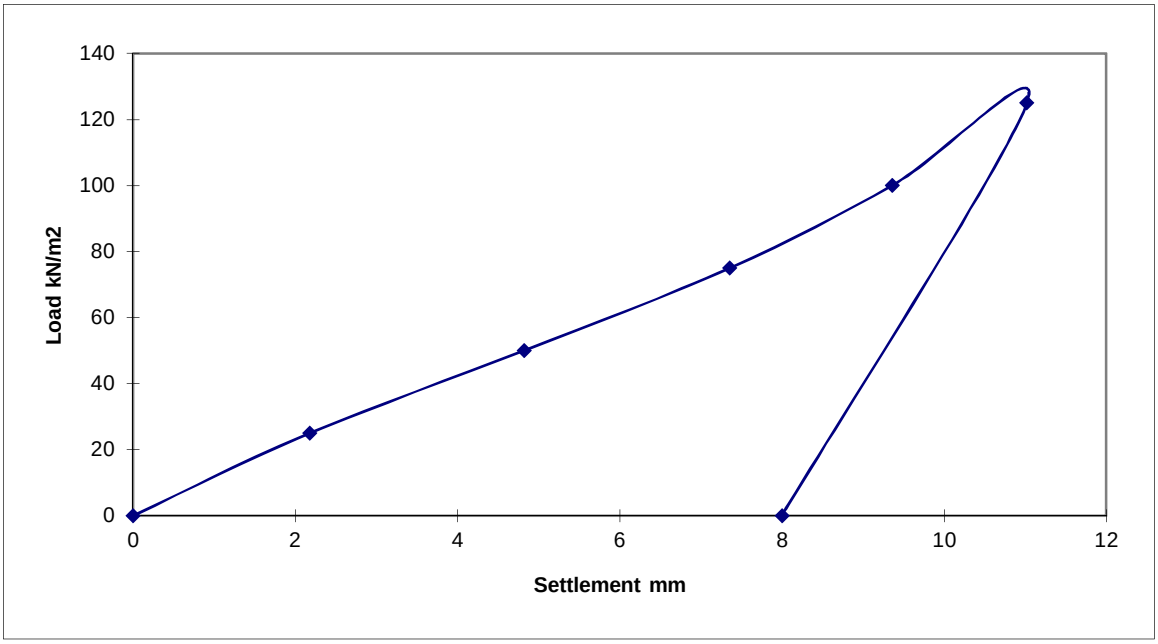
Contract: Merthyr Vale	Date: 28.09.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P114	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
2.18	25	6
4.82	50	11
7.36	75	16
9.36	100	22
11.02	125	29
8.00	0	32



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale

Date: 28.09.18
Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

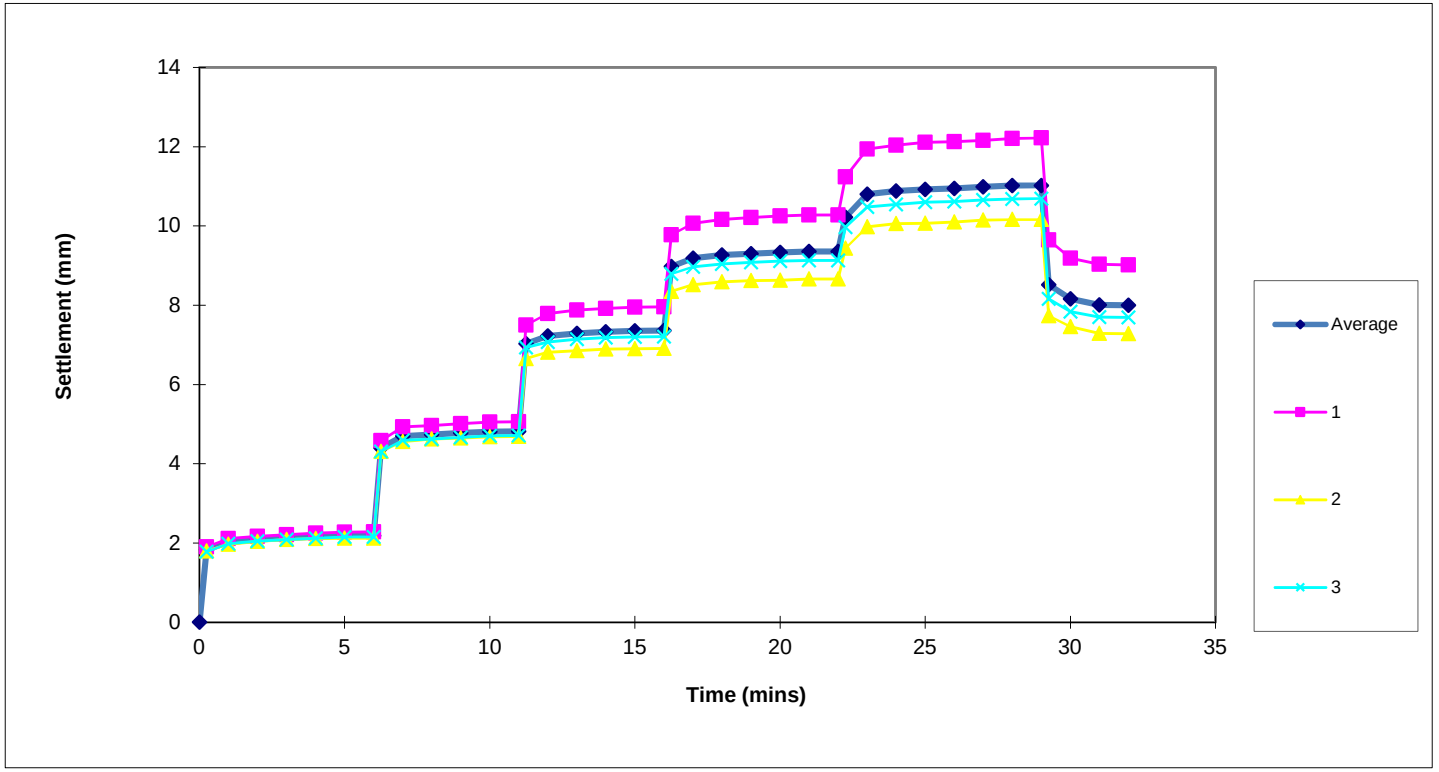
Contract: Merthyr Vale | Date: 28.09.18

Test Reference: P114 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	1.90	1.80	1.78	1.83
	1	2.11	1.97	1.98	2.02
	2	2.17	2.04	2.05	2.09
	3	2.21	2.09	2.09	2.13
	4	2.25	2.11	2.12	2.16
	5	2.27	2.12	2.15	2.18
	6	2.28	2.12	2.15	2.18
50kN/m^2 Load	6.25	4.58	4.31	4.31	4.40
	7	4.93	4.56	4.59	4.69
	8	4.96	4.62	4.62	4.73
	9	5.01	4.65	4.66	4.77
	10	5.05	4.68	4.70	4.81
	11	5.06	4.69	4.71	4.82
75kN/m^2 Load	11.25	7.50	6.65	6.93	7.03
	12	7.79	6.81	7.07	7.22
	13	7.88	6.85	7.14	7.29
	14	7.92	6.89	7.18	7.33
	15	7.95	6.90	7.20	7.35
	16	7.96	6.91	7.21	7.36
100kN/m^2 Load	16.25	9.78	8.35	8.79	8.97
	17	10.07	8.52	8.97	9.19
	18	10.16	8.59	9.04	9.26
	19	10.21	8.62	9.08	9.30
	20	10.25	8.63	9.11	9.33
	21	10.28	8.66	9.13	9.36
	22	10.28	8.66	9.13	9.36
125kN/m^2 Load	22.25	11.24	9.44	9.97	10.22
	23	11.94	9.98	10.48	10.80
	24	12.04	10.06	10.54	10.88
	25	12.11	10.07	10.60	10.93
	26	12.13	10.10	10.62	10.95
	27	12.16	10.15	10.66	10.99
	28	12.21	10.16	10.68	11.02
	29	12.22	10.16	10.69	11.02
0kN/m^2 Unload	29.25	9.65	7.73	8.16	8.51
	30	9.19	7.46	7.84	8.16
	31	9.03	7.29	7.70	8.01
	32	9.02	7.28	7.69	8.00

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P114



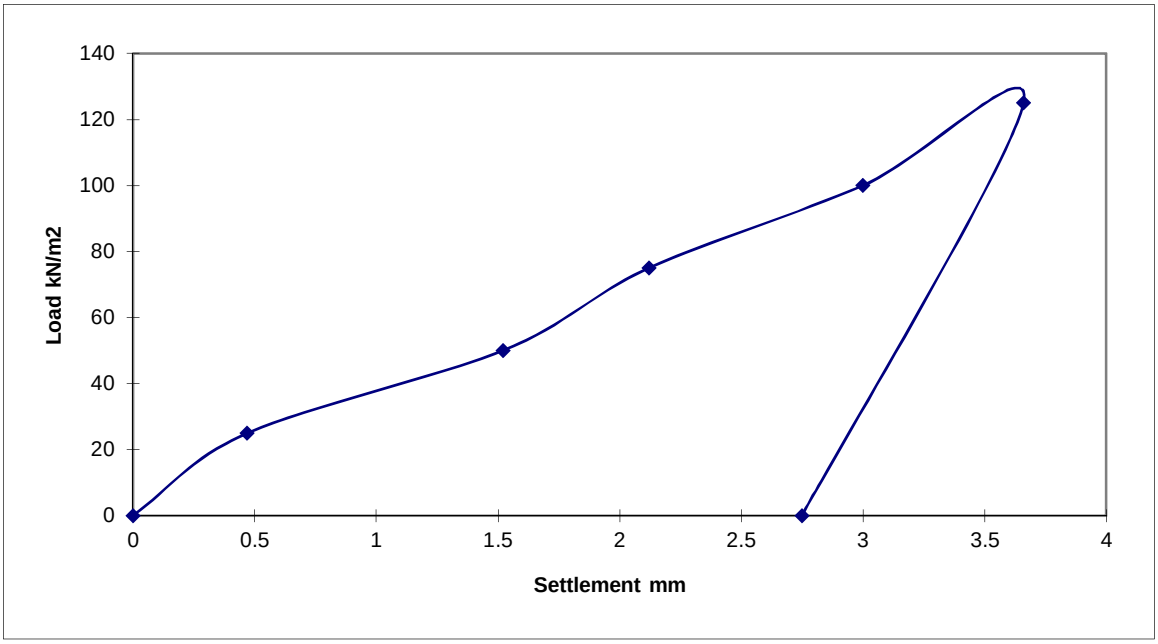
Contract: Merthyr Vale	Date: 28.09.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P115	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.47	25	4
1.52	50	8
2.12	75	12
3.00	100	16
3.66	125	20
2.75	0	23



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale	Date: 28.09.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

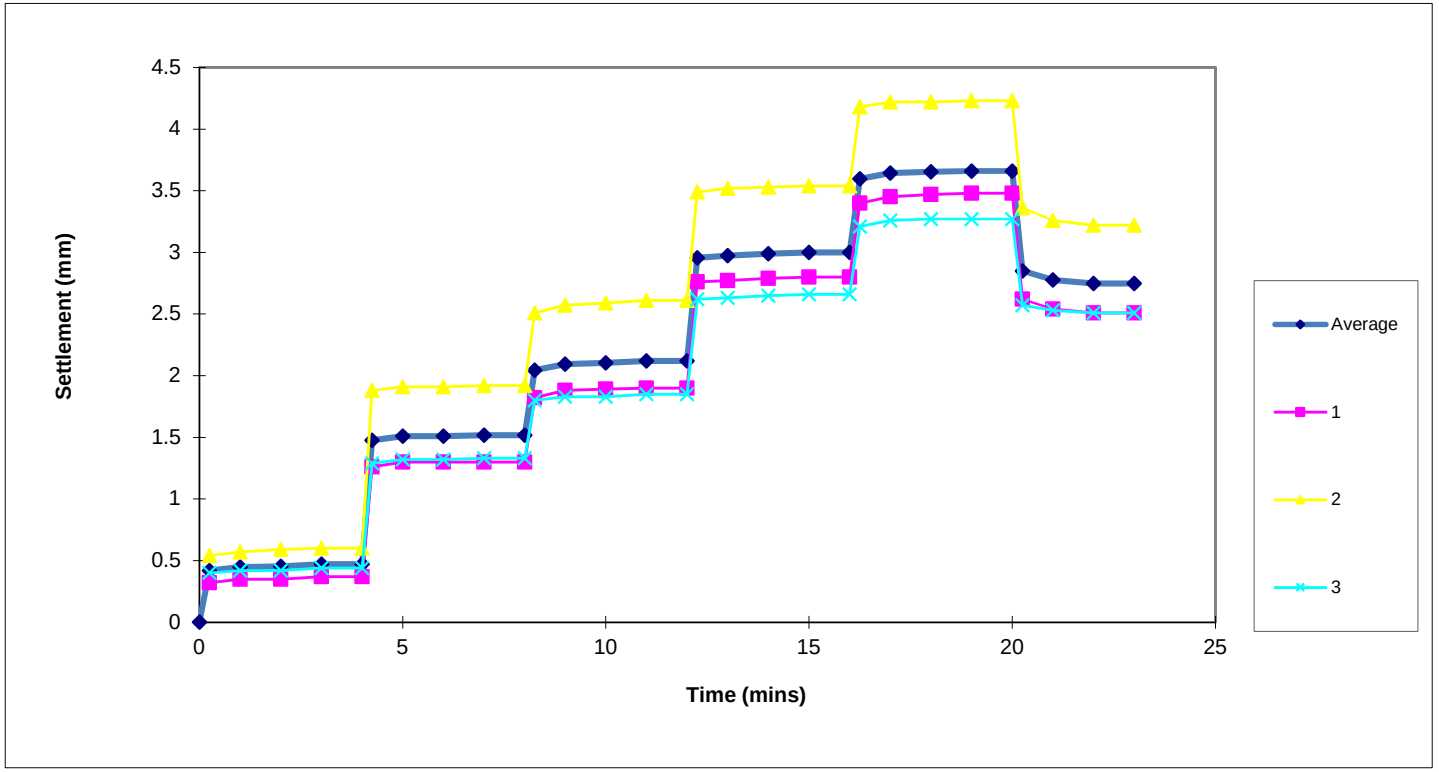
Contract: Merthyr Vale | Date: 28.09.18

Test Reference: P115 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.32	0.54	0.40	0.42
	1	0.35	0.57	0.42	0.45
	2	0.35	0.59	0.42	0.45
	3	0.37	0.60	0.44	0.47
	4	0.37	0.60	0.44	0.47
50kN/m^2 Load	4.25	1.26	1.88	1.29	1.48
	5	1.30	1.91	1.32	1.51
	6	1.30	1.91	1.32	1.51
	7	1.30	1.92	1.33	1.52
	8	1.30	1.92	1.33	1.52
75kN/m^2 Load	8.25	1.82	2.51	1.80	2.04
	9	1.88	2.57	1.83	2.09
	10	1.89	2.59	1.83	2.10
	11	1.90	2.61	1.85	2.12
	12	1.90	2.61	1.85	2.12
100kN/m^2 Load	12.25	2.76	3.49	2.62	2.96
	13	2.77	3.52	2.63	2.97
	14	2.79	3.53	2.65	2.99
	15	2.80	3.54	2.66	3.00
	16	2.80	3.54	2.66	3.00
125kN/m^2 Load	16.25	3.40	4.18	3.21	3.60
	17	3.45	4.22	3.26	3.64
	18	3.47	4.22	3.27	3.65
	19	3.48	4.23	3.27	3.66
	20	3.48	4.23	3.27	3.66
0kN/m^2 Unload	20.25	2.62	3.36	2.57	2.85
	21	2.54	3.26	2.53	2.78
	22	2.51	3.22	2.51	2.75
	23	2.51	3.22	2.51	2.75

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P115



Contract: Merthyr Vale	Date: 28.09.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference:	Test Depth:	Plate Diameter:	Soil Description:
P116	Surface	600mm	Brown clay with gravel.

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.87	25	4
2.57	50	8
3.80	75	12
5.69	100	16
6.89	125	20
4.49	0	24

Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale	Date: 28.09.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

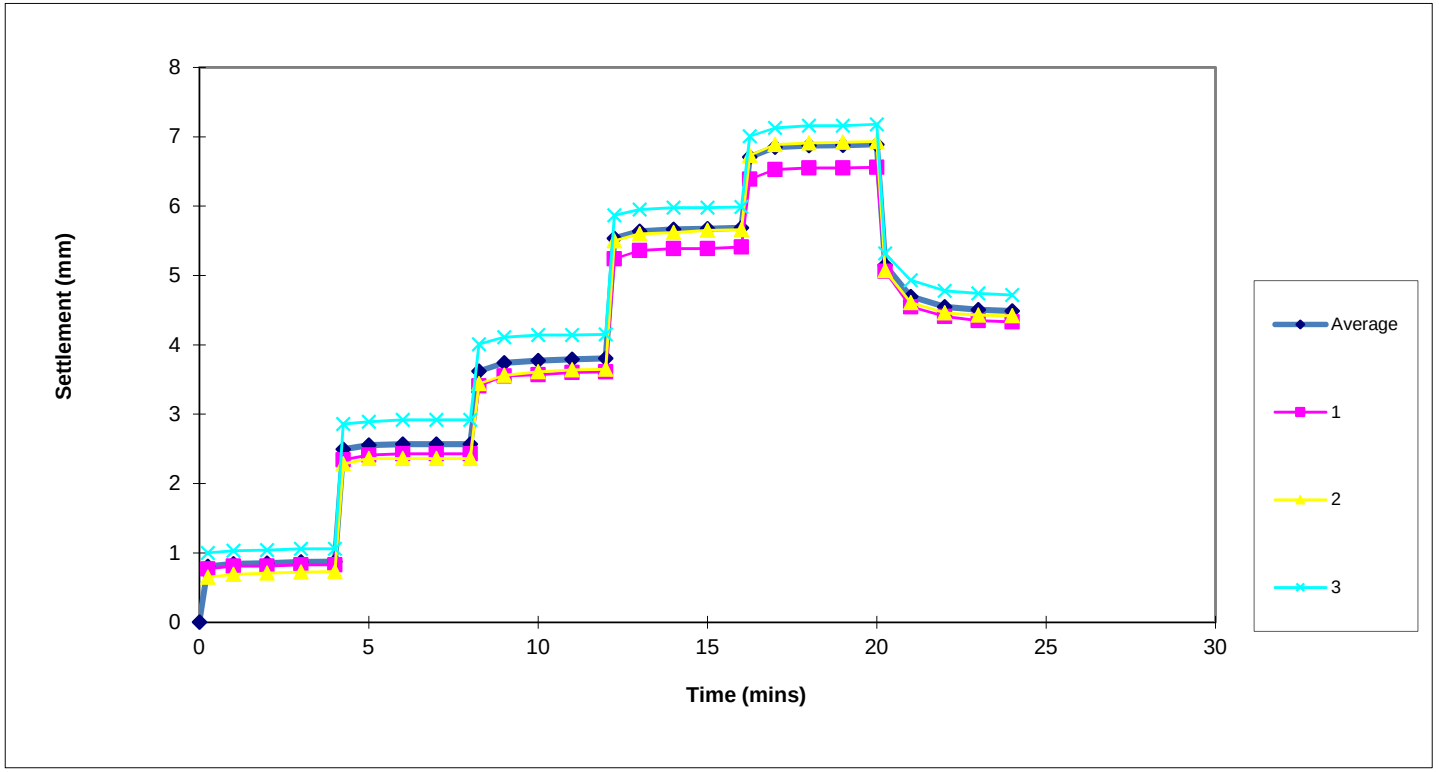
Contract: Merthyr Vale | Date: 28.09.18

Test Reference: P116 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0				0
	0.25	0.77	0.65	1.00	0.81
	1	0.81	0.69	1.03	0.84
	2	0.81	0.71	1.04	0.85
	3	0.83	0.72	1.06	0.87
	4	0.83	0.73	1.06	0.87
50kN/m^2 Load	4.25	2.34	2.28	2.86	2.49
	5	2.41	2.36	2.89	2.55
	6	2.43	2.36	2.92	2.57
	7	2.43	2.36	2.92	2.57
	8	2.43	2.36	2.92	2.57
75kN/m^2 Load	8.25	3.41	3.44	4.01	3.62
	9	3.55	3.56	4.11	3.74
	10	3.57	3.61	4.14	3.77
	11	3.60	3.64	4.14	3.79
	12	3.61	3.65	4.15	3.80
100kN/m^2 Load	12.25	5.24	5.50	5.87	5.54
	13	5.36	5.60	5.95	5.64
	14	5.39	5.62	5.98	5.66
	15	5.39	5.65	5.98	5.67
	16	5.41	5.66	5.99	5.69
125kN/m^2 Load	16.25	6.39	6.73	7.01	6.71
	17	6.53	6.89	7.13	6.85
	18	6.55	6.91	7.16	6.87
	19	6.55	6.92	7.16	6.88
	20	6.56	6.93	7.18	6.89
0kN/m^2 Unload	20.25	5.06	5.07	5.32	5.15
	21	4.55	4.61	4.93	4.70
	22	4.41	4.46	4.78	4.55
	23	4.35	4.43	4.74	4.51
	24	4.33	4.42	4.72	4.49

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: P116



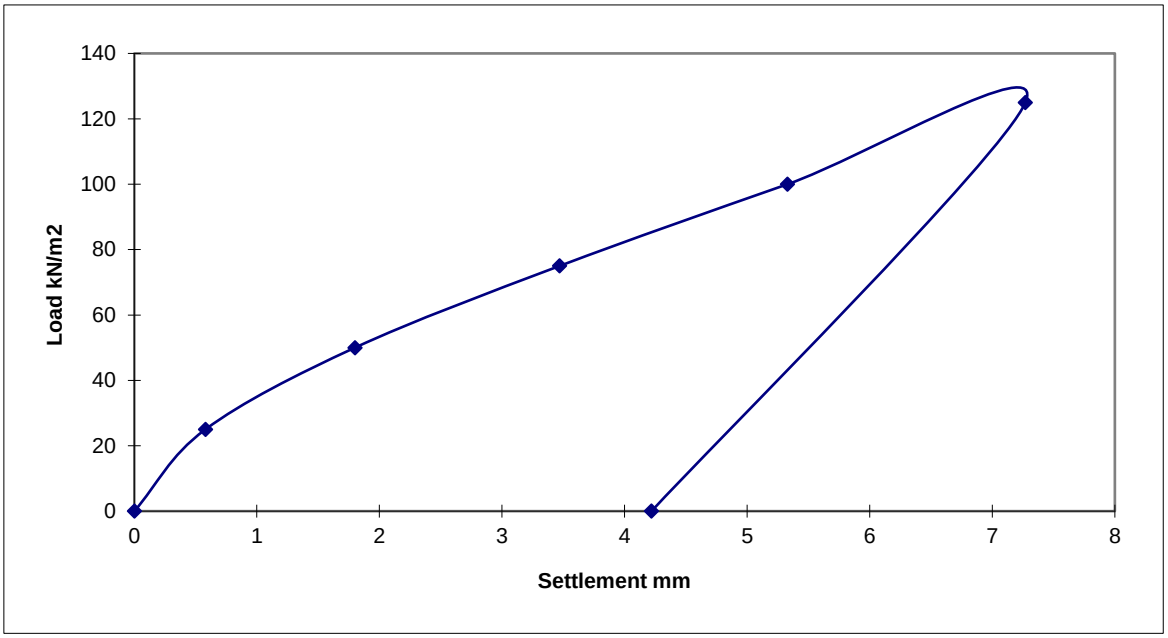
Contract: Merthyr Vale	Date: 28.09.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 117	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Yellow Brown Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
0.58	25	4
1.80	50	8
3.47	75	12
5.33	100	16
7.27	125	21
4.22	0	25



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

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SOUTHERN GROUND TESTING

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 11.10.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Merthyr Vale | Date: 11.10.18

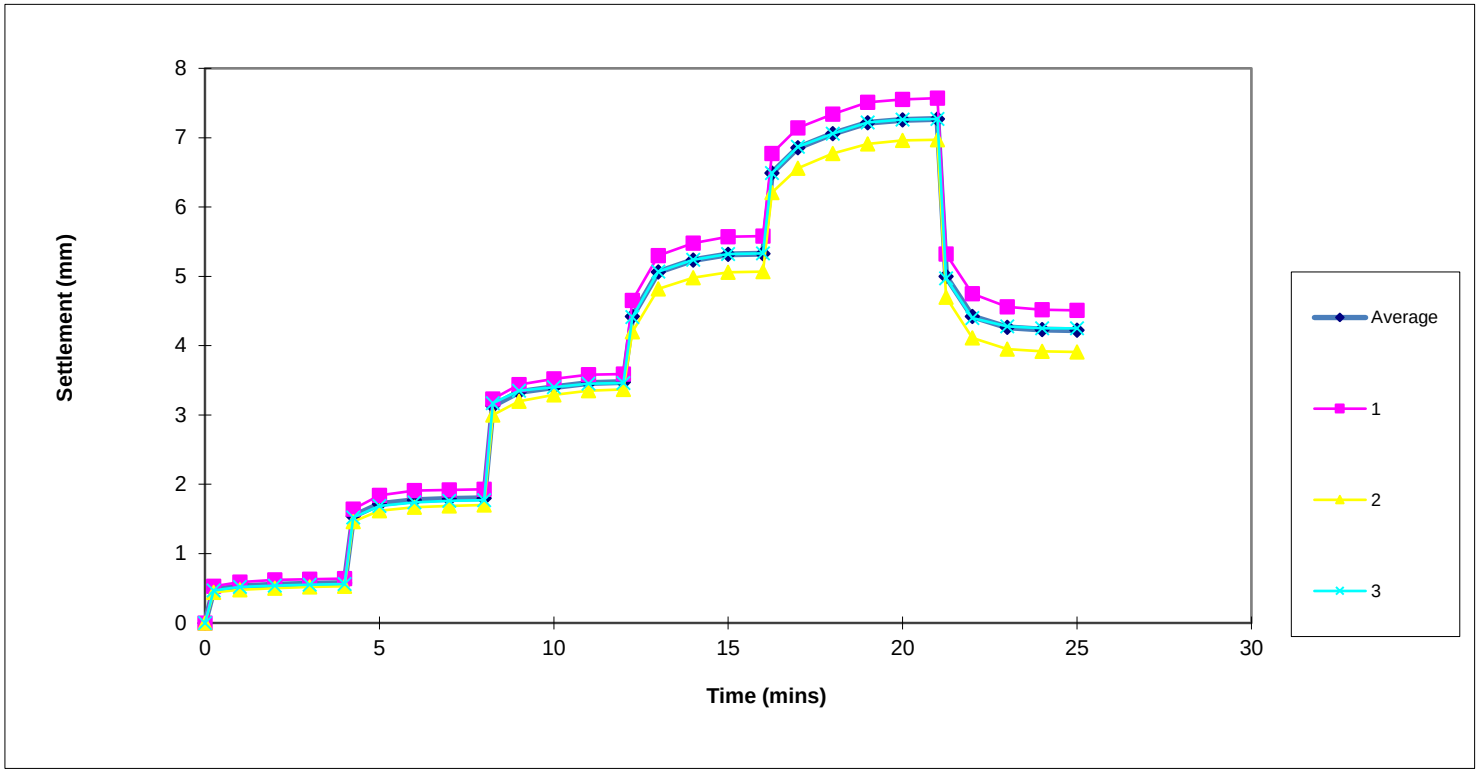
Test Reference: Plate 117 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.53	0.44	0.47	0.48
	1	0.59	0.48	0.52	0.53
	2	0.62	0.50	0.54	0.55
	3	0.63	0.52	0.55	0.57
	4	0.64	0.53	0.56	0.58
50kN/m^2 Load	4.25	1.64	1.46	1.52	1.54
	5	1.84	1.62	1.69	1.72
	6	1.91	1.67	1.74	1.77
	7	1.92	1.69	1.76	1.79
	8	1.93	1.70	1.77	1.80
75kN/m^2 Load	8.25	3.23	3.00	3.17	3.13
	9	3.44	3.20	3.35	3.33
	10	3.52	3.29	3.40	3.40
	11	3.58	3.35	3.45	3.46
	12	3.59	3.37	3.46	3.47
100kN/m^2 Load	12.25	4.65	4.20	4.41	4.42
	13	5.30	4.82	5.07	5.06
	14	5.48	4.98	5.24	5.23
	15	5.57	5.06	5.32	5.32
	16	5.58	5.07	5.33	5.33
125kN/m^2 Load	16.25	6.77	6.21	6.49	6.49
	17	7.14	6.56	6.87	6.86
	18	7.34	6.77	7.06	7.06
	19	7.51	6.91	7.22	7.21
	20	7.55	6.96	7.26	7.26
	21	7.57	6.97	7.27	7.27
0kN/m^2 Unload	21.25	5.32	4.70	4.97	5.00
	22	4.75	4.11	4.40	4.42
	23	4.56	3.95	4.28	4.26
	24	4.52	3.92	4.25	4.23
	25	4.51	3.91	4.25	4.22

SOUTHERN GROUND TESTING

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Plate 117



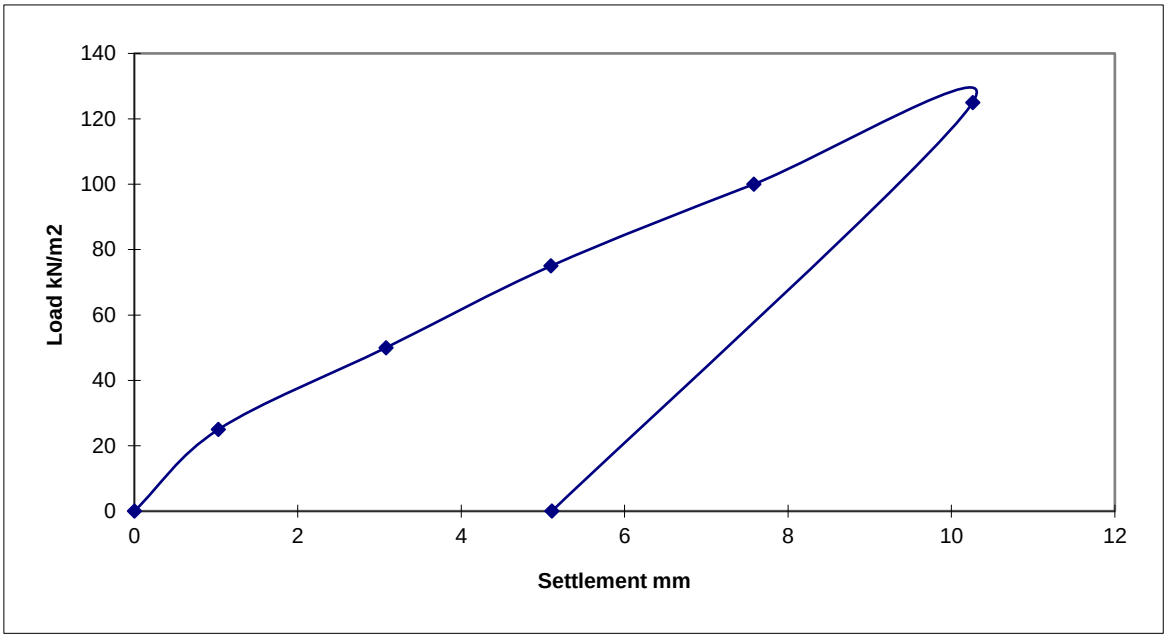
Contract: Merthyr Vale	Date: 11.10.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 118	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Yellow Brown Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.03	25	4
3.08	50	8
5.10	75	13
7.58	100	19
10.26	125	28
5.11	0	33



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

SOUTHERN GROUND TESTING

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 11.10.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Merthyr Vale | Date: 11.10.18

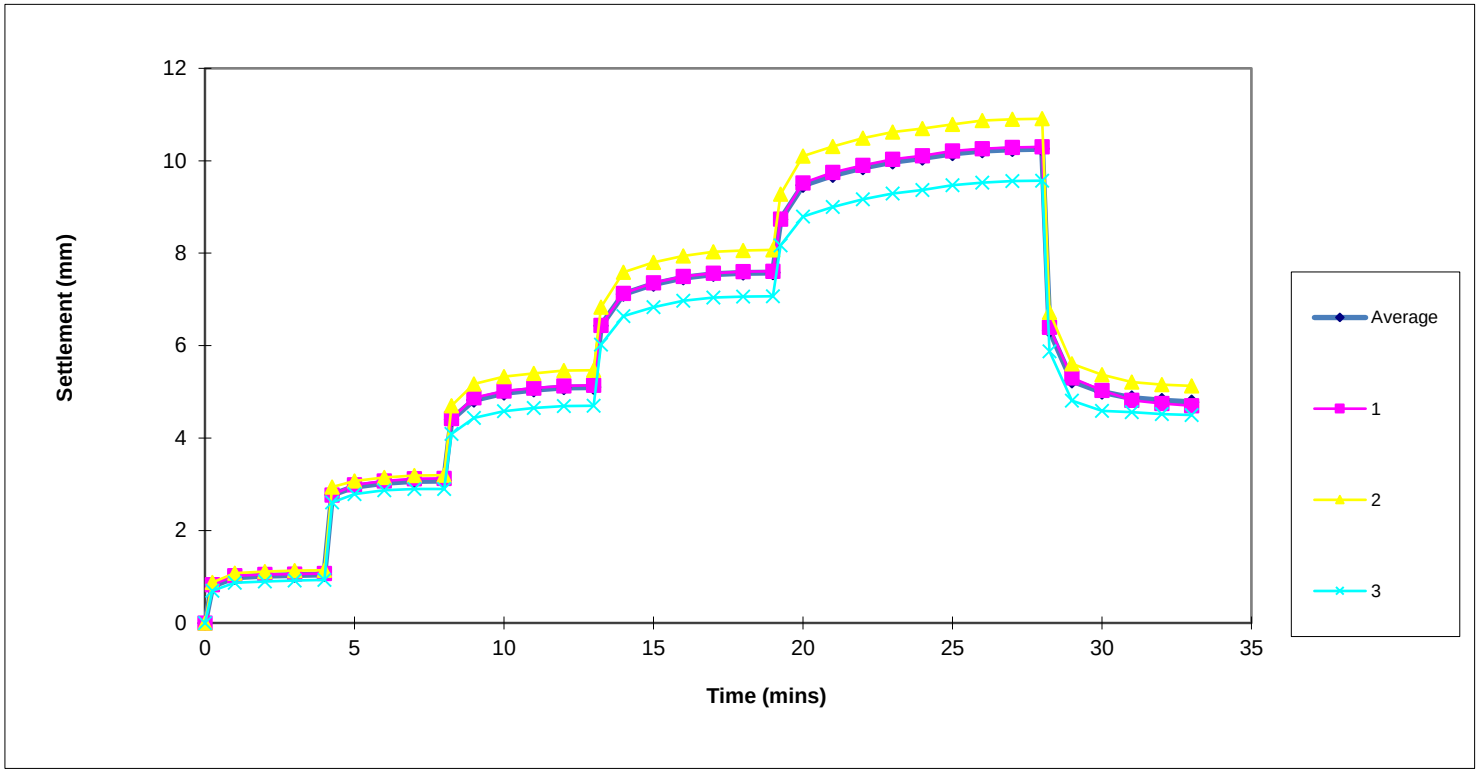
Test Reference: Plate 118 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.83	0.88	0.70	0.80
	1	1.02	1.08	0.87	0.99
	2	1.05	1.11	0.90	1.02
	3	1.06	1.13	0.92	1.04
	4	1.07	1.14	0.93	1.05
50kN/m^2 Load	4.25	2.77	2.94	2.61	2.77
	5	2.99	3.07	2.79	2.95
	6	3.07	3.15	2.87	3.03
	7	3.12	3.19	2.90	3.07
	8	3.13	3.20	2.90	3.08
75kN/m^2 Load	8.25	4.42	4.70	4.09	4.40
	9	4.87	5.17	4.44	4.83
	10	5.02	5.33	4.58	4.98
	11	5.08	5.40	4.65	5.04
	12	5.13	5.46	4.69	5.09
	13	5.14	5.47	4.70	5.10
100kN/m^2 Load	13.25	6.44	6.83	6.02	6.43
	14	7.13	7.59	6.64	7.12
	15	7.36	7.80	6.83	7.33
	16	7.50	7.94	6.97	7.47
	17	7.57	8.03	7.04	7.55
	18	7.60	8.06	7.06	7.57
	19	7.61	8.07	7.07	7.58
125kN/m^2 Load	19.25	8.74	9.28	8.17	8.73
	20	9.52	10.10	8.79	9.47
	21	9.75	10.31	9.00	9.69
	22	9.90	10.49	9.17	9.85
	23	10.03	10.62	9.29	9.98
	24	10.11	10.70	9.37	10.06
	25	10.21	10.79	9.47	10.16
	26	10.26	10.87	9.53	10.22
	27	10.29	10.90	9.56	10.25
	28	10.30	10.91	9.57	10.26
0kN/m^2 Unload	28.25	6.40	6.72	5.88	6.33
	29	5.30	5.61	4.81	5.24
	30	5.03	5.37	4.59	5.00
	31	4.82	5.21	4.56	4.86
	32	4.75	5.16	4.52	4.81
	33	4.70	5.13	4.50	4.78

SOUTHERN GROUND TESTING

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Plate 118



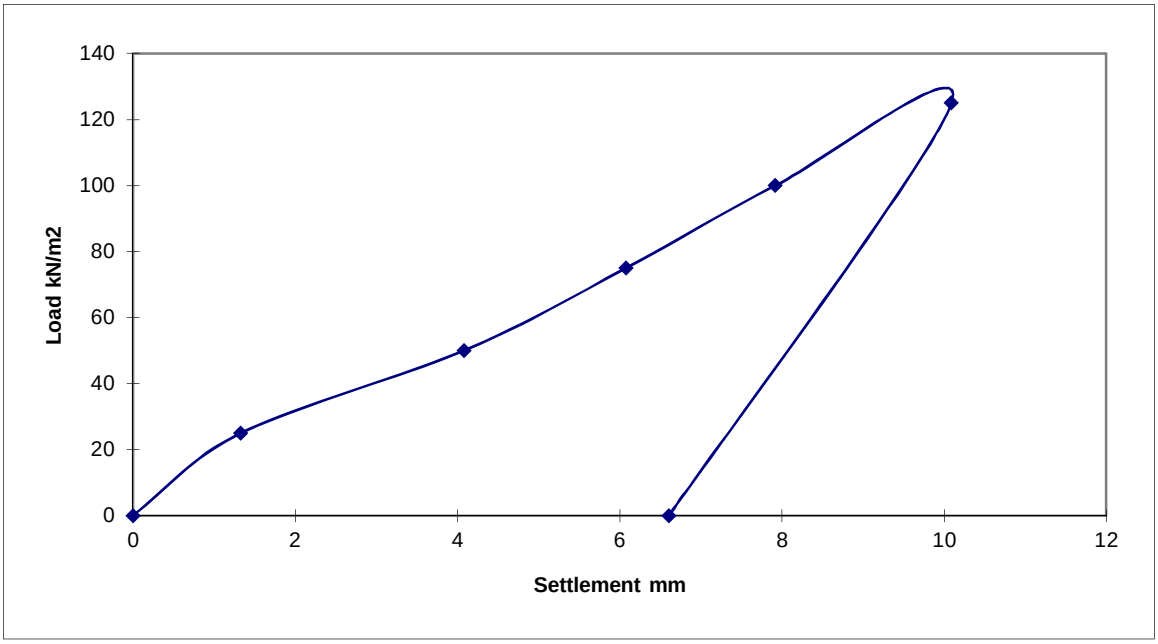
Contract: Merthyr Vale	Date: 11.10.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: P119	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Brown clayey sandy gravel

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.33	25	6
4.08	50	12
6.08	75	18
7.92	100	28
10.09	125	42
6.61	0	46



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale	Date: 27.09.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

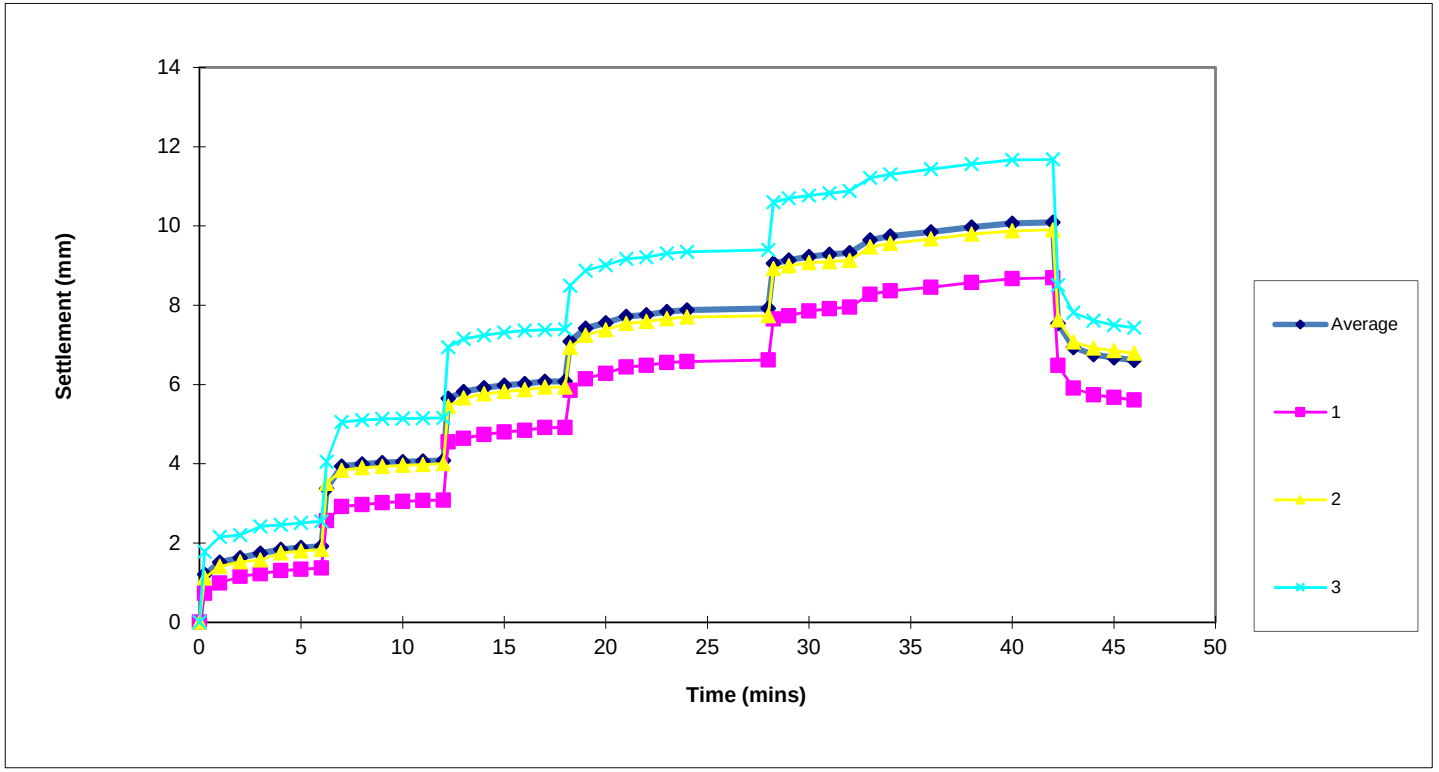
Contract: Merthyr Vale | Date: 27.09.18

Test Reference: P119 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2	0	0	0	0	0
Load	0.25	0.73	1.12	1.78	1.21
	1	0.99	1.41	2.15	1.52
	2	1.16	1.52	2.20	1.63
	3	1.22	1.57	2.42	1.74
	4	1.30	1.75	2.46	1.84
	5	1.34	1.80	2.51	1.88
	6	1.37	1.84	2.55	1.92
50kN/m^2	6.25	2.56	3.50	4.05	3.37
Load	7	2.92	3.83	5.05	3.93
	8	2.97	3.90	5.10	3.99
	9	3.02	3.93	5.13	4.03
	10	3.05	3.96	5.14	4.05
	11	3.07	3.98	5.15	4.07
	12	3.08	4.00	5.16	4.08
75kN/m^2	12.25	4.55	5.45	6.94	5.65
Load	13	4.64	5.66	7.15	5.82
	14	4.74	5.76	7.24	5.91
	15	4.80	5.82	7.31	5.98
	16	4.84	5.87	7.36	6.02
	17	4.91	5.93	7.38	6.07
	18	4.91	5.93	7.39	6.08
100kN/m^2	18.25	5.85	6.93	8.49	7.09
Load	19	6.14	7.24	8.87	7.42
	20	6.28	7.38	9.01	7.56
	21	6.44	7.54	9.17	7.72
	22	6.48	7.59	9.21	7.76
	23	6.55	7.66	9.31	7.84
	24	6.58	7.70	9.35	7.88
	28	6.62	7.73	9.40	7.92
125kN/m^2	28.25	7.65	8.92	10.60	9.06
Load	29	7.73	8.99	10.70	9.14
	30	7.85	9.07	10.77	9.23
	31	7.91	9.10	10.83	9.28
	32	7.95	9.13	10.88	9.32
	33	8.27	9.47	11.21	9.65
	34	8.36	9.56	11.30	9.74
	36	8.45	9.67	11.43	9.85
	38	8.57	9.79	11.56	9.97
	40	8.67	9.87	11.67	10.07
	42	8.69	9.90	11.68	10.09
0kN/m^2	42.25	6.48	7.63	8.51	7.54
Unload	43	5.91	7.07	7.81	6.93
	44	5.74	6.92	7.61	6.76
	45	5.67	6.85	7.50	6.67
	46	5.61	6.79	7.43	6.61

Southern Gound Testing

Plate Load Test Settlement v Time Plot	Test Reference: P119



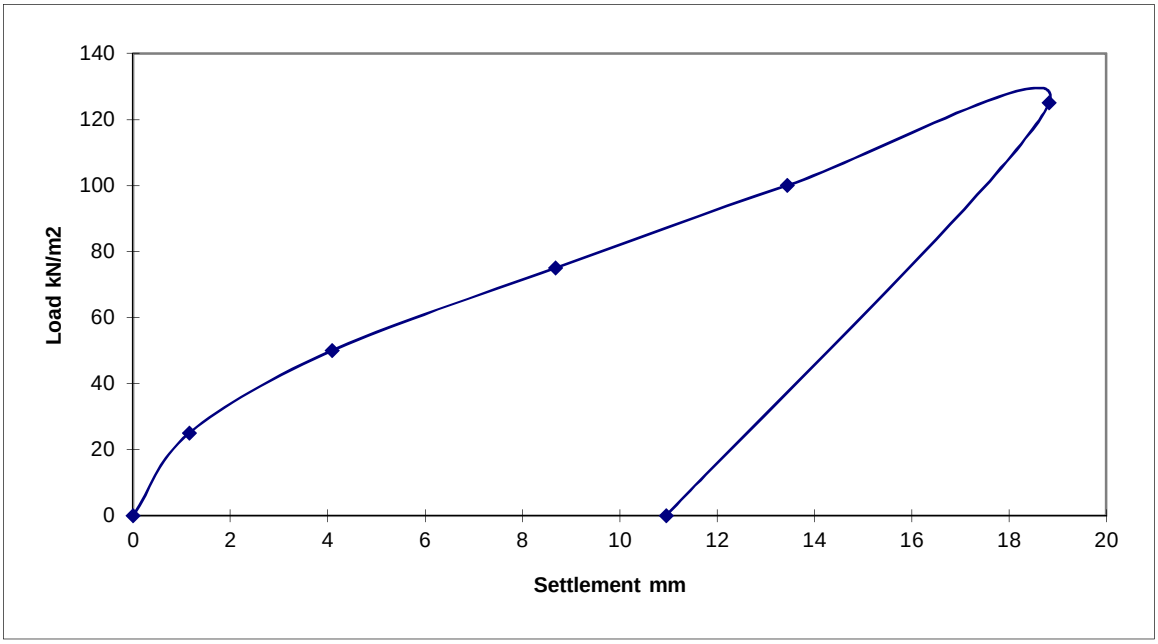
Contract:	Date:
Merthyr Vale	27.09.28

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: P120	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Brown clayey sandy gravel

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.16	25	6
4.09	50	14
8.68	75	27
13.44	100	40
18.82	125	50
10.96	0	52



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale	Date: 27.09.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

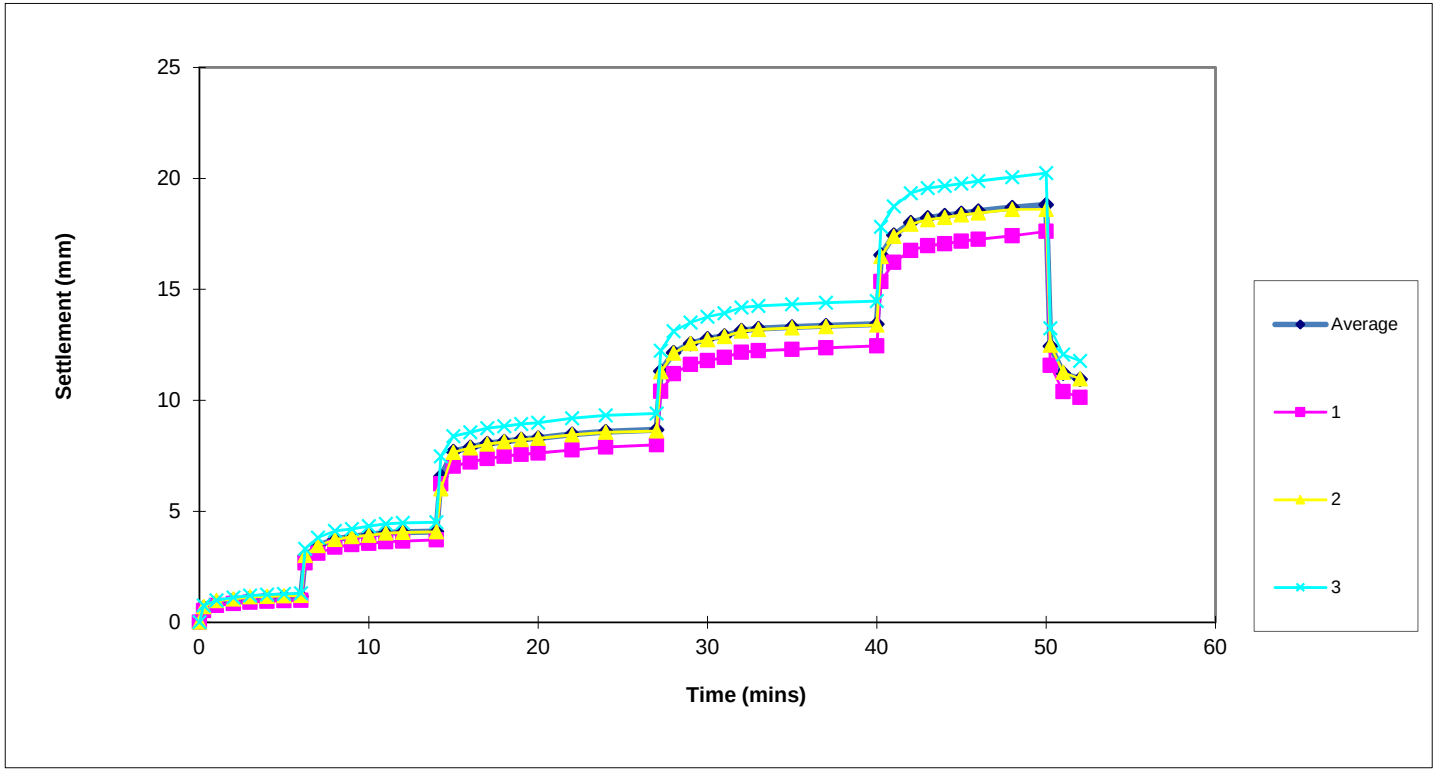
Contract: Merthyr Vale | Date: 27.09.18

Test Reference: P120 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2	0	0	0	0	0
Load	0.25	0.53	0.70	0.75	0.66
	1	0.75	0.97	0.99	0.90
	2	0.84	1.05	1.11	1.00
	3	0.90	1.14	1.21	1.08
	4	0.95	1.16	1.25	1.12
	5	0.97	1.19	1.28	1.15
	6	0.98	1.21	1.30	1.16
50kN/m^2	6.25	2.68	3.00	3.31	3.00
Load	7	3.11	3.45	3.82	3.46
	8	3.38	3.72	4.12	3.74
	9	3.49	3.85	4.21	3.85
	10	3.55	3.92	4.34	3.94
	11	3.63	4.01	4.43	4.02
	12	3.66	4.04	4.47	4.06
	14	3.71	4.07	4.50	4.09
75kN/m^2	14.25	6.23	6.00	7.48	6.57
Load	15	7.03	7.65	8.38	7.69
	16	7.22	7.85	8.56	7.88
	17	7.37	8.03	8.75	8.05
	18	7.48	8.13	8.83	8.15
	19	7.57	8.23	8.94	8.25
	20	7.62	8.28	8.99	8.30
	22	7.77	8.45	9.20	8.47
	24	7.89	8.56	9.32	8.59
	27	8.00	8.62	9.41	8.68
100kN/m^2	27.25	10.41	11.29	12.23	11.31
Load	28	11.20	12.12	13.12	12.15
	29	11.61	12.55	13.50	12.55
	30	11.79	12.73	13.77	12.76
	31	11.93	12.87	13.92	12.91
	32	12.16	13.11	14.18	13.15
	33	12.23	13.19	14.26	13.23
	35	12.30	13.26	14.33	13.30
	37	12.37	13.32	14.40	13.36
	40	12.45	13.39	14.47	13.44
125kN/m^2	40.25	15.35	16.48	17.82	16.55
Load	41	16.22	17.39	18.74	17.45
	42	16.75	17.93	19.33	18.00
	43	16.96	18.14	19.56	18.22
	44	17.06	18.24	19.66	18.32
	45	17.17	18.35	19.77	18.43
	46	17.26	18.44	19.88	18.53
	48	17.42	18.60	20.05	18.69
	50	17.61	18.60	20.24	18.82
0kN/m^2	50.25	11.58	12.48	13.25	12.44
Unload	51	10.39	11.25	12.06	11.23
	52	10.13	10.96	11.78	10.96

Southern Gound Testing

Plate Load Test Settlement v Time Plot	Test Reference: P120



Contract:	Date:
Merthyr Vale	27.09.28

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 121	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Yellow Brown Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.10	25	4
2.62	50	8
4.63	75	13
6.62	100	19
9.61	125	26
5.18	0	31

Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

SGT
SOUTHERN GROUND TESTING

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 11.10.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Merthyr Vale | Date: 11.10.18

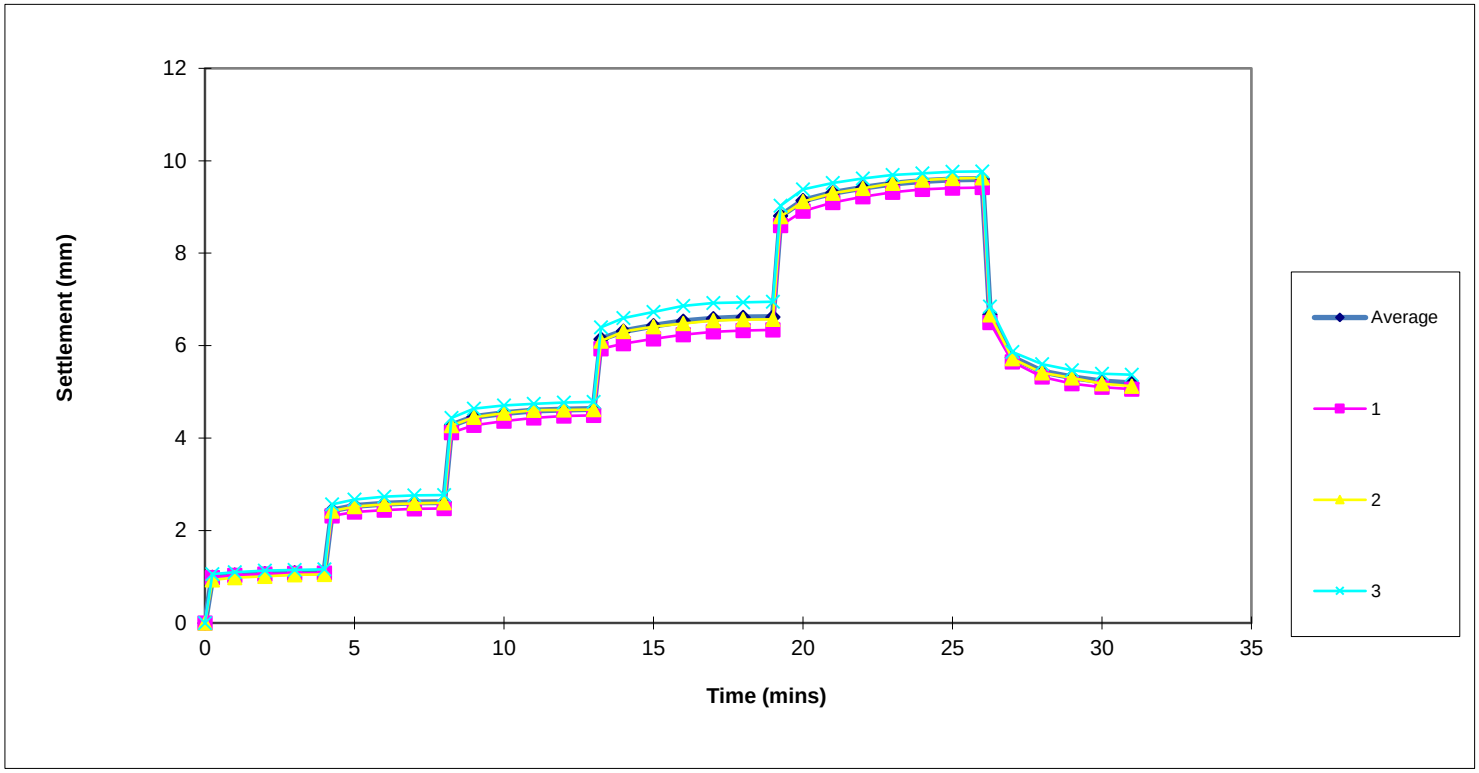
Test Reference: Plate 121 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	0.98	0.93	1.06	0.99
	1	1.03	0.98	1.10	1.04
	2	1.06	1.01	1.13	1.07
	3	1.07	1.04	1.15	1.09
	4	1.08	1.05	1.16	1.10
50kN/m^2 Load	4.25	2.32	2.42	2.57	2.44
	5	2.40	2.52	2.67	2.53
	6	2.44	2.57	2.73	2.58
	7	2.47	2.59	2.76	2.61
	8	2.48	2.60	2.77	2.62
75kN/m^2 Load	8.25	4.12	4.27	4.44	4.28
	9	4.28	4.45	4.64	4.46
	10	4.37	4.54	4.71	4.54
	11	4.44	4.60	4.74	4.59
	12	4.48	4.61	4.77	4.62
	13	4.49	4.62	4.78	4.63
100kN/m^2 Load	13.25	5.93	6.10	6.40	6.14
	14	6.04	6.31	6.60	6.32
	15	6.15	6.41	6.73	6.43
	16	6.24	6.48	6.86	6.53
	17	6.30	6.54	6.92	6.59
	18	6.33	6.56	6.94	6.61
	19	6.34	6.57	6.95	6.62
125kN/m^2 Load	19.25	8.60	8.79	9.03	8.81
	20	8.91	9.12	9.38	9.14
	21	9.10	9.30	9.52	9.31
	22	9.22	9.40	9.62	9.41
	23	9.32	9.51	9.69	9.51
	24	9.38	9.58	9.73	9.56
	25	9.41	9.62	9.76	9.60
	26	9.42	9.63	9.77	9.61
0kN/m^2 Unload	26.25	6.50	6.67	6.85	6.67
	27	5.65	5.72	5.86	5.74
	28	5.32	5.41	5.60	5.44
	29	5.18	5.30	5.47	5.32
	30	5.10	5.18	5.39	5.22
	31	5.06	5.12	5.37	5.18

SOUTHERN GROUND TESTING

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Plate 121



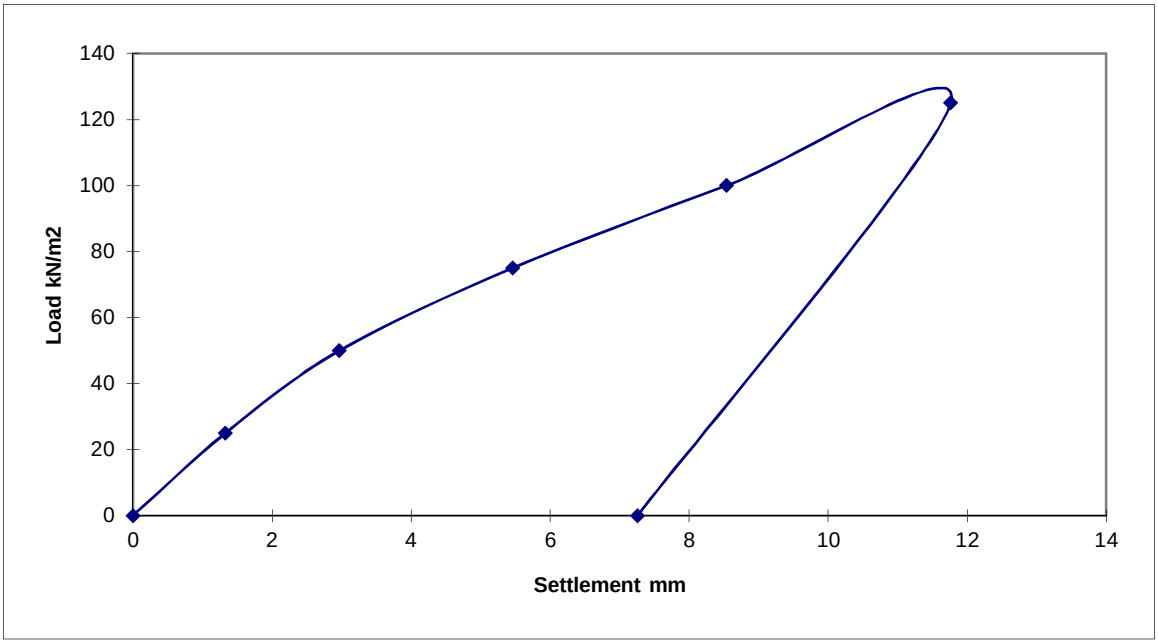
Contract: Merthyr Vale	Date: 11.10.18

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: P122	Test Depth: GL	Plate Diameter: 600mm	Soil Description: Brown clayey sandy gravel

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.33	25	6
2.97	50	14
5.46	75	24
8.54	100	36
11.76	125	50
7.26	0	52



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.01mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthyr Vale	Date: 27.09.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

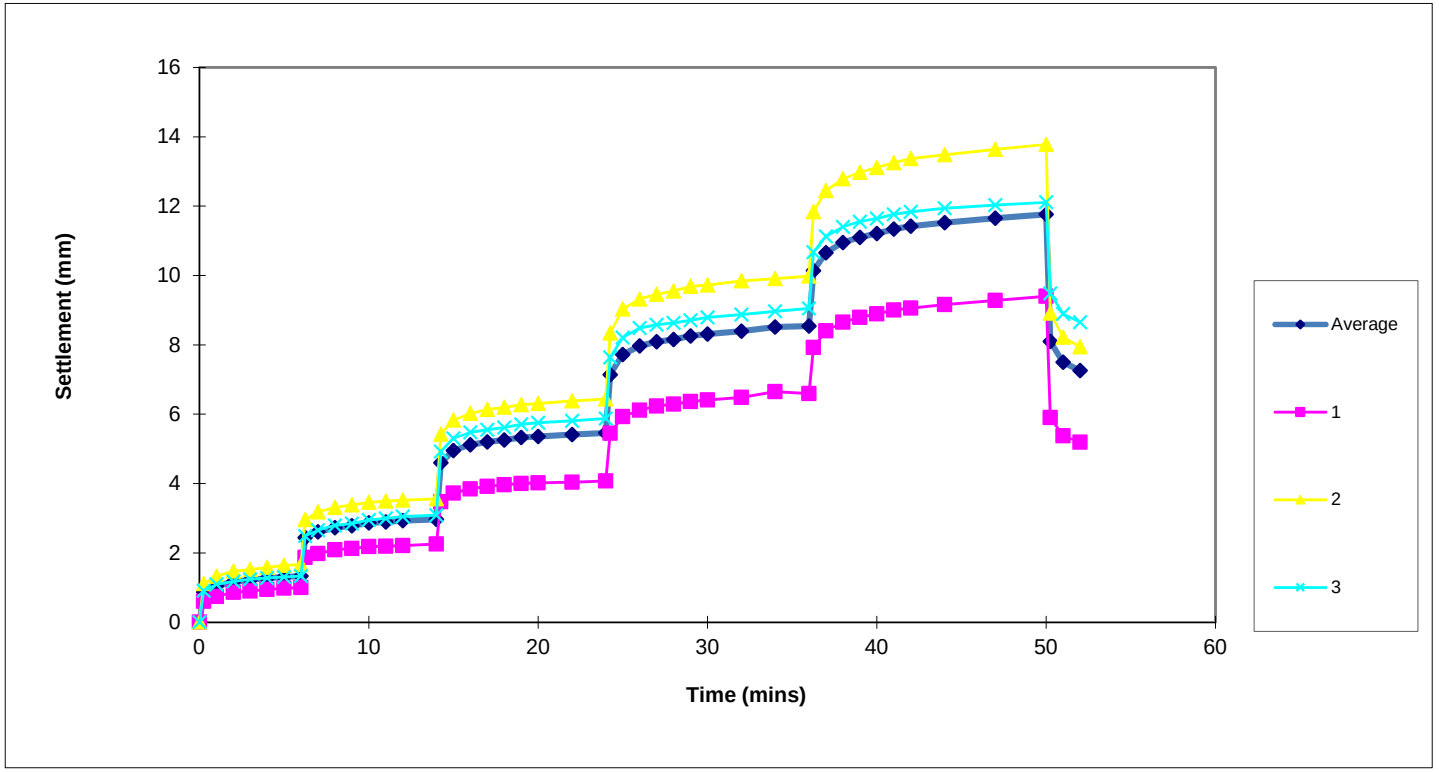
Contract: Merthyr Vale | Date: 27.09.18

Test Reference: P122 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2	0	0	0	0	0
Load	0.25	0.60	1.11	0.91	0.87
	1	0.74	1.32	1.09	1.05
	2	0.86	1.47	1.18	1.17
	3	0.90	1.52	1.24	1.22
	4	0.95	1.58	1.28	1.27
	5	0.98	1.64	1.31	1.31
	6	1.00	1.67	1.33	1.33
50kN/m^2	6.25	1.87	2.96	2.49	2.44
Load	7	1.98	3.18	2.65	2.60
	8	2.09	3.31	2.79	2.73
	9	2.13	3.38	2.85	2.79
	10	2.18	3.46	2.95	2.86
	11	2.19	3.49	2.99	2.89
	12	2.21	3.52	3.05	2.93
	14	2.26	3.56	3.09	2.97
75kN/m^2	14.25	3.47	5.42	4.92	4.60
Load	15	3.72	5.83	5.30	4.95
	16	3.84	6.02	5.48	5.11
	17	3.92	6.13	5.55	5.20
	18	3.96	6.20	5.62	5.26
	19	4.00	6.27	5.71	5.33
	20	4.02	6.31	5.75	5.36
	22	4.04	6.38	5.81	5.41
	24	4.07	6.44	5.87	5.46
100kN/m^2	24.25	5.45	8.34	7.64	7.14
Load	25	5.93	9.03	8.21	7.72
	26	6.11	9.32	8.49	7.97
	27	6.23	9.46	8.58	8.09
	28	6.29	9.55	8.63	8.16
	29	6.36	9.69	8.71	8.25
	30	6.41	9.72	8.79	8.31
	32	6.48	9.84	8.87	8.40
	34	6.65	9.91	8.97	8.51
	36	6.59	9.98	9.05	8.54
125kN/m^2	36.25	7.92	11.84	10.67	10.14
Load	37	8.40	12.45	11.13	10.66
	38	8.65	12.79	11.40	10.95
	39	8.79	12.97	11.55	11.10
	40	8.89	13.11	11.64	11.21
	41	9.00	13.25	11.76	11.34
	42	9.06	13.37	11.84	11.42
	44	9.16	13.48	11.94	11.53
	47	9.28	13.64	12.03	11.65
	50	9.40	13.78	12.11	11.76
0kN/m^2	50.25	5.90	8.91	9.48	8.10
Unload	51	5.38	8.22	8.89	7.50
	52	5.19	7.94	8.65	7.26

Southern Gound Testing

Plate Load Test Settlement v Time Plot	Test Reference: P122



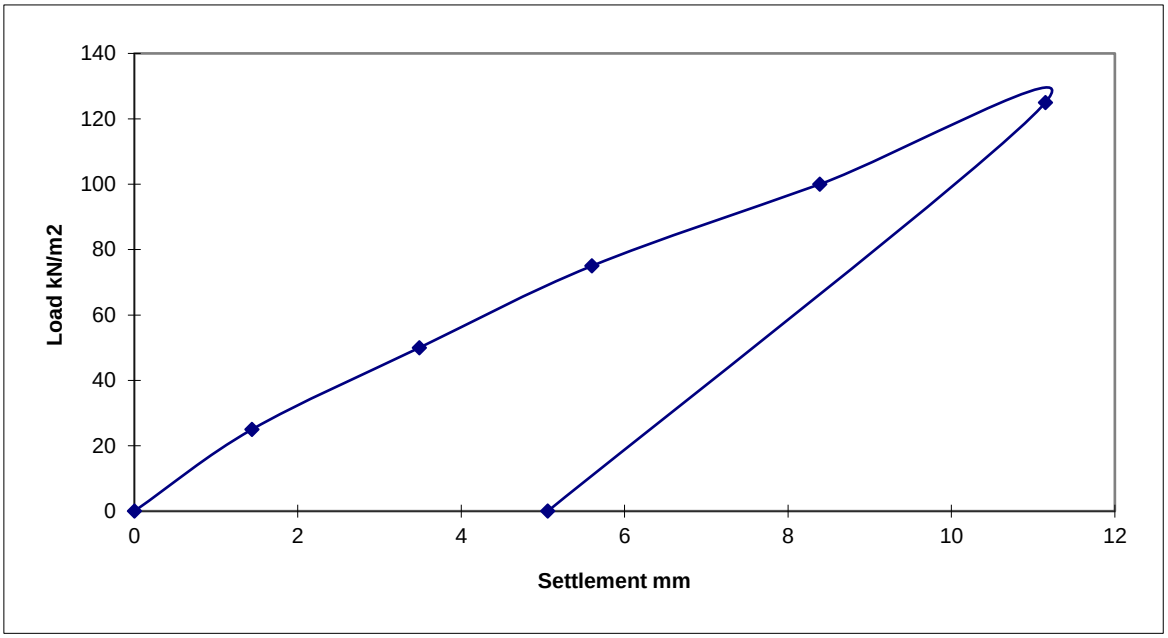
Contract:	Date:
Merthyr Vale	27.09.28

SOUTHERN GROUND TESTING

PLATE LOAD TEST SUMMARY

Test Reference: Plate 123	Test Depth: Surface	Plate Diameter: 600mm	Soil Description: Yellow Brown Clay

Average Plate Settlement (mm)	Load (kN/m^2)	Time (mins)
0	0	0
1.44	25	4
3.49	50	8
5.60	75	13
8.39	100	20
11.15	125	30
5.06	0	35



Notes:

1: Circular steel plate bedded on uniform coarse sand.
2: Tracked excavator used as counter weight.
3: Load applied to plate via hydraulic jack and loading columns.
4: Each load increment applied until plate settlement less than 0.02mm per minute.
5: Plate settlement measured by three travel guages fixed to datum beams.
6: Load measured using electric load cell.

SOUTHERN GROUND TESTING

REMARKS: Test carried out in accordance with BS1377.1990, Part 9.

CONTRACT: Merthry Vale	Date: 11.10.18 Sheet 1 of 1

SOUTHERN GROUND TESTING

Plate Load Test Settlement v Time Data

Contract: Merthyr Vale | Date: 11.10.18

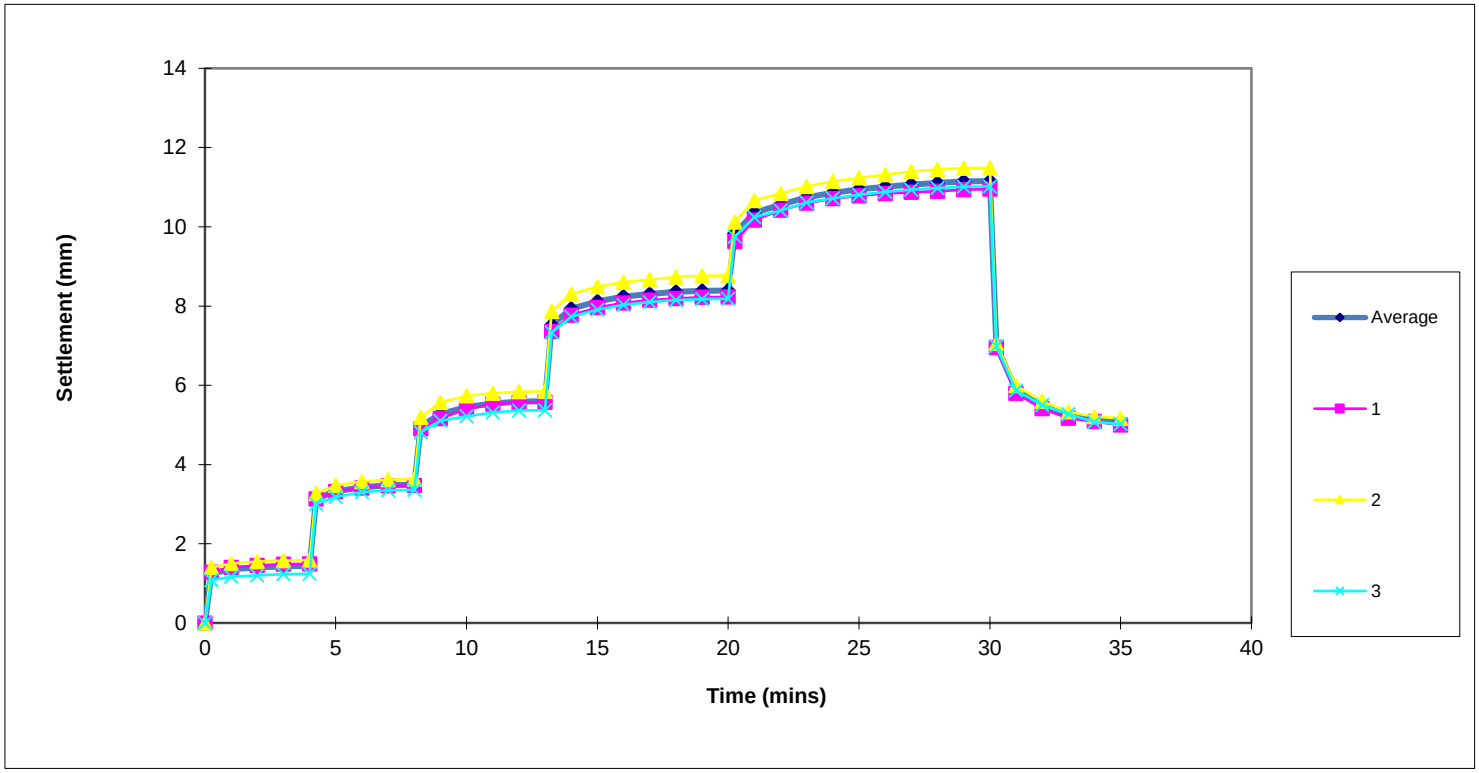
Test Reference: Plate 123 | Test Depth: Surface | Plate Diameter: 600mm | Seating Load: 7.5kN/m^2

		Travel Gauges set on plate			
	Time (mins)	Gauge 1	Gauge 2	Gauge 3	Average Plate Settlement mm
25kN/m^2 Load	0	0	0	0	0
	0.25	1.28	1.40	1.08	1.25
	1	1.40	1.50	1.17	1.36
	2	1.45	1.55	1.20	1.40
	3	1.48	1.57	1.23	1.43
	4	1.49	1.59	1.24	1.44
50kN/m^2 Load	4.25	3.13	3.27	3.00	3.13
	5	3.32	3.47	3.18	3.32
	6	3.41	3.57	3.30	3.43
	7	3.46	3.62	3.35	3.48
	8	3.47	3.63	3.36	3.49
75kN/m^2 Load	8.25	4.90	5.19	4.81	4.97
	9	5.16	5.56	5.10	5.27
	10	5.40	5.73	5.22	5.45
	11	5.52	5.80	5.31	5.54
	12	5.56	5.84	5.36	5.59
	13	5.57	5.85	5.37	5.60
100kN/m^2 Load	13.25	7.36	7.87	7.33	7.52
	14	7.77	8.30	7.73	7.93
	15	7.96	8.49	7.91	8.12
	16	8.08	8.60	8.03	8.24
	17	8.15	8.67	8.10	8.31
	18	8.19	8.73	8.15	8.36
	19	8.22	8.76	8.17	8.38
	20	8.23	8.77	8.18	8.39
125kN/m^2 Load	20.25	9.63	10.12	9.75	9.83
	21	10.17	10.66	10.24	10.36
	22	10.42	10.84	10.41	10.56
	23	10.60	11.02	10.61	10.74
	24	10.71	11.15	10.72	10.86
	25	10.78	11.24	10.81	10.94
	26	10.84	11.32	10.88	11.01
	27	10.87	11.40	10.94	11.07
	28	10.90	11.45	10.98	11.11
	29	10.94	11.48	11.01	11.14
	30	10.95	11.49	11.02	11.15
0kN/m^2 Unload	30.25	6.95	7.06	6.99	7.00
	31	5.80	5.99	5.87	5.89
	32	5.41	5.60	5.50	5.50
	33	5.17	5.33	5.27	5.26
	34	5.09	5.21	5.07	5.12
	35	5.00	5.17	5.02	5.06

SOUTHERN GROUND TESTING

Southern Ground Testing

Plate Load Test Settlement v Time Plot	Test Reference: Plate 123



Contract: Merthyr Vale	Date: 11.10.18

APPENDIX L

CHEMICAL TEST RESULTS – SOILS
(VALIDATION OF REMEDIATION SURFACE)

INTERIM

Andy Figgis
Integral Geotechnique
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e: reception@i2analytical.com

Analytical Report Number : 18-91948

Project / Site name:	Riverside MV	**Samples received on:**	10/07/2018
Your job number:	12235	**Samples instructed on:**	10/07/2018
Your order number:	12235/AF	**Analysis completed by:**	18/07/2018
Report Issue Number:	1	**Report issued on:**	18/07/2018
Samples Analysed:	7 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-91948

Project / Site name: Riverside MV
Your Order No: 12235/AF

Lab Sample Number				997809	997810	997811	997812	997813
Sample Reference				V1	V2	V3	V4	V5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.20	0.10	0.20	0.10
Date Sampled				09/07/2018	09/07/2018	09/07/2018	09/07/2018	09/07/2018
Time Taken				0830	0845	0900	0915	0930
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	1.2	3.9	6.5	3.9	7.1
Total mass of sample received	kg	0.001	NONE	0.52	0.48	0.52	0.50	0.53
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.9	6.9	8.1	7.6	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	370	400	350	350	360
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.019	0.018	0.015	0.018	0.044
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	180	220	160	200	210
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.0	1.4	1.0	1.2	1.0
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.8	3.6	2.8	3.4	3.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.5	9.0	8.1	8.9	6.4
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.43	0.40	0.45	0.40	0.54
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.7	0.6	0.4	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	19	20	19	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	15	14	13	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	15	12	15	19
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	20	22	19	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	21	24	23	22	22
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	59	60	54	64

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Analytical Report Number: 18-91948

Project / Site name: Riverside MV
Your Order No: 12235/AF

Lab Sample Number				997809	997810	997811	997812	997813
Sample Reference				V1	V2	V3	V4	V5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.20	0.10	0.20	0.10
Date Sampled				09/07/2018	09/07/2018	09/07/2018	09/07/2018	09/07/2018
Time Taken				0830	0845	0900	0915	0930
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 18-91948

Project / Site name: Riverside MV
Your Order No: 12235/AF

Lab Sample Number				997814	997815			
Sample Reference				V6	V7			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.20	0.10			
Date Sampled				09/07/2018	09/07/2018			
Time Taken				0945	1000			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	6.9	8.7			
Total mass of sample received	kg	0.001	NONE	0.54	0.50			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.2			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	420	500			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013	0.035			
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0			
Total Sulphur	mg/kg	50	MCERTS	170	220			
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.2	1.2			
Loss on Ignition @ 450°C	%	0.2	MCERTS	3.1	3.2			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	8.7			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.44	0.34			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.8			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.5			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	19			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	26			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	15	27			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	22			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	21			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	56	64			

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Analytical Report Number: 18-91948

Project / Site name: Riverside MV
Your Order No: 12235/AF

Lab Sample Number				997814	997815			
Sample Reference				V6	V7			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.20	0.10			
Date Sampled				09/07/2018	09/07/2018			
Time Taken				0945	1000			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

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Analytical Report Number : 18-91948

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
997809	V1	None Supplied	0.10	Light brown loam and clay with gravel.
997810	V2	None Supplied	0.20	Light brown loam and clay with gravel and vegetation.
997811	V3	None Supplied	0.10	Light brown loam and clay with gravel.
997812	V4	None Supplied	0.20	Light brown loam and clay with vegetation and gravel.
997813	V5	None Supplied	0.10	Brown loam and sand with gravel.
997814	V6	None Supplied	0.20	Light brown loam and clay with gravel and vegetation.
997815	V7	None Supplied	0.10	Light brown loam and clay with gravel.

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Analytical Report Number : 18-91948

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-91948

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-93369

Project / Site name:	Riverside MV	**Samples received on:**	23/07/2018
Your job number:	12235	**Samples instructed on:**	23/07/2018
Your order number:	12235-AF	**Analysis completed by:**	31/07/2018
Report Issue Number:	1	**Report issued on:**	31/07/2018
Samples Analysed:	6 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-93369

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1005678	1005679	1005680	1005681	1005682
Sample Reference				V44	V45	V46	V47	V48
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00	0.00	0.00	0.00	0.00
Date Sampled				20/07/2018	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Time Taken				0830	0830	0830	0830	0830
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	2.0	3.5	5.5	7.0	3.4
Total mass of sample received	kg	0.001	NONE	0.52	0.48	0.51	0.49	0.51
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	7.9	8.0	7.4	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	310	290	230	300	260
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.045	0.020	0.015	0.032	0.019
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	140	170	120	200	140
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	1.1	0.3	1.3	1.2
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.2	2.9	1.6	3.2	3.0
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.39
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.78
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.70
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.44
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.48
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.54
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.45
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.31
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.36
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	4.69
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.0	8.4	5.1	8.0	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.66	0.75	0.71	0.50	0.93
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.4	0.4	0.7	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	19	18	17	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	13	11	16	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	17	18	18	13	36
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	23	23	19	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	21	20	26	22	20
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	64	61	48	100

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Analytical Report Number: 18-93369

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1005678	1005679	1005680	1005681	1005682
Sample Reference				V44	V45	V46	V47	V48
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00	0.00	0.00	0.00	0.00
Date Sampled				20/07/2018	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Time Taken				0830	0830	0830	0830	0830
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	7.4
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	17
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	2.1
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	12
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	20
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	34

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Analytical Report Number: 18-93369

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1005683				
Sample Reference				V49				
Sample Number				None Supplied				
Depth (m)				0.00				
Date Sampled				20/07/2018				
Time Taken				0830				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	9.0				
Total mass of sample received	kg	0.001	NONE	0.48				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	350				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.059				
Sulphide	mg/kg	1	MCERTS	< 1.0				
Total Sulphur	mg/kg	50	MCERTS	190				
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.4				
Loss on Ignition @ 450°C	%	0.2	MCERTS	3.3				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.46				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	35				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	25				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	44				

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Analytical Report Number: 18-93369

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1005683				
Sample Reference				V49				
Sample Number				None Supplied				
Depth (m)				0.00				
Date Sampled				20/07/2018				
Time Taken				0830				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

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Analytical Report Number : 18-93369

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1005678	V44	None Supplied	0.00	Brown sand with gravel.
1005679	V45	None Supplied	0.00	Brown sand with gravel.
1005680	V46	None Supplied	0.00	Brown clay and sand with gravel and vegetation.
1005681	V47	None Supplied	0.00	Brown sand with gravel.
1005682	V48	None Supplied	0.00	Brown sand with gravel.
1005683	V49	None Supplied	0.00	Brown sandy loam with gravel.

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Analytical Report Number : 18-93369

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS

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Analytical Report Number : 18-93369

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 18-94093

Project / Site name:	Riverside MV	**Samples received on:**	27/07/2018
Your job number:	12235	**Samples instructed on:**	27/07/2018
Your order number:	12235-AF	**Analysis completed by:**	06/08/2018
Report Issue Number:	1	**Report issued on:**	06/08/2018
Samples Analysed:	9 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-94093

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1009947	1009948	1009949	1009950	1009951
Sample Reference				V32	V35	V37	V38	V39
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				26/07/2018	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Time Taken				0930	0945	1000	1015	1030
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	7.6	11	7.4	4.9	6.4
Total mass of sample received	kg	0.001	NONE	0.50	0.54	0.55	0.53	0.51
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.1	6.8	7.2	7.3	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	390	400	250	260	280
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.034	0.031	0.020	0.024	0.027
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	240	230	130	150	130
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.7	1.6	0.5	0.4	0.5
Loss on Ignition @ 450°C	%	0.2	MCERTS	4.6	4.1	2.1	2.2	2.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.0	9.7	4.0	5.1	5.2
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.60	0.40	0.70	0.77	0.71
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.8	0.6	0.6	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.4
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	18	20	23	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	12	8.2	13	8.3
Lead (aqua regia extractable)	mg/kg	1	MCERTS	15	16	9.2	15	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	19	20	23	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.2	< 1.0	< 1.0	1.3
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	24	23	39	31	24
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	61	60	47	54	59

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Analytical Report Number: 18-94093

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1009947	1009948	1009949	1009950	1009951
Sample Reference				V32	V35	V37	V38	V39
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				26/07/2018	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Time Taken				0930	0945	1000	1015	1030
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	17	8.8	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	17	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	15	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	15	< 10	< 10	< 10

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Analytical Report Number: 18-94093

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1009952	1009953	1009954	1009955	
Sample Reference				V40	V41	V42	V43	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.10	0.10	0.10	
Date Sampled				26/07/2018	26/07/2018	26/07/2018	26/07/2018	
Time Taken				1045	1100	1110	1120	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	3.8	3.1	5.7	9.3	
Total mass of sample received	kg	0.001	NONE	0.52	0.54	0.55	0.51	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6	7.2	7.3	6.6	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	360	370	310	460	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.071	0.026	0.020	0.029	
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Total Sulphur	mg/kg	50	MCERTS	170	200	160	270	
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.4	1.3	0.6	1.8	
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.0	3.6	2.3	4.4	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.1	8.4	6.0	11	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.74	0.49	0.70	0.49	
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.8	0.5	0.7	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	18	20	20	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	10	12	8.7	14	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	15	18	18	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	19	20	19	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	35	22	23	23	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	60	87	62	

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Analytical Report Number: 18-94093

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1009952	1009953	1009954	1009955	
Sample Reference				V40	V41	V42	V43	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.10	0.10	0.10	
Date Sampled				26/07/2018	26/07/2018	26/07/2018	26/07/2018	
Time Taken				1045	1100	1110	1120	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	

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Analytical Report Number : 18-94093

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1009947	V32	None Supplied	0.10	Brown loam and sand with gravel and vegetation.
1009948	V35	None Supplied	0.10	Brown loam and clay with vegetation.
1009949	V37	None Supplied	0.10	Brown sand with gravel.
1009950	V38	None Supplied	0.10	Brown sand with gravel.
1009951	V39	None Supplied	0.10	Brown loam and clay with gravel.
1009952	V40	None Supplied	0.10	Brown sandy clay with gravel.
1009953	V41	None Supplied	0.10	Brown sandy loam with gravel.
1009954	V42	None Supplied	0.10	Brown sandy loam with gravel.
1009955	V43	None Supplied	0.10	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 18-94093

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-94093

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 18-96064

Project / Site name:	Riverside MV	**Samples received on:**	13/08/2018
Your job number:	12235	**Samples instructed on:**	13/08/2018
Your order number:	12235-AF	**Analysis completed by:**	22/08/2018
Report Issue Number:	1	**Report issued on:**	22/08/2018
Samples Analysed:	12 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-96064

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1021368	1021369	1021370	1021371	1021372
Sample Reference				V20	V23	V24	V26	V27
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				09/08/2018	09/08/2018	09/08/2018	09/08/2018	09/08/2018
Time Taken				1100	1100	1100	1100	1100
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	3.3	5.0	7.3	8.3	3.7
Total mass of sample received	kg	0.001	NONE	0.47	0.40	0.46	0.47	0.49
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.4	7.3	7.1	8.1	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	1700	850	460	3000	1700
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.052	0.055	0.045	0.075	0.17
Sulphide	mg/kg	1	MCERTS	1.1	1.0	< 1.0	< 1.0	2.3
Total Sulphur	mg/kg	50	MCERTS	450	340	220	640	560
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.2	1.5	1.7	0.3	0.9
Loss on Ignition @ 450°C	%	0.2	MCERTS	3.2	3.7	3.5	2.1	2.8
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.19	0.48	0.18	2.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.48	< 0.05	0.89
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.32	0.55	0.29	4.0
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.29	0.44	0.24	3.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.17	0.24	< 0.05	1.8
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.12	0.20	< 0.05	1.3
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.21	0.31	< 0.05	1.9
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.07	0.09	< 0.05	0.93
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.18	0.23	< 0.05	1.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.81
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.82
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	1.55	3.02	< 0.80	19.5
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	11	9.5	18	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.57	0.53	0.48	1.1	0.86
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.4	0.3	0.4	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.7	0.5
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	18	19	15	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	20	15	44	33
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	21	16	50	34
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	20	20	30	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.3	1.1	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	18	20	22	17	19
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	52	49	50	63	57

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Analytical Report Number: 18-96064

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1021368	1021369	1021370	1021371	1021372
Sample Reference				V20	V23	V24	V26	V27
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				09/08/2018	09/08/2018	09/08/2018	09/08/2018	09/08/2018
Time Taken				1100	1100	1100	1100	1100
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	10	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	8.6	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	20	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	2.2	4.9	2.7	3.7
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	10	11	23
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	15	15	24	12	40
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	19	20	40	26	67

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Analytical Report Number: 18-96064

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1021373	1021374	1021375	1021376	1021377
Sample Reference				V28	V29	V30	V31	V33
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				09/08/2018	09/08/2018	09/08/2018	09/08/2018	09/08/2018
Time Taken				1100	1100	1100	1100	1100
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	5.4	9.5	2.3	1.2	4.7
Total mass of sample received	kg	0.001	NONE	0.51	0.51	0.49	0.52	0.48
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	8.4	8.0	8.0	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	2900	1700	2100	1500	3000
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.042	0.066	0.055	0.088	0.067
Sulphide	mg/kg	1	MCERTS	7.0	< 1.0	< 1.0	1.6	1.1
Total Sulphur	mg/kg	50	MCERTS	730	610	630	460	700
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.6	0.3	1.1	1.4	0.5
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.3	2.4	2.7	3.7	2.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.23	0.24	1.5	0.22	0.30
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.47	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.2	0.30	4.5	0.35	0.56
Pyrene	mg/kg	0.05	MCERTS	1.1	0.23	3.6	0.28	0.46
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.71	< 0.05	2.4	0.17	0.24
Chrysene	mg/kg	0.05	MCERTS	0.51	< 0.05	1.8	0.13	0.25
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.86	< 0.05	2.9	< 0.05	0.27
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.27	< 0.05	0.97	< 0.05	0.15
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.67	< 0.05	2.4	< 0.05	0.24
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.29	< 0.05	1.2	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.35	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.28	< 0.05	1.2	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	6.04	< 0.80	23.2	1.15	2.47
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	17	15	12	18
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.83	1.2	0.67	0.62	0.88
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.4	0.4	0.4	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.7	0.5	0.3	0.7
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	16	14	15	12
Copper (aqua regia extractable)	mg/kg	1	MCERTS	38	43	35	24	40
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34	39	30	23	38
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	29	21	21	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	14	18	16	21	14
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	45	62	46	51	47

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Analytical Report Number: 18-96064

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1021373	1021374	1021375	1021376	1021377
Sample Reference				V28	V29	V30	V31	V33
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				09/08/2018	09/08/2018	09/08/2018	09/08/2018	09/08/2018
Time Taken				1100	1100	1100	1100	1100
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	16	< 8.0	13	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	20	< 10	16	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	3.3	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	25	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	16	< 10	56	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	24	< 10	84	< 10	< 10

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Analytical Report Number: 18-96064

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1021378	1021379			
Sample Reference				V34	V36			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.10	0.10			
Date Sampled				09/08/2018	09/08/2018			
Time Taken				1100	1100			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	3.6	4.0			
Total mass of sample received	kg	0.001	NONE	0.53	0.49			
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite	-			
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected			
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-			
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	7.5			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	2400	640			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.048	0.038			
Sulphide	mg/kg	1	MCERTS	5.7	1.2			
Total Sulphur	mg/kg	50	MCERTS	560	290			
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.0	2.0			
Loss on Ignition @ 450°C	%	0.2	MCERTS	3.1	4.2			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	0.51	0.26			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	0.80	0.45			
Pyrene	mg/kg	0.05	MCERTS	0.59	0.40			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.36	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	0.42	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.46	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.15	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.30	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	3.59	1.11			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	10			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.82	0.49			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.5			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	19			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	35	22			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	21			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	18			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	24	25			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51	57			

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-96064

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1021378	1021379			
Sample Reference				V34	V36			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.10	0.10			
Date Sampled				09/08/2018	09/08/2018			
Time Taken				1100	1100			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	16	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	26	11			

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Analytical Report Number: 18-96064
Project / Site name: Riverside MV
Your Order No: 12235-AF

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1021378	V34	0.10	222	Loose Fibres	**Chrysotile & Amosite**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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Analytical Report Number : 18-96064

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1021368	V20	None Supplied	0.10	Light brown loam and clay with gravel.
1021369	V23	None Supplied	0.10	Light brown loam and clay with gravel.
1021370	V24	None Supplied	0.10	Brown loam and clay with gravel.
1021371	V26	None Supplied	0.10	Brown loam and clay with gravel.
1021372	V27	None Supplied	0.10	Light brown loam and clay with gravel and vegetation.
1021373	V28	None Supplied	0.10	Light brown loam and clay with gravel.
1021374	V29	None Supplied	0.10	Brown loam and clay with gravel.
1021375	V30	None Supplied	0.10	Brown loam and sand with gravel and vegetation.
1021376	V31	None Supplied	0.10	Grey loam and clay with gravel.
1021377	V33	None Supplied	0.10	Brown loam and clay with gravel.
1021378	V34	None Supplied	0.10	Brown loam and clay with gravel.
1021379	V36	None Supplied	0.10	Brown loam and clay with gravel.

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Analytical Report Number : 18-96064

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

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Analytical Report Number : 18-96064

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-97749

Project / Site name:	Riverside MV	**Samples received on:**	24/08/2018
Your job number:	12235	**Samples instructed on:**	24/08/2018
Your order number:	12235-AF	**Analysis completed by:**	04/09/2018
Report Issue Number:	1	**Report issued on:**	04/09/2018
Samples Analysed:	5 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-97749

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1031125	1031126	1031127	1031128	1031129
Sample Reference				V18	V19	V21	V22	V25
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				21/08/2018	21/08/2018	21/08/2018	21/08/2018	21/08/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.6	9.0	9.4	8.9	7.3
Total mass of sample received	kg	0.001	NONE	0.40	0.40	0.40	0.40	0.40
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	8.2	8.3	8.9	6.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	1900	3500	460	1600	2300
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.071	0.053	0.038	0.11	0.082
Sulphide	mg/kg	1	MCERTS	2.6	< 1.0	< 1.0	2.1	3.2
Total Sulphur	mg/kg	50	MCERTS	720	720	190	610	840
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	0.5	0.6	0.5	0.3
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.7	2.0	2.6	2.0	2.0
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.2	< 0.05	< 0.05	0.36	0.63
Anthracene	mg/kg	0.05	MCERTS	0.40	< 0.05	< 0.05	0.11	0.26
Fluoranthene	mg/kg	0.05	MCERTS	2.3	< 0.05	< 0.05	0.58	1.1
Pyrene	mg/kg	0.05	MCERTS	1.8	< 0.05	< 0.05	0.43	0.97
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.0	< 0.05	< 0.05	0.34	0.53
Chrysene	mg/kg	0.05	MCERTS	0.82	< 0.05	< 0.05	0.31	0.45
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.2	< 0.05	< 0.05	0.42	0.59
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	0.15	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.83	< 0.05	< 0.05	0.27	0.46
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.38	< 0.05	< 0.05	0.13	0.25
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.46	< 0.05	< 0.05	0.16	0.28
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	10.6	< 0.80	< 0.80	3.26	5.79
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	12	13	12	18
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.85	0.72	1.1	0.70	0.85
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.4	0.8	1.5	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.2	0.5	0.3	0.8
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	14	28	27	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	33	30	26	22	46
Lead (aqua regia extractable)	mg/kg	1	MCERTS	41	42	25	22	45
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	22	27	19	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	17	30	21	16
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	57	120	68	90

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Analytical Report Number: 18-97749

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1031125	1031126	1031127	1031128	1031129
Sample Reference				V18	V19	V21	V22	V25
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				21/08/2018	21/08/2018	21/08/2018	21/08/2018	21/08/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	15

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Analytical Report Number : 18-97749

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1031125	V18	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
1031126	V19	None Supplied	0.10	Brown loam and clay with gravel.
1031127	V21	None Supplied	0.10	Brown loam and sand with gravel and vegetation.
1031128	V22	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
1031129	V25	None Supplied	0.10	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 18-97749

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

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Analytical Report Number : 18-97749

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 18-10501

Project / Site name:	Riverside MV	**Samples received on:**	17/09/2018
Your job number:	12235	**Samples instructed on:**	17/09/2018
Your order number:	12235-AF	**Analysis completed by:**	25/09/2018
Report Issue Number:	1	**Report issued on:**	25/09/2018
Samples Analysed:	10 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-10501

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1046492	1046493	1046494	1046495	1046496
Sample Reference				V8	V9	V10	V11	V12
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.20	0.10	0.20
Date Sampled				13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	9.6	10	12	9.6
Total mass of sample received	kg	0.001	NONE	0.52	0.45	0.51	0.55	0.53
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.8	8.3	8.7	7.6	7.1
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	1200	1300	2000	2000	580
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.20	0.066	0.062	0.060	0.081
Sulphide	mg/kg	1	MCERTS	8.7	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	410	470	620	580	180
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.4	0.3	1.0	1.1	0.3
Loss on Ignition @ 450°C	%	0.2	MCERTS	1.9	2.1	2.8	3.3	1.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.24	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.72	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.57	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.33	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.30	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.44	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.09	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.18	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	2.87	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.6	8.0	12	10	4.9
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.84	0.92	0.80	0.74	0.77
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	0.7	0.4	0.6	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.4	0.5	0.4	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	22	17	17	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	28	35	34	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	35	39	39	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	23	21	20	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.1	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	26	22	23	21	35
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	73	57	78	75	43

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Analytical Report Number: 18-10501

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1046492	1046493	1046494	1046495	1046496
Sample Reference				V8	V9	V10	V11	V12
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.20	0.10	0.20
Date Sampled				13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 18-10501

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1046497	1046498	1046499	1046500	1046501
Sample Reference				V13	V14	V15	V16	V17
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.20	0.10	0.20	0.10
Date Sampled				13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	10	11	9.4	7.2
Total mass of sample received	kg	0.001	NONE	0.53	0.51	0.56	0.52	0.48
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	7.8	7.8	7.9	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	340	390	420	480	390
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.037	0.025	0.059	0.059	0.029
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.1	< 1.0
Total Sulphur	mg/kg	50	MCERTS	130	150	280	240	210
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.6	0.6	0.9	1.0	1.0
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.8	2.6	2.8	3.4	3.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.32
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.33	0.64
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.24	0.44
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.33
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.30
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.26
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.25
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	2.76
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.1	10	12	7.6	9.7
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.74	0.65	0.61	0.64	0.65
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	0.8	0.6	0.7	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.9	0.3	0.6	< 0.2	0.3
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	21	15	18	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	25	24	23	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	67	210	24	84
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	40	23	21	18	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	37	24	16	19	18
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	160	73	56	59	72

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Analytical Report Number: 18-10501

Project / Site name: Riverside MV
Your Order No: 12235-AF

Lab Sample Number				1046497	1046498	1046499	1046500	1046501
Sample Reference				V13	V14	V15	V16	V17
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.20	0.10	0.20	0.10
Date Sampled				13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-10501

Project / Site name: Riverside MV

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1046492	V8	None Supplied	0.20	Brown loam and clay with gravel.
1046493	V9	None Supplied	0.10	Brown loam and clay with gravel.
1046494	V10	None Supplied	0.20	Brown loam and clay with gravel.
1046495	V11	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
1046496	V12	None Supplied	0.20	Brown loam and clay with gravel.
1046497	V13	None Supplied	0.10	Brown loam and clay with gravel.
1046498	V14	None Supplied	0.20	Brown loam and clay with gravel.
1046499	V15	None Supplied	0.10	Light brown loam and clay with gravel and vegetation.
1046500	V16	None Supplied	0.20	Brown loam and sand with gravel and vegetation.
1046501	V17	None Supplied	0.10	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 18-10501

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS

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Analytical Report Number : 18-10501

Project / Site name: Riverside MV

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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APPENDIX M

SUMMARY OF CHEMICAL TEST RESULTS – SOILS (VALIDATION OF REMEDIATION SURFACE)

INTERIM

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12235
Site: Riverside Merthyr Vale Colliery
Soil Type: Engineered Fill - Remediation Surface
Soil Organic Matter: 1%

METALS AND SEMI-METALS

No.	Location	Depth (m)	Arsenic (mg/kg)	Boron (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (Elemental) (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
1	V20	0.10	12	0.4	0.57	< 0.2	16	< 4.0	22	21	< 0.3	20	< 1.0	18	52
2	V23	0.10	11	0.4	0.53	< 0.2	18	< 4.0	20	21	< 0.3	20	< 1.0	20	49
3	V24	0.10	9.5	0.3	0.48	< 0.2	19	< 4.0	15	16	< 0.3	20	1.3	22	50
4	V26	0.10	18	0.4	1.1	0.7	15	< 4.0	44	50	< 0.3	30	1.1	17	63
5	V27	0.10	15	0.4	0.86	0.5	16	< 4.0	33	34	< 0.3	26	< 1.0	19	57
6	V28	0.10	18	0.4	0.83	0.6	12	< 4.0	38	34	< 0.3	24	< 1.0	14	45
7	V29	0.10	17	0.4	1.2	0.7	16	< 4.0	43	39	< 0.3	29	< 1.0	18	62
8	V30	0.10	15	0.4	0.67	0.5	14	< 4.0	35	30	< 0.3	21	< 1.0	16	46
9	V31	0.10	12	0.4	0.62	0.3	15	< 4.0	24	23	< 0.3	21	< 1.0	21	51
10	V33	0.10	18	< 0.2	0.88	0.7	12	< 4.0	40	38	< 0.3	24	< 1.0	14	47
11	V34	0.10	13	0.4	0.82	0.3	17	< 4.0	35	29	< 0.3	22	< 1.0	24	51
12	V36	0.10	10	0.5	0.49	< 0.2	19	< 4.0	22	21	< 0.3	18	< 1.0	25	57
13	V32	0.10	8.0	0.8	0.60	< 0.2	20	< 4.0	13	15	< 0.3	22	< 1.0	24	61
14	V35	0.10	9.7	0.8	0.40	< 0.2	18	< 4.0	12	16	< 0.3	19	1.2	23	60
15	V37	0.10	4.0	0.6	0.70	< 0.2	20	< 4.0	8.2	9.2	< 0.3	20	< 1.0	39	47
16	V38	0.10	5.1	0.6	0.77	< 0.2	23	< 4.0	13	15	< 0.3	23	< 1.0	31	54
17	V39	0.10	5.2	0.4	0.71	0.4	18	< 4.0	8.3	18	< 0.3	21	1.3	24	59
18	V40	0.10	4.1	0.7	0.74	< 0.2	24	< 4.0	10	12	< 0.3	25	< 1.0	35	57
19	V41	0.10	8.4	0.8	0.49	< 0.2	18	< 4.0	12	15	< 0.3	19	< 1.0	22	60
20	V42	0.10	6.0	0.5	0.70	< 0.2	20	< 4.0	8.7	18	< 0.3	20	< 1.0	23	87
21	V43	0.10	11	0.7	0.49	< 0.2	20	< 4.0	14	18	< 0.3	19	< 1.0	23	62
22	V44	0.00	6.0	0.4	0.66	< 0.2	17	< 4.0	13	17	< 0.3	18	< 1.0	21	57
23	V45	0.00	8.4	0.4	0.75	< 0.2	19	< 4.0	13	18	< 0.3	23	< 1.0	20	64
24	V46	0.00	5.1	0.4	0.71	< 0.2	18	< 4.0	11	18	< 0.3	23	< 1.0	26	61
25	V47	0.00	8.0	0.7	0.50	< 0.2	17	< 4.0	16	13	< 0.3	19	< 1.0	22	48
26	V48	0.00	12	0.5	0.93	< 0.2	20	< 4.0	19	36	< 0.3	28	< 1.0	20	100
27	V49	0.00	7.2	0.7	0.46	< 0.2	35	< 4.0	12	14	< 0.3	27	< 1.0	25	44
28	V1	0.10	9.5	0.7	0.43	< 0.2	18	< 4.0	14	11	< 0.3	20	< 1.0	21	54
29	V2	0.20	9.0	0.7	0.40	< 0.2	19	< 4.0	15	15	< 0.3	20	< 1.0	24	59
30	V3	0.10	8.1	0.6	0.45	< 0.2	20	< 4.0	14	12	< 0.3	22	< 1.0	23	60
31	V4	0.20	8.9	0.4	0.40	< 0.2	19	< 4.0	13	15	< 0.3	19	< 1.0	22	54
32	V5	0.10	6.4	1.2	0.54	< 0.2	17	< 4.0	15	19	< 0.3	19	< 1.0	22	64
33	V6	0.20	9.3	0.8	0.44	< 0.2	18	< 4.0	18	15	< 0.3	20	< 1.0	22	56
34	V7	0.10	8.7	0.8	0.34	0.5	19	< 4.0	26	27	< 0.3	22	< 1.0	21	64
35	V18	0.10	14	0.8	0.85	0.4	19	< 4.0	33	41	< 0.3	24	< 1.0	22	68
36	V19	0.10	12	0.4	0.72	0.2	14	< 4.0	30	42	< 0.3	22	< 1.0	17	57
37	V21	0.10	13	0.8	1.1	0.5	28	< 4.0	26	25	< 0.3	27	< 1.0	30	120
38	V22	0.10	12	1.5	0.70	0.3	27	< 4.0	22	22	< 0.3	19	< 1.0	21	68
39	V25	0.10	18	0.5	0.85	0.8	14	< 4.0	46	45	< 0.3	23	< 1.0	16	90
40	V8	0.20	9.6	1.5	0.84	0.4	29	< 4.0	25	19	< 0.3	25	< 1.0	26	73
41	V9	0.10	8.0	0.7	0.92	0.4	22	< 4.0	28	35	< 0.3	23	< 1.0	22	57
42	V10	0.20	12	0.4	0.80	0.5	17	< 4.0	35	39	< 0.3	21	1.1	23	78
43	V11	0.10	10	0.6	0.74	0.4	17	< 4.0	34	39	< 0.3	20	< 1.0	21	75
44	V12	0.20	4.9	0.6	0.77	< 0.2	26	< 4.0	17	14	< 0.3	25	< 1.0	35	43
45	V13	0.10	6.1	1.3	0.74	0.9	26	< 4.0	32	29	< 0.3	40	< 1.0	37	160
46	V14	0.20	10	0.8	0.65	0.3	21	< 4.0	25	67	< 0.3	23	< 1.0	24	73
47	V15	0.10	12	0.6	0.61	0.6	15	< 4.0	24	210	< 0.3	21	< 1.0	16	56
48	V16	0.20	7.6	0.7	0.64	< 0.2	18	< 4.0	23	24	< 0.3	18	< 1.0	19	59
49	V17	0.10	9.7	1.1	0.65	0.3	18	< 4.0	26	84	< 0.3	20	< 1.0	18	72
	Screening Criteria Value		37.0	290.0	1.7	11.0	-	6.0	2400.0	200.0	1.2	130.0	250.0	410.0	3700.0
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	-	S4UL	S4UL	C4SL	S4UL	S4UL	S4UL	S4UL	S4UL

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Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12235

POLYAROMATIC HYDROCARBONS (PAH)

Site: Riverside Merthyr Vale Colliery

Soil Type: Engineered Fill - Remediation Surface

Soil Organic Matter: 1%

No.	Location	Depth (m)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(ghi)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(ah)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(123cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
1	V20	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2	V23	0.10	< 0.05	< 0.05	< 0.05	0.17	0.18	0.21	< 0.05	0.07	0.12	< 0.05	0.32	< 0.05	< 0.05	< 0.05	0.19	0.29
3	V24	0.10	< 0.05	< 0.05	0.48	0.24	0.23	0.31	< 0.05	0.09	0.20	< 0.05	0.55	< 0.05	< 0.05	< 0.05	0.48	0.44
4	V26	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.29	< 0.05	< 0.05	< 0.05	0.18	0.24
5	V27	0.10	< 0.05	< 0.05	0.89	1.8	1.7	1.9	0.82	0.93	1.3	< 0.05	4.0	< 0.05	0.81	< 0.05	2.1	3.3
6	V28	0.10	< 0.05	< 0.05	< 0.05	0.71	0.67	0.86	0.28	0.27	0.51	< 0.05	1.2	< 0.05	0.29	< 0.05	0.23	1.1
7	V29	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.30	< 0.05	< 0.05	< 0.05	0.24	0.23
8	V30	0.10	< 0.05	< 0.05	0.47	2.4	**2.4**	**2.9**	1.2	0.97	1.8	**0.35**	4.5	< 0.05	1.2	< 0.05	1.5	3.6
9	V31	0.10	< 0.05	< 0.05	< 0.05	0.17	< 0.05	< 0.05	< 0.05	< 0.05	0.13	< 0.05	0.35	< 0.05	< 0.05	< 0.05	0.22	0.28
10	V33	0.10	< 0.05	< 0.05	< 0.05	0.24	0.24	0.27	< 0.05	0.15	0.25	< 0.05	0.56	< 0.05	< 0.05	< 0.05	0.30	0.46
11	V34	0.10	< 0.05	< 0.05	< 0.05	0.36	0.30	0.46	< 0.05	0.15	0.42	< 0.05	0.80	< 0.05	< 0.05	< 0.05	0.51	0.59
12	V36	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.45	< 0.05	< 0.05	< 0.05	0.26	0.40
13	V32	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
14	V35	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
15	V37	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
16	V38	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
17	V39	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
18	V40	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
19	V41	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
20	V42	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
21	V43	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
22	V44	0.00	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
23	V45	0.00	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
24	V46	0.00	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
25	V47	0.00	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
26	V48	0.00	< 0.05	< 0.05	< 0.05	0.44	0.45	0.54	0.36	0.24	0.48	< 0.05	0.78	< 0.05	0.31	< 0.05	0.39	0.70
27	V49	0.00	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
28	V1	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
29	V2	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
30	V3	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
31	V4	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
32	V5	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
33	V6	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
34	V7	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
35	V18	0.10	< 0.05	< 0.05	0.40	1.0	0.83	1.2	0.46	0.24	0.82	< 0.05	2.3	< 0.05	0.38	< 0.05	1.2	1.8
36	V19	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
37	V21	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
38	V22	0.10	< 0.05	< 0.05	0.11	0.34	0.27	0.42	0.16	0.15	0.31	< 0.05	0.58	< 0.05	0.13	< 0.05	0.36	0.43
39	V25	0.10	< 0.05	< 0.05	0.26	0.53	0.46	0.59	0.28	0.24	0.45	< 0.05	1.1	< 0.05	0.25	< 0.05	0.63	0.97
40	V8	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
41	V9	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
42	V10	0.20	< 0.05	< 0.05	< 0.05	0.33	0.18	0.44	< 0.05	0.09	0.30	< 0.05	0.72	< 0.05	< 0.05	< 0.05	0.24	0.57
43	V11	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
44	V12	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
45	V13	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
46	V14	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
47	V15	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
48	V16	0.20	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.33	< 0.05	< 0.05	< 0.05	< 0.05	0.24
49	V17	0.10	< 0.05	< 0.05	< 0.05	0.33	0.25	0.26	< 0.05	0.22	0.30	< 0.05	0.64	< 0.05	< 0.05	< 0.05	0.32	0.44
	Screening Criteria Value		**210.0**	**170.0**	**2400.0**	**7.2**	**2.2**	**2.6**	**320.0**	**77.0**	**15.0**	**0.2**	**280.0**	**170.0**	**27.0**	**2.3**	**95.0**	**620.0**
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL

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Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12235

Site: Riverside Merthyr Vale Colliery

Soil Type: Engineered Fill - Remediation Surface

Soil Organic Matter: 1%

PETROLEUM HYDROCARBONS

No.	Location	Depth (m)	Aliphatic C5-C6 (mg/kg)	Aliphatic C6-C8 (mg/kg)	Aliphatic C8-C10 (mg/kg)	Aliphatic C10-C12 EPH (mg/kg)	Aliphatic C12-C16 EPH (mg/kg)	Aliphatic C16-C35 EPH (mg/kg)	Aromatic C5-C7 (mg/kg)	Aromatic C7-C8 (mg/kg)	Aromatic C8-C10 (mg/kg)	Aromatic C10-C12 EPH (mg/kg)	Aromatic C12-C16 EPH (mg/kg)	Aromatic C16-C21 EPH (mg/kg)	Aromatic C21-C35 EPH (mg/kg)
1	V20	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	15
2	V23	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	2.2	< 10	15
3	V24	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	4.9	10	24
4	V26	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	19	< 0.001	< 0.001	< 0.001	< 1.0	2.7	11	12
5	V27	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	3.7	23	40
6	V28	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	16
7	V29	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	24	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
8	V30	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	3.3	25	56
9	V31	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	21	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
10	V33	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
11	V34	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	16
12	V36	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
13	V32	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	25	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
14	V35	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	15
15	V37	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
16	V38	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
17	V39	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
18	V40	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
19	V41	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
20	V42	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
21	V43	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
22	V44	0.00	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
23	V45	0.00	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
24	V46	0.00	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
25	V47	0.00	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
26	V48	0.00	< 0.001	< 0.001	< 0.001	< 1.0	7.4	<16	< 0.001	< 0.001	< 0.001	< 1.0	2.1	12	20
27	V49	0.00	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
28	V1	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
29	V2	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
30	V3	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
31	V4	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
32	V5	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
33	V6	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
34	V7	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
35	V18	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
36	V19	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
37	V21	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
38	V22	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
39	V25	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
40	V8	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
41	V9	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
42	V10	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
43	V11	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
44	V12	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
45	V13	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
46	V14	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
47	V15	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
48	V16	0.20	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
49	V17	0.10	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	<16	< 0.001	< 0.001	< 0.001	< 1.0	< 2.0	< 10	< 10
	Screening Criteria Value		42.0	100.0	27.0	130.0	1100.0	65000.0	0.1	130.0	34.0	74.0	140.0	260.0	1100.0
	Source of Screening Criteria Value		S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL

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Intégral Géotechnique

SUMMARY OF LABORATORY SOIL TEST RESULTS

Job No.: 12235

Site: Riverside Merthyr Vale Colliery

Soil Type: Engineered Fill - Remediation Surface

Soil Organic Matter: 1%

INORGANIC CHEMICALS & OTHERS

No.	Location	Depth (m)	Cyanide (mg/kg)	Loss on ignition, dried solids (%)	Moisture content at 30 C (%)	Phenol (mg/kg)	pH (pH units)	Water Soluble Sulphate (g/l)	Sulphate Total as SO4 (mg/kg)	Sulphide (mg/kg)	Total Sulphur (mg/kg)	TOC by Ignition in O2 (%)	Equivalent SOM (%)	Asbestos in Soil	Asbestos Quantification (%)
1	V20	0.10	< 1	3.2	3.3	< 1.0	7.4	0.052	1700	1.1	450	1.2	2.06	Not-detected	-
2	V23	0.10	< 1	3.7	5.0	< 1.0	7.3	0.055	850	1.0	340	1.5	2.58	Not-detected	-
3	V24	0.10	< 1	3.5	7.3	< 1.0	7.1	0.045	460	< 1.0	220	1.7	2.92	Not-detected	-
4	V26	0.10	< 1	2.1	8.3	< 1.0	8.1	0.075	3000	< 1.0	640	0.3	0.52	Not-detected	-
5	V27	0.10	< 1	2.8	3.7	< 1.0	7.9	0.17	1700	2.3	560	0.9	1.55	Not-detected	-
6	V28	0.10	< 1	2.3	5.4	< 1.0	8.1	0.042	2900	7.0	730	0.6	1.03	Not-detected	-
7	V29	0.10	< 1	2.4	9.5	< 1.0	8.4	0.066	1700	< 1.0	610	0.3	0.52	Not-detected	-
8	V30	0.10	< 1	2.7	2.3	< 1.0	8.0	0.055	2100	< 1.0	630	1.1	1.89	Not-detected	-
9	V31	0.10	< 1	3.7	1.2	< 1.0	8.0	0.088	1500	1.6	460	1.4	2.41	Not-detected	-
10	V33	0.10	< 1	2.2	4.7	< 1.0	8.3	0.067	3000	1.1	700	0.5	0.86	Not-detected	-
11	V34	0.10	< 1	3.1	3.6	< 1.0	8.1	0.048	2400	5.7	560	1.0	1.72	**Detected**	< 0.001
12	V36	0.10	< 1	4.2	4.0	< 1.0	7.5	0.038	640	1.2	290	2.0	3.44	Not-detected	-
13	V32	0.10	< 1	4.6	7.6	< 1.0	7.1	0.034	390	< 1.0	240	1.7	2.92	Not-detected	-
14	V35	0.10	< 1	4.1	11	< 1.0	6.8	0.031	400	< 1.0	230	1.6	2.75	Not-detected	-
15	V37	0.10	< 1	2.1	7.4	< 1.0	7.2	0.020	250	< 1.0	130	0.5	0.86	Not-detected	-
16	V38	0.10	< 1	2.2	4.9	< 1.0	7.3	0.024	260	< 1.0	150	0.4	0.69	Not-detected	-
17	V39	0.10	< 1	2.1	6.4	< 1.0	7.5	0.027	280	< 1.0	130	0.5	0.86	Not-detected	-
18	V40	0.10	< 1	2.0	3.8	< 1.0	7.6	0.071	360	< 1.0	170	0.4	0.69	Not-detected	-
19	V41	0.10	< 1	3.6	3.1	< 1.0	7.2	0.026	370	< 1.0	200	1.3	2.24	Not-detected	-
20	V42	0.10	< 1	2.3	5.7	< 1.0	7.3	0.020	310	< 1.0	160	0.6	1.03	Not-detected	-
21	V43	0.10	< 1	4.4	9.3	< 1.0	6.6	0.029	460	< 1.0	270	1.8	3.10	Not-detected	-
22	V44	0.00	< 1	2.2	2.0	< 1.0	8.0	0.045	310	< 1.0	140	0.7	1.20	Not-detected	-
23	V45	0.00	< 1	2.9	3.5	< 1.0	7.9	0.020	290	< 1.0	170	1.1	1.89	Not-detected	-
24	V46	0.00	< 1	1.6	5.5	< 1.0	8.0	0.015	230	< 1.0	120	0.3	0.52	Not-detected	-
25	V47	0.00	< 1	3.2	7.0	< 1.0	7.4	0.032	300	< 1.0	200	1.3	2.24	Not-detected	-
26	V48	0.00	< 1	3.0	3.4	< 1.0	8.0	0.019	260	< 1.0	140	1.2	2.06	Not-detected	-
27	V49	0.00	< 1	3.3	9.0	< 1.0	7.6	0.059	350	< 1.0	190	1.4	2.41	Not-detected	-
28	V1	0.10	< 1	2.8	1.2	< 1.0	6.9	0.019	370	< 1.0	180	1.0	1.72	Not-detected	-
29	V2	0.20	< 1	3.6	3.9	< 1.0	6.9	0.018	400	< 1.0	220	1.4	2.41	Not-detected	-
30	V3	0.10	< 1	2.8	6.5	< 1.0	8.1	0.015	350	< 1.0	160	1.0	1.72	Not-detected	-
31	V4	0.20	< 1	3.4	3.9	< 1.0	7.6	0.018	350	< 1.0	200	1.2	2.06	Not-detected	-
32	V5	0.10	< 1	3.1	7.1	< 1.0	7.7	0.044	360	< 1.0	210	1.0	1.72	Not-detected	-
33	V6	0.20	< 1	3.1	6.9	< 1.0	7.5	0.013	420	< 1.0	170	1.2	2.06	Not-detected	-
34	V7	0.10	< 1	3.2	8.7	< 1.0	7.2	0.035	500	< 1.0	220	1.2	2.06	Not-detected	-
35	V18	0.10	< 1	2.7	9.6	< 1.0	8.1	0.071	1900	2.6	720	0.7	1.20	Not-detected	0.00
36	V19	0.10	< 1	2.0	9.0	< 1.0	8.2	0.053	3500	< 1.0	720	0.5	0.86	Not-detected	0.00
37	V21	0.10	< 1	2.6	9.4	< 1.0	8.3	0.038	460	< 1.0	190	0.6	1.03	Not-detected	0.00
38	V22	0.10	< 1	2.0	8.9	< 1.0	8.9	0.11	1600	2.1	610	0.5	0.86	Not-detected	0.00
39	V25	0.10	< 1	2.0	7.3	< 1.0	6.9	0.082	2300	3.2	840	0.3	0.52	Not-detected	0.00
40	V8	0.20	< 1	1.9	12	< 1.0	9.8	0.20	1200	8.7	410	0.4	0.69	Not-detected	0.00
41	V9	0.10	< 1	2.1	9.6	< 1.0	8.3	0.066	1300	< 1.0	470	0.3	0.52	Not-detected	0.00
42	V10	0.20	< 1	2.8	10	< 1.0	8.7	0.062	2000	< 1.0	620	1.0	1.72	Not-detected	0.00
43	V11	0.10	< 1	3.3	12	< 1.0	7.6	0.060	2000	< 1.0	580	1.1	1.89	Not-detected	0.00
44	V12	0.20	< 1	1.2	9.6	< 1.0	7.1	0.081	580	< 1.0	180	0.3	0.52	Not-detected	0.00
45	V13	0.10	< 1	2.8	11	< 1.0	8.1	0.037	340	< 1.0	130	0.6	1.03	Not-detected	0.00
46	V14	0.20	< 1	2.6	10	< 1.0	7.8	0.025	390	< 1.0	150	0.6	1.03	Not-detected	0.00
47	V15	0.10	< 1	2.8	11	< 1.0	7.8	0.059	420	< 1.0	280	0.9	1.55	Not-detected	0.00
48	V16	0.20	< 1	3.4	9.4	< 1.0	7.9	0.059	480	1.1	240	1.0	1.72	Not-detected	0.00
49	V17	0.10	< 1	3.3	7.2	< 1.0	7.9	0.029	390	< 1.0	210	1.0	1.72	Not-detected	0.00
	Screening Criteria Value		**34.0**	-	-	**280.0**	-	-	-	-	-	-	-	-	**0.001**
	Source of Screening Criteria Value		ATRISK	-	-	S4UL	-	-	-	-	-	-	-	-	IOM

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Intégral Géotechnique

FIGURES

INTERIM

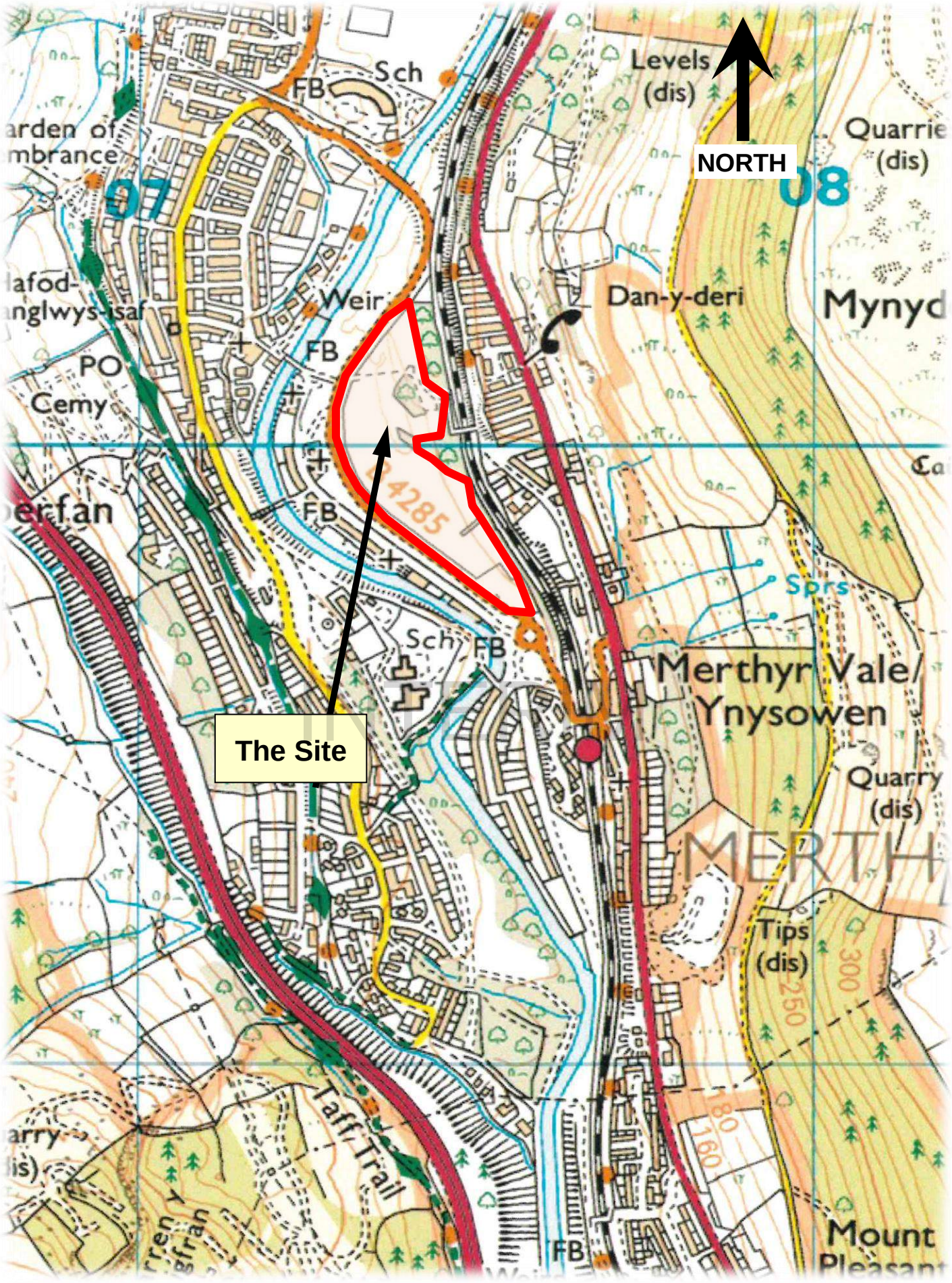

FIGURE 1 - Site Location Plan

Project Riverside, Merthyr Vale (12235)

Intégral Géotechnique

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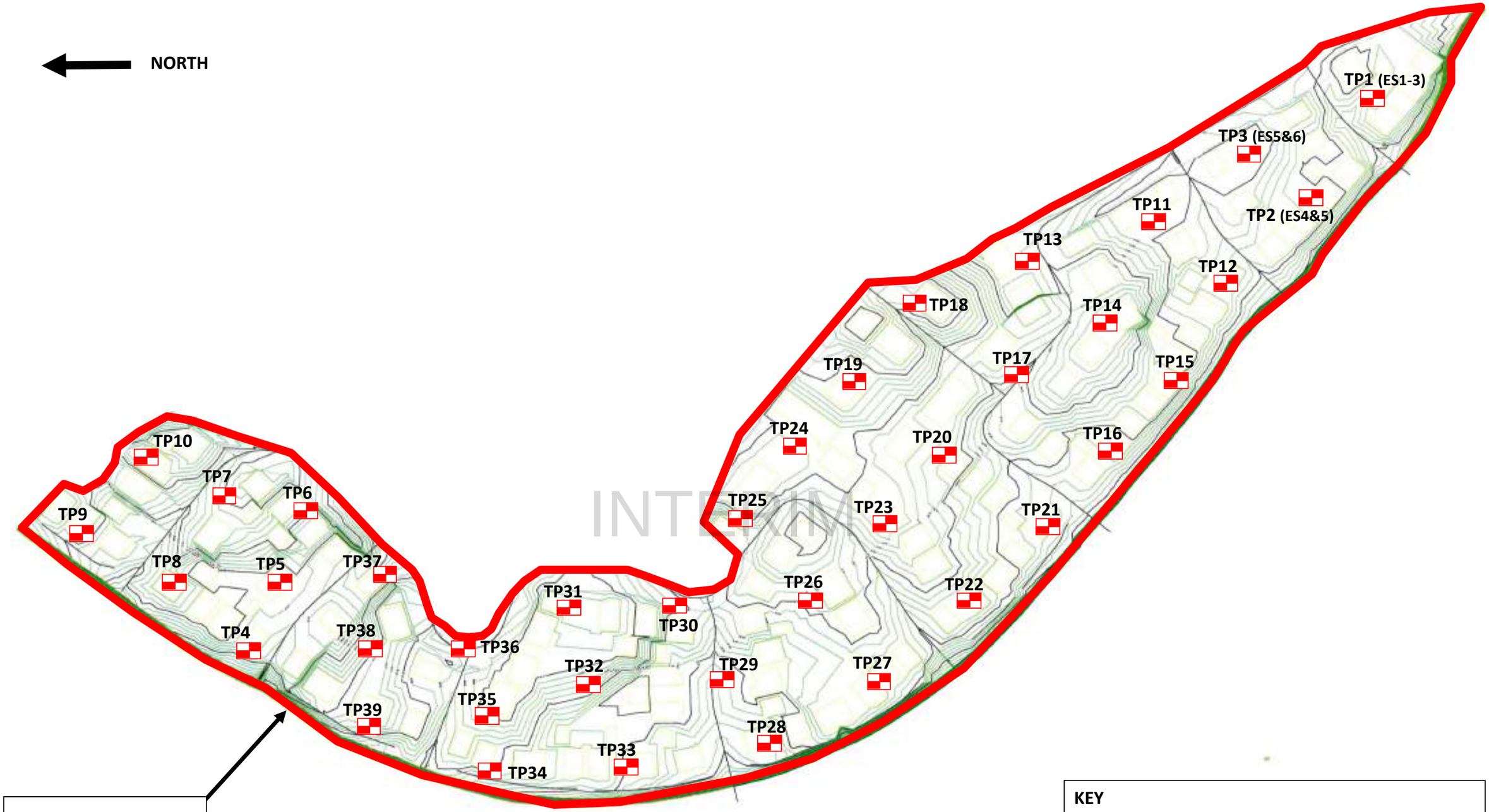
Caerphilly
CF83 2AX
Tel: 029 2080 7991
Fax: 029 2086 2176

NORTH



Approximate Extent of Turn Compact Earthworks

KEY

Approximate Trial Pit Locations carried out prior to/ concurrent with turn compact earthworks (19 June to 4 July 2018).

FIGURE 2 - Trial Pit Location Plan (Chemical Validation Pre Turn Compact Earthworks)

Project Riverside, Merthyr Vale (12235)

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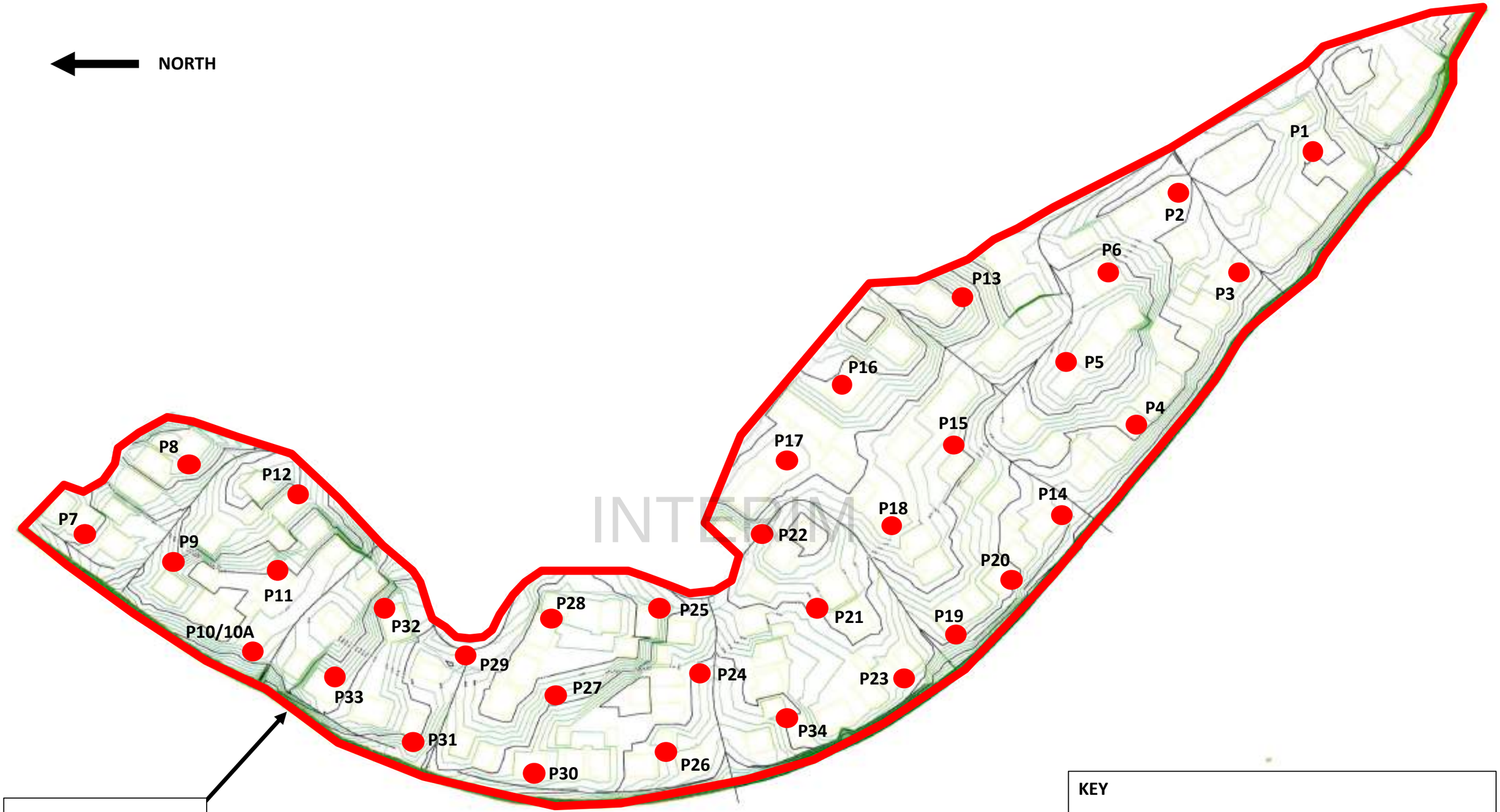

Approximate Extent of Turn Compact Earthworks

KEY

- Approximate Plate Load location (testing carried out at depths of approximately between 150 and 1600mm below Remediated Surface/Final Earthworks Level)

FIGURE 3 - Plate Load Test Location Plan (Physical Validation Pre Turn Compact Earthworks)

Project Riverside, Merthyr Vale (12235)

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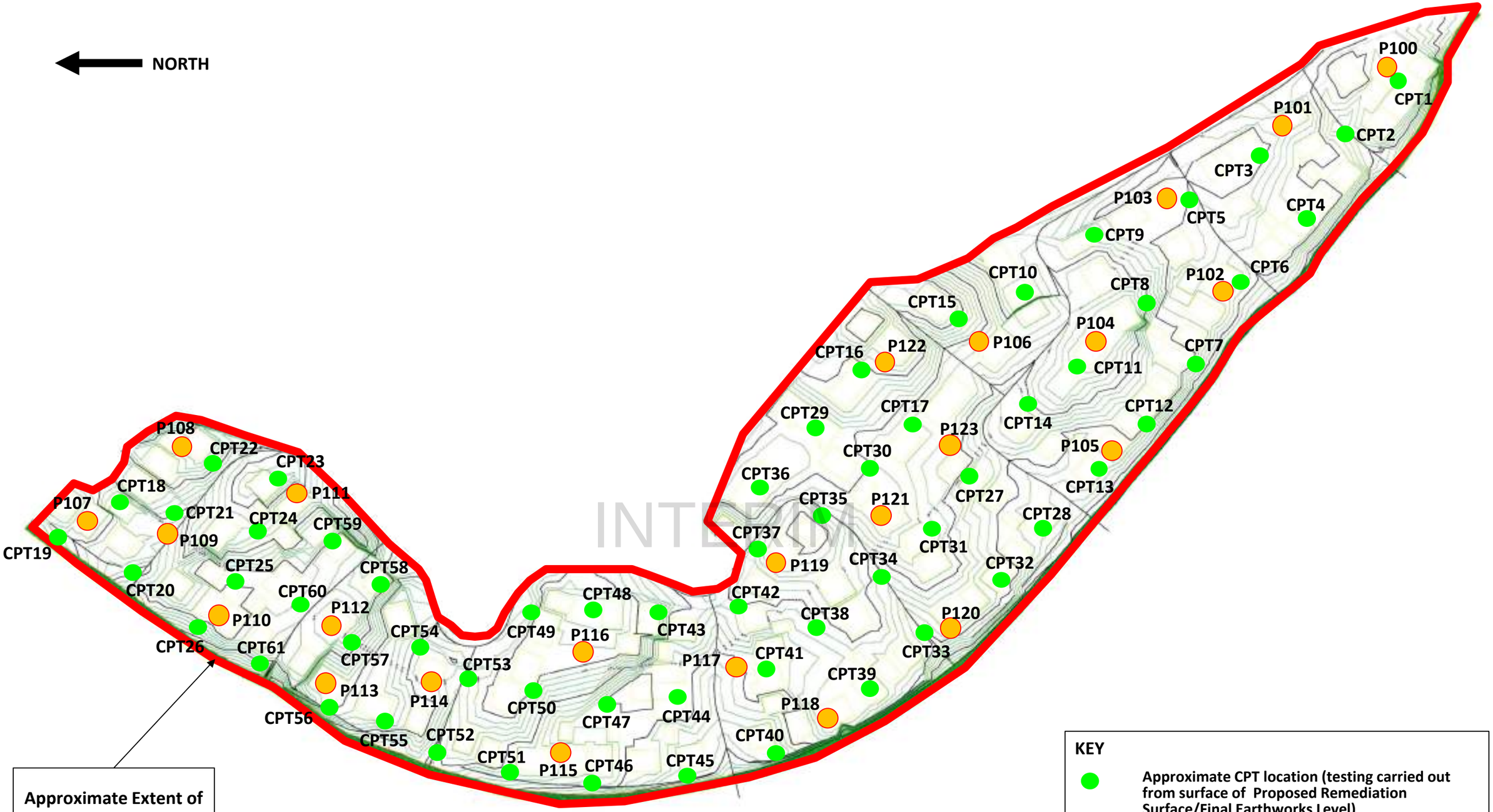

INTERIM

KEY

- Approximate CPT location (testing carried out from surface of Proposed Remediation Surface/Final Earthworks Level)
- Approximate Plate Load location (testing carried out at surface of Proposed Remediation Surface/Final Earthworks Level)

FIGURE 4 - In Situ Test Location Plan (Physical Validation Post Turn Compact Earthworks)

Project Riverside, Merthyr Vale (12235)

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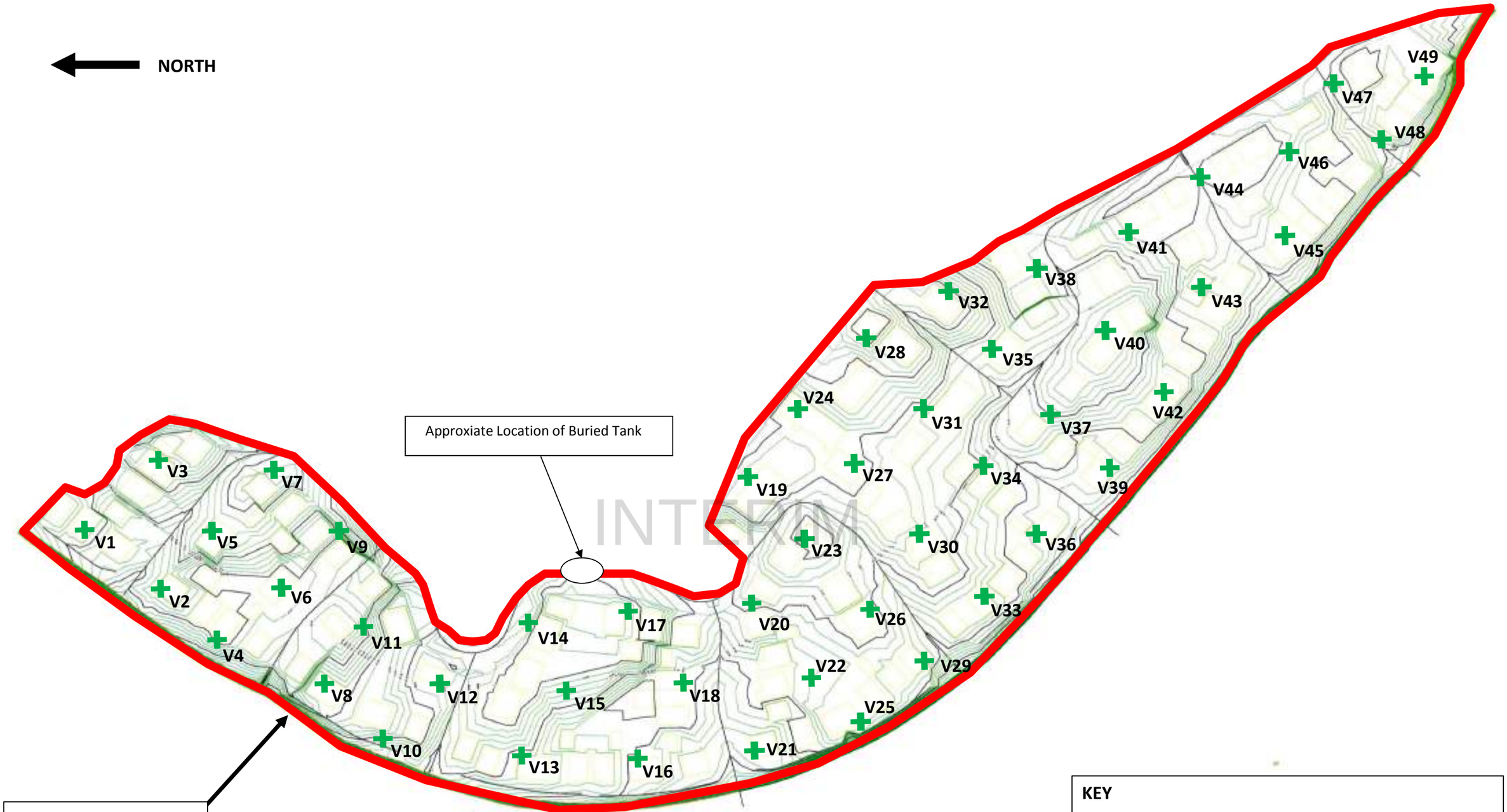

INTERIM

KEY

✚ **Approximate Chemical Sample Locations (25m Grid). Samples taken at depths of approximately between 100 and 200mm below Proposed Remediation Surface/Final Earthworks Level.**

FIGURE 5 - Chemical Sample Grid Location Plan (Chemical Validation Post Turn Compact Earthworks)

Project Riverside, Merthyr Vale (12235)

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