



e3p

Validation Report
New Victoria, Manchester

Reference:14-284-R3-1
Date: November 2021



REMEDIATION AND ENABLING WORKS VALIDATION

New Victoria
Corporation Street
Manchester
M4 4DY

Prepared for:
PP O'Connor



Report Ref: 14-284-R3-1
Date Issued: November 2021

New Victoria, Manchester

Remediation and Enabling Works Validation
November 2021

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1. INTRODUCTION

1.1. BACKGROUND

This report details the remediation and enabling works operations that were undertaken by PP O'Connor under the supervision of E3P to facilitate the preparation of the high-rise residential development at the land to the south of Corporation Street, Manchester; herein referred to as the site.

E3P were appointed by PP O'Connor as independent Geo-Environmental Consultant for the site remediation, preparation / enabling and validation works and the subsequent production of a suitably detailed report to ensure the satisfaction of the relevant planning conditions and geotechnical engineering requirements for Building Control, warranty providers and the future adoption of infrastructure by the Highways Authority and statutory service providers.

It should be noted that the works detailed within this validation report only relate to the remediation and enabling works within residential building footprints plots 1 and 2.

1.2. PROPOSED DEVELOPMENT

The proposed development in line with planning application 111777/F0/2016/C1 has permission to "erection of two residential buildings of a maximum 21 and 26 storeys to accommodate 520 apartments (178 x 1 bed, 286 x 2 bed and 56 x 3 bed apartments) (Use Class C3). Erection of one office building of maximum eight storeys comprising up to 11,647 sq. m (GIA) of office accommodation. Ground floor commercial space (Use Class A1, A2, A3 and B1), lower ground level car parking, access and servicing arrangements, alterations to Corporation Street, new public realm, and other associated works".

E3P has been provided with a draft planning layout plan illustrating the current site boundary and proposed development plan illustrated within Figure 1.1 below;

FIGURE 1.1 SNAPSHOT OF PROPOSED DEVELOPMENT



Summary of Parties Involved

Function/interest	Name of Party
Local Planning Authority	Manchester City Council
Developer	Vinci Construction Ltd / Mus Developments Ltd
Geoenvironmental Consultant	E3P
Main Contractor	Vinci Construction Ltd
Remediation/Enabling Works Contractor	PP O'Connor
Human Health Regulator	Manchester City Council
Controlled Waters and Waste Regulator	Environment Agency
Highways Adoption Authority	Manchester City Council

1.3. PREVIOUS WORKS

The following phases of geoenvironmental investigations have previously been carried out at the site:

- Soil Mechanics 1992 - Ground investigation to inform the proposed redevelopment of the wider Victoria Station as part of the Arena development. Several of the exploratory holes undertaken are located within the New Victoria site boundary.
- Bridgeway Consulting Ltd in 2012 - Ground investigation completed to inform further design of the station redevelopment.
- AEG in 2016 - Development and site specific ground investigation.
- Vertase FLI (Vertase) 2017 - Ground investigation.
- Arup in 2008 - Geotechnical Desk Study report for proposed development southeast of the arena which included the current site.
- Arup in 2016 - Ground investigation report which includes interpretation of results obtained from the 2016 AEG ground investigation. Appendix B of the Arup ground investigation report contains a summary of the historical investigations outlined previously and presents an assessment of the geotechnical and geoenvironmental conditions for development considerations.
- Arup in 2017 -Work Stage 3 Report.
- Arup 2018 - Earthworks and Remediation Performance Specification
- E3P - 14-284-R2 - Geotech Performance Specification - New Victoria Manchester
- 14-284-R1 - Remediation Implementation Plan - New Victoria Manchester



1.4. REGULATORY CORRESPONDENCE

The proposed development in line with planning application 111777/FO/2016/C1 which granted permission for the “erection of two residential buildings of a maximum 21 and 26 storeys to accommodate 520 apartments (178 x 1 bed, 286 x 2 bed and 56 x 3 bed apartments) (Use Class C3). Erection of one office building of maximum eight storeys comprising up to 11,647 sq. m (GIA) of office accommodation. Ground floor commercial space (Use Class A1, A2, A3 and B1), lower ground level car parking, access and servicing arrangements, alterations to Corporation Street, new public realm, and other associated works”.

Condition 21a for phase 1 which included the Earthworks and Remediation Performance Specification prepared by Arup (February 2018) has been discharged.

The planning document states ‘The information is considered to be acceptable in terms of Phase 1 only so Condition 21 part a) will be discharged so long as the development is carried out in accordance with the submitted information. Condition 21 will only be fully discharged when the outstanding information as required by the condition for all phases is submitted to and deemed to be acceptable by the Local Planning Authority’.



2. SUMMARY OF REMEDIATION AND ENABLING WORKS OBJECTIVES

The proposed remediation activities were detailed within the E3P Remediation and Enabling Works Strategy (14-284-r1; dated August 2020) and supplementary supporting documents provided by E3P.

This report has been prepared to document the completion of all necessary land remediation and enabling works and to record the presence of any variation in ground conditions or previously unidentified sources of potential contamination, environmental impact or potential nuisance to the wider environ.

The Remediation and Enabling Works elements are summarised below:

-  RE-1 – Pre-commencement Regulatory Compliance
-  RE-2 – Environment and Nuisance Control
-  RE-3 – Risk to Infrastructure and River Irk (Culverted)
-  RE-4 – Site Clearance Operations
-  RE-5 – Delineation, Excavation and Treatment of Identified Asbestos Impact
-  RE-6 – Excavation, Breaking and Processing of All Above and Below Ground Structures
-  RE-7 – Processing and turnover of Made Ground soils
-  RE-8 – Importation of Bulk Fill
-  RE-9 – Independent Watching Brief Validation
-  RE-10 – Waste Soils Surplus to Requirements

3. SECOND PHASE MITIGATION AND MANAGEMENT – BUILD PHASE

A second post demolition phase of works will be required to ensure the proposed development is constructed in a manner that incorporates the required mitigation measures to ensure the development is compliant with UK Building Regulations and the Local Authority Planning requirements.

These obligations are specified in more detail within Section 5.



4. DETAILED REMEDIATION AND ENABLING WORKS ACTIVITIES

The focus of the remediation and enabling works are to address the contaminant issues previously identified within the site investigations that presented an unacceptable risk to human health following the redevelopment of the site.

For completeness, each of these activities has been discussed below within the context of the actual remediation works that were undertaken on site.

RE-1 – PRE-COMMENCEMENT REGULATORY COMPLIANCE

OVERVIEW OF WORKS

During remediation, works were restricted to between 8.00am and 5.30pm. A road sweeper was present to keep the access routes clean and clear of debris during the importation of materials to site.

Dust monitoring was completed during the start of the remediation and enabling works.

A power washer and bowser were present to dampen down materials throughout the works and during the excavation and delineation of asbestos hotspots.

A Materials Management Plan (MMP) was put in place by E3P, report Ref: 14-284-r2.2, dated November 2020, prior to the commencement of the remediation and enabling works. This was to facilitate the excavation of material, re-use and import to create suitable working platforms for future piling works.

RE-2 – ENVIRONMENT AND NUISANCE CONTROL

OVERVIEW OF WORKS

Management of all works is required so as to ensure that no environmental nuisance is created through dust emissions, noise or vibration levels.

All works are to be completed in a manner so as not to create any structural risk to the adjacent highways and culvert.

Temporary works are to be implemented as necessary to support excavations throughout the duration of the works.

In the event that a complaint is made in respect of dust emissions, noise or vibration levels, remedial measures and a programme of ongoing monitoring should be agreed with the local authority and implemented on site.

RE-3 – RISK TO INFRASTRUCTURE AND RIVER IRK (CULVERTED)

PHOTOGRAPHS

Plate 1

OVERVIEW OF WORKS

Site works were completed in a manner that ensured no risk or disturbance to the adjacent infrastructure. The River Irk culvert prior to the commencement of works the culvert location was marked out on-site, timber crossing point was constructed to spread the load of plant crossing.

All onsite liver services and the onsite culvert were managed in line with PP O'Connor method statements.



RE-4 – SITE CLEARANCE OPERATIONS

OVERVIEW OF WORKS

Provision of welfare, offices and site security were set up as per the requirements of the contract documents. No buildings were present on-site prior to the remediation works; areas of hardstanding were present which involved their removal with subsequent segregation for later processing. Materials that were deemed to be unsuitable for use within the works or cannot be recycled after site processing, the residual materials will require offsite disposal

RE-5 – DELINEATION, EXCAVATION AND TREATMENT OF IDENTIFIED ASBESTOS IMPACT

CHEMICAL TESTING

I2 Analytical Report No: 20-33044-1 – SW-MG 101 - 110

I2 Analytical Report No: 20-33014-1 – SW MG 111 - 119

I2 Analytical Report No: 20-36425-1 – SW MG 120 - 131

I2 Analytical Report No: 20-36862-1 – SW MG 131 - 134

OVERVIEW OF WORKS

Detectable asbestos fibres have been identified within a number of locations within the Made Ground strata during previous phases of site investigation. Due to the nature and age of the filled material, it was assumed that trace fibres are present throughout the MADE GROUND. The remediation and enabling works were completed in a manner as to conform to the E3P Developed Conceptual Site Model which demonstrates a suitable method for management of soils to negate any future risk.

During the remediation works site won Made Ground was utilised for the general upfill works following a process of turnover with the removal of oversize materials. Both CAT A and CAT B trained personal completed a watching brief during the turnover works to identify any visible fragments of asbestos.

A total of 33 No samples were collected of the Made Ground soils which were re-used to upfill levels following processing. As part of the chemical analysis, all samples were submitted for an asbestos ID screen, additionally, positive samples underwent quantification analysis to further understand their risk. Out of the 33, No samples analysed positive samples were identified within 3 samples (SW- MG 109, 110 and 125) quantification analysis confirmed the presence of both chrysotile and amosite loose fibres at <0.001%. Soils were placed at depth in line asbestos risk mitigation conceptual site model below, which has been followed during the placement of material shown to contain asbestos fibres.



Asbestos in Soils Conceptual Site Model - Residential Apartment Development

Notes:

N.D. – None Detected

0.001% - Soils may contain 0.001% asbestos using composite testing to ensure there is no potential risk to human health. This value is present within areas where there may be short term low level exposure of soils containing trace asbestos fibres by construction workers where an appropriate level of asbestos management is employed (dust suppression).



During the works, Reassurance air testing was undertaken to demonstrate no airborne fibre release. Asbestos air tests are available upon request from the contractor.

RE-6 – EXCAVATION, BREAKING AND PROCESSING OF ALL ABOVE AND BELOW GROUND STRUCTURES

PHOTOGRAPHS

Plate 2 - 4

CHEMICAL TESTING

NA

OVERVIEW OF WORKS

No buildings were present on-site prior to the remediation works, however concrete slabs and asphalt hardstanding were present beneath a layer of shallow Made Ground. A number of historic brick footings were identified during the turnover works. As part of the enabling works, PP O'Connor removed obstruction to a depth of 2m below FFL. Formation level excavation levels are present within PP O'Connor drawings PPOC-ASB-0357-FORMATION RESI1-002 and PPOC-ASB-0357-FORMATION RESI2-007 present within appendix III.

Due to the small footprint area of the development and limited amount of hardstanding surfaces, all oversize material was removed from the site for off-site crushing to a licenced waste facility. All hardcore crush material was imported into the site to create the working platform.

Throughout the enabling works scrap metal and general waste was separated from demolition materials and placed into allocated skips for subsequent disposal off-site.



RE-7 – PROCESSING AND TURNOVER OF MADE GROUND SOILS

PHOTOGRAPHS

Plate 5 – 6

CHEMICAL TESTING

I2 Analytical Report No: 20-33044-1 – SW-MG 101 – 110 – Solid Analysis
I2 Analytical Report No: 20-33014-1 – SW MG 111 – 119 – Solid Analysis
I2 Analytical Report No: 20-36425-1 – SW MG 120 – 131 – Solid Analysis
I2 Analytical Report No: 20-36862-1 – SW MG 131 – 134 – Solid Analysis
I2 Analytical Report No: 20-39814-1 – SW MG 135 – 140 – Leachate analysis

GEOTECHNICAL TESTING

PSL Lab Report - PSL5386
I2 Lab Report - 20-31429

OVERVIEW OF WORKS

Chemical Screening Criteria

The results of the associated chemical analysis (one sample per 200m³) were compared to a bespoke site-specific threshold set defined within the E3P Remediation Implementation Plan. A total of 33 No samples were gathered from Made Ground soils for re-use within Plots 1 and 2. Chemical analysis identified several non-volatile PAHs and Heavy metal concentrations which exceeded the human health remediation target values. The main exposure pathway for this determinant is dermal contact and ingestion, therefore this pathway will be broken as the material will be placed below hardstanding and will therefore not pose a risk to future end users. Furthermore, asbestos in the form of chrysotile and amosite loose fibres at <0.001% have been identified within 3 No samples, due to the placement at depth under hardstanding these ACMs are not considered to pose a risk to human health. It should be noted that if Made Ground soils are to be excavated consideration should be given to ACM impacted soils and risk to construction workers.

A number of volatile exceedances associated with Naphthalene (2.5 mg/kg – 43 mg/kg) and mercury (1.2mg/kg – 2.5mg/kg) concentrations have been identified throughout the site won Made Ground soils. The pollutant pathway associated with naphthalene is volatilisation into indoor airspace and therefore, in this instance a hydrocarbon resistant membrane should be considered within the proposed residential high-rise apartments in order to break the pollutant pathway. In the case of the mercury exceedances, these are only considered to be minor elevations, additionally, only total mercury has been analysed within the analysis which is a total of organic, elemental and Methyl mercury whereby elemental mercury is only considered to be a volatile contaminant. An appropriate VOC/ Hydrocarbon membrane should be constructed within the proposed development.

Leachate testing on bulk fill samples recorded elevated levels of heavy metals however, the proposed development site will be covered in hardstanding and buildings which will minimise infiltration and the generation of leachate. There are currently no groundwater abstractions within the vicinity of the site. Previous investigations identified that surface waters in the River Irk do not appear to have been impacted by discharge of groundwater from the site.

Geotechnical Testing



Fill material beneath proposed buildings were required to conform to Class 1A to be upfilled from 2.5m following removal of obstructions. Particle Size Distribution Tests (PSD) and Proctor Tests utilising 4.5kg rammer were performed on the Made Ground general fill upfill materials won from the processed Made Ground. 8 No Particle size distribution tests confirmed material conformed to Class 1A in line with SHW series 600 table 6/2. It should be noted that 2 no sample SW-MG 111 and 112 were classed as 2C which were removed from the site. Class 1A material was placed in 225mm layers and compacted utilising 4 passes of >5000kg vibrating roller. Max Dry Density / optimum moisture content testing utilising a 4,5kg rammer were subjected to materials that returned as Class 1A. Sample ref SW-MG-105 returned as wet of the optimum (see appendix VI). The associated material was given time to dry during a period of more climatically favourable weather. Non-Nuclear Density Gauge testing confirmed compaction in excess of 95% of the lab defined optimum.

Onsite discussions with the client and O'Connor confirmed that shearbox testing would not be required within the upfill, additionally CBRs would also not be required and therefore were not undertaken during the general fill upfill works.

RE-8 – IMPORTATION OF BULK FILL

PHOTOGRAPHS

Plate 7 - 8

CHEMICAL TESTING

I2 Analytical Report No: 20-36435-1

GEOTECHNICAL TESTING

PSL Lab Report - PSL5773

PSL Lab Report - PSL5750

Terra Tek Report C7237

OVERVIEW OF WORKS

Chemical Screening Criteria

6 No samples of imported natural quarried aggregate were tested in line with the testing requirements defined within the remediation implementation plan. Chemical testing confirmed the material was suitable for re-use with no identified exceedances.

Geotechnical Testing

Fill materials were required to be placed below ground bearing slabs to be class 6F2 or 6F5 and to be natural quarried aggregate within 300mm thick pile mat. 9 No Particle Size Distribution Tests (PSD) were undertaken on the imported material which confirmed the material confirmed to 6F2 grading in line with SHW series 600 table 6/2.

Max deformation and CBR by plate load (600mm plate) were undertaken across both working platforms at the frequencies defined within the E3P Geotechnical performance specification. CBR results are present within appendix IV, all results were submitted to the client and their design team for approval prior to sign off on each working platform at the time of the works. Additionally, Large shear box testing was completed and issued to the client design team to assist with the working platform designs for the crane and piling rigs. It should be noted that due to failures in the CBR testing mat thickness was increased with the inclusion of a geogrid to achieve favourable settlement and CBR values.



RE-9 – INDEPENDENT VALIDATION: WATCHING BRIEF

OVERVIEW OF WORKS

E3P conducted a part-time site-wide independent watching brief across the site due to the possibility of previously unidentified contamination hotspots being present on-site, along with the need to record and document site works for independent validation purposes.

RE-10 – WASTE SOILS SURPLUS TO REQUIREMENTS

OVERVIEW OF WORKS

Material that were deemed either chemically or geotechnically unsuitable were removed from the site to a registered waste facility. Waste transfer notes are available from the contractor upon request.

5. CONCLUSION

The remediation elements identified within the approved Remediation and Enabling Works Strategy have been completed with validation testing confirming that the works have been completed to the required standard.

As part of the on-going construction works the developer will be required to construct and validate the items within the Arup VIC-ARUP-ZZ-XX-SP-CG-0001 | P1 dated February 2018 report in accordance with the requirements of the regulatory authorities as documented in detail within this report.

END OF REPORT



APPENDIX I

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the Client as indicated in Section 1.2.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
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10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



APPENDIX II

GLOSSARY

TERMS

ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
CA	Coal Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation
MCV	Moisture condition value	WRAP	Waste and Resources Action Programme
MIBK	Methyl isobutyl ketone	WTE	Water table elevation



New Victoria, Manchester

Remediation and Enabling Works Validation

November 2021

m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection

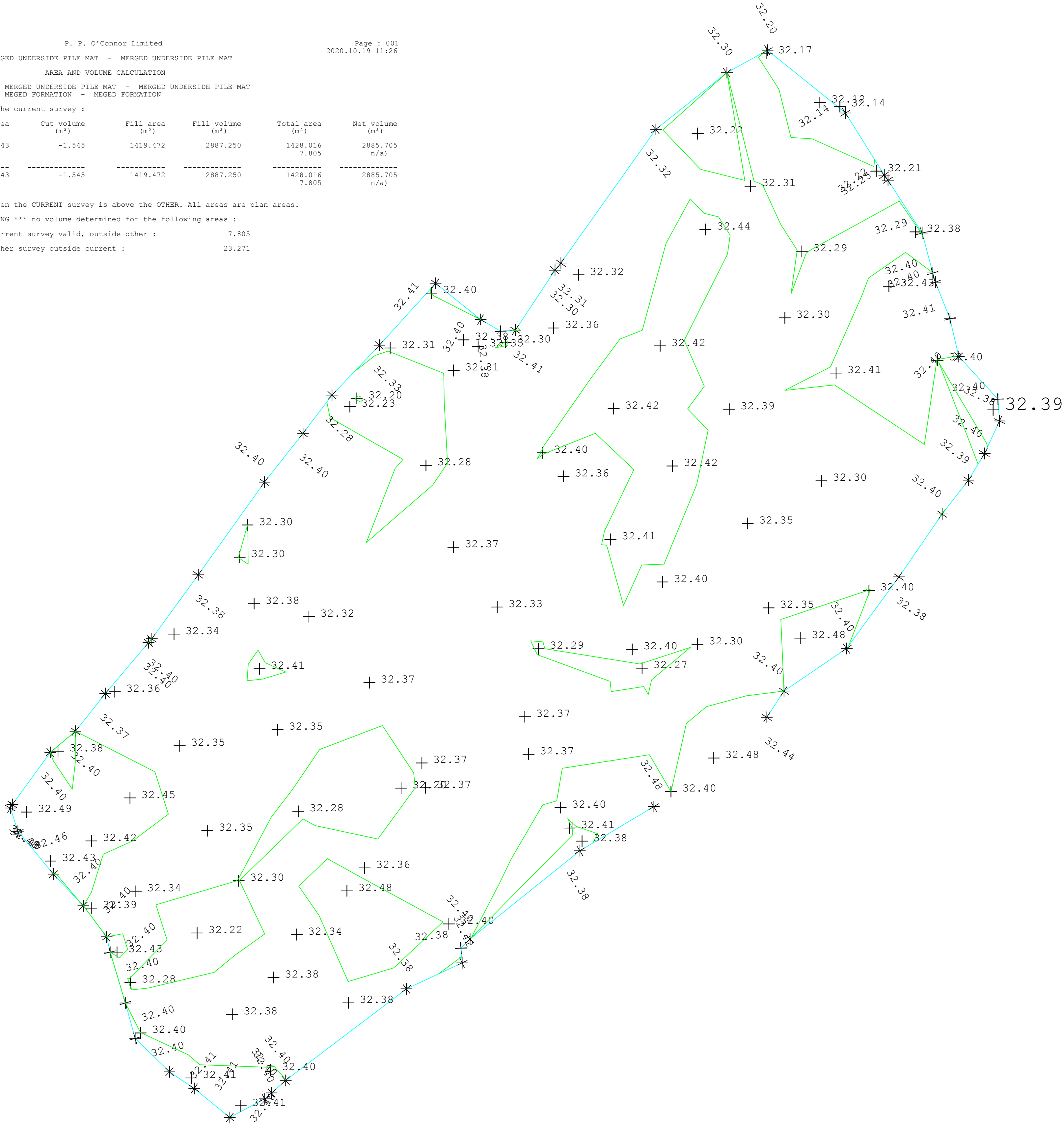


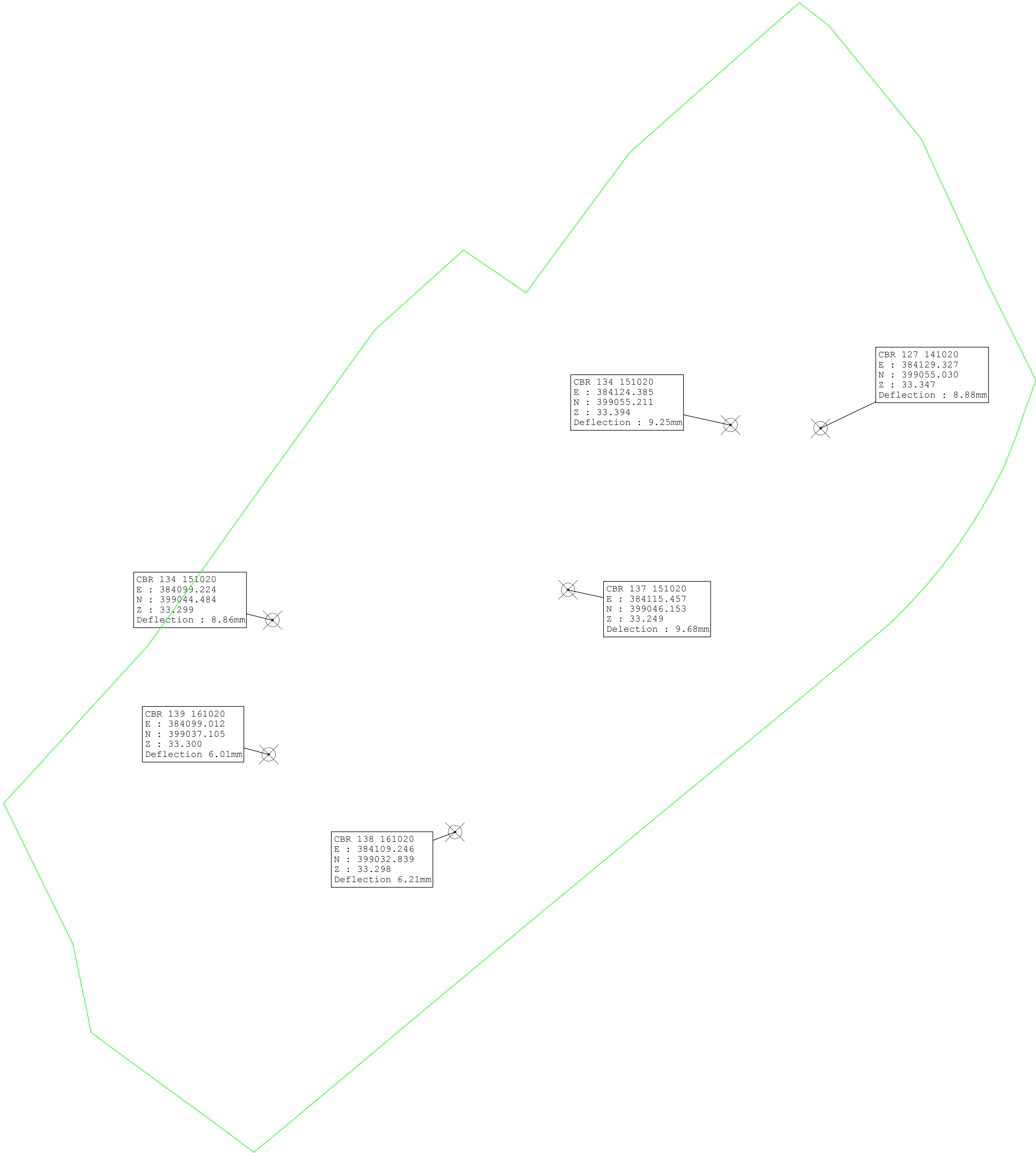
APPENDIX III

DRAWINGS



McCarthy Taylor Systems Ltd. LSS v10.01.16 / 1629.02		P. P. O'Connor Limited MERGED UNDERSIDE FILE MAT - MERGED UNDERSIDE FILE MAT				Page : 001 2020.10.19 11:26	
AREA AND VOLUME CALCULATION							
Volume between current survey : MERGED UNDERSIDE FILE MAT - MERGED UNDERSIDE FILE MAT and other survey : MEGED FORMATION - MEGED FORMATION							
Volumes by surface feature in the current survey :							
Surface	Description	Cut area (m ²)	Cut volume (m ³)	Fill area (m ²)	Fill volume (m ³)	Total area (m ²)	Net volume (m ³)
None	(Undetermined :	8.543	-1.545	1419.472	2887.250	1428.016 7.805	2885.705 n/a)
Grand total :	(Undetermined :	8.543	-1.545	1419.472	2887.250	1428.016 7.805	2885.705 n/a)
Note : "FILL" when the CURRENT survey is above the OTHER. All areas are plan areas.							
*** WARNING *** no volume determined for the following areas :							
Current survey valid, outside other :					7.805		
Other survey outside current :					23.271		





Notes	
1. All dimensions are in metres unless otherwise stated.	
2. Do not scale from this drawing, any dimensions should be confirmed with the designers.	
3. All levels shown are in metres above Ordnance Datum.	
4. Levels Survey undertaken by PP O`Connor Ltd	

Key to symbols	

Reference drawings	

AB			As Built Issue		
Rev	Date	Drawn	Description	Ch/k'd	App'd

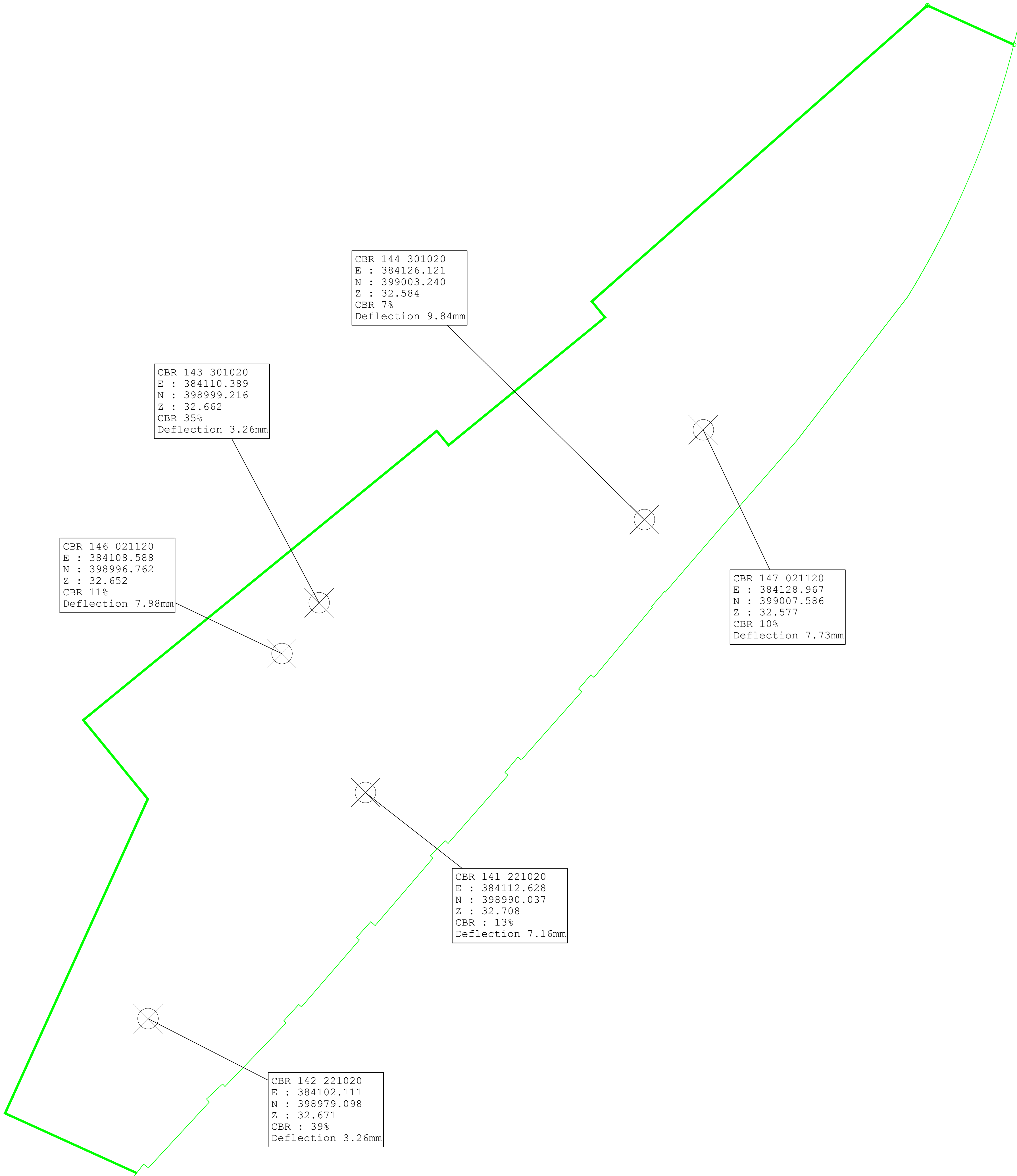


61 Moseley Road
Trafford Park
Manchester
M17 1GJ



Title
New Victoria
RES1 1 Top of Pilemat
CBR Test Locations

Designed			Eng.Chk.		
Drawn	Craig Hindle	CH	Coordination		
Dwg.Chk.	Paul Heaton	PH	Approved	Stewart Lucas	SL
Scale at A1		Project	C0357		Status
		CAD file	C0357/001		ASB
Drawing No PPOC-ASB-0357-001					Rev



PP O`Connor Construction Limited

This document should not be relied on or used in circumstances other than those for which it was originally prepared and for which PP O`Connor Construction Ltd was commissioned. PP O`Connor Construction Ltd accepts no responsibility for this document to any other party other than the person by whom it was commissioned.

Notes

1. All dimensions are in metres unless otherwise stated.
2. Do not scale from this drawing, any dimensions should be confirmed with the designers.
3. All levels shown are in metres above Ordnance Datum.
4. Levels Survey undertaken by PP O`Connor Ltd

Key to symbols

Reference drawings

AB			As Built Issue		
Rev	Date	Drawn	Description	Ch/k'd	App'd



61 Moseley Road
Trafford Park
Manchester
M17 1GJ

Client



Title

New Victoria
RESI 2 Top of Pilemat
CBR Test Locations

Designed			Eng.Chk.		
Drawn	Craig Hindle	CH	Coordination		
Dwg.Chk.	Paul Heaton	PH	Approved	Stewart Lucas	SL
Scale at A1		Project	C0357		Status
		CAD file	C0357/006		ASB
Drawing No PPOC-ASB-0357-006					Rev



McCarthy Taylor Systems Ltd.
LSS v10.01.16 / 1629.02

P. P. O'Connor Limited
201009 TOP PILING MAT - 201009 TOP PILING MAT

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2020.10.30 11:54

AREA AND VOLUME CALCULATION

Volume between current survey : 201009 TOP PILING MAT - 201009 TOP PILING MAT
and other survey : MERGED UNDERSIDE PILE MAT - MERGED UNDERSIDE PILE MAT

Volumes by surface feature in the current survey :

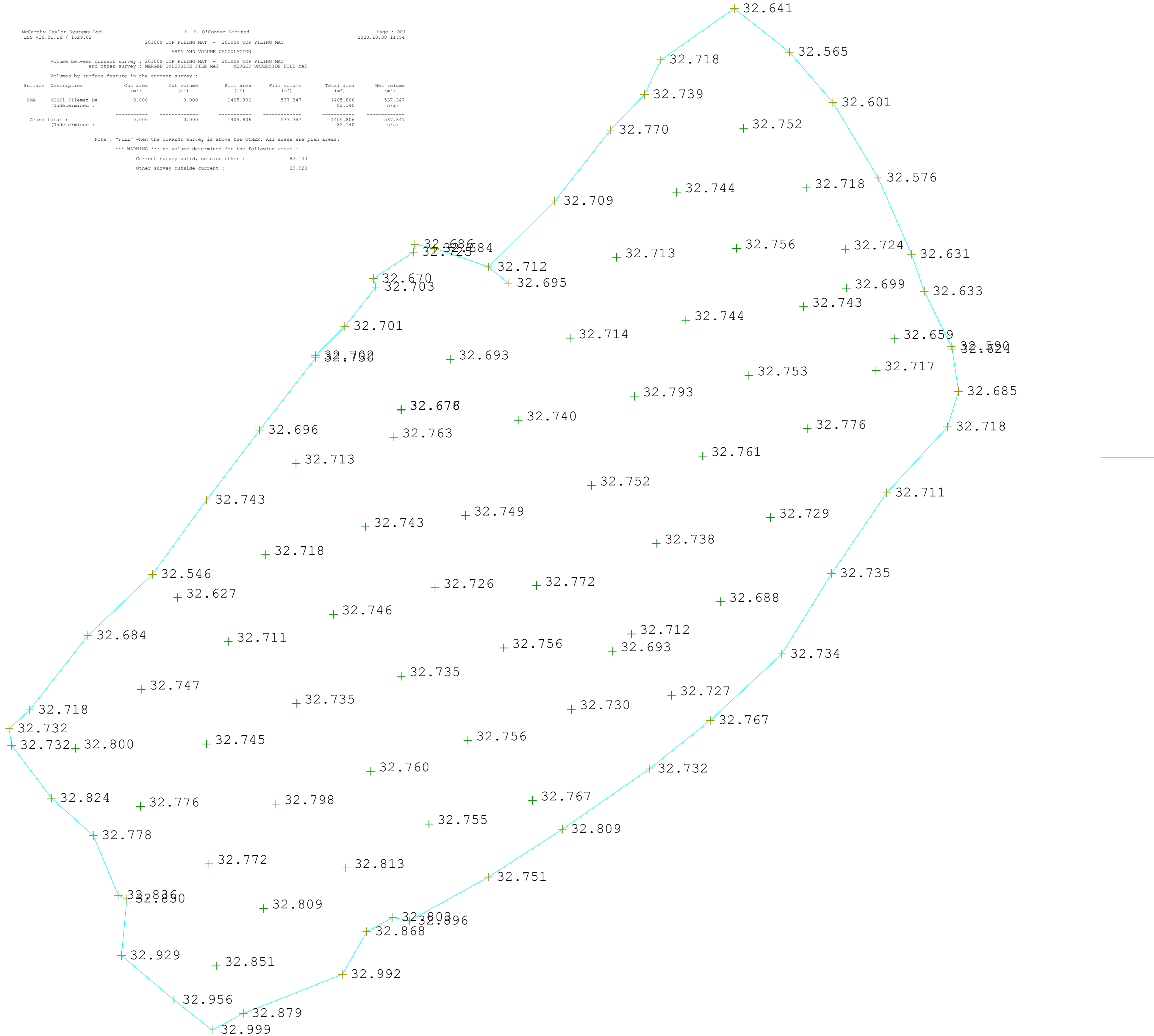
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PMA	RES11 Pilemat De (Undetermined :	0.000	0.000	1405.806	537.347	1405.806	537.347
						82.140	n/a)
Grand total :		0.000	0.000	1405.806	537.347	1405.806	537.347
(Undetermined :						82.140	n/a)

Note : "FILL" when the CURRENT survey is above the OTHER. All areas are plan areas.

*** WARNING *** no volume determined for the following areas :

Current survey valid, outside other : 82.140

Other survey outside current : 29.920



- Notes
1. All dimensions are in metres unless otherwise stated.
 2. Do not scale from this drawing, any dimensions should be confirmed with the designers.
 3. All levels shown are in metres above Ordnance Datum.
 4. Levels Survey undertaken by PP O` Connor Ltd

Key to symbols

Reference drawings

AB			As Built Issue		
Rev	Date	Drawn	Description	Ch'k'd	App'd



61 Moseley Road
Trafford Park
Manchester
M17 1GJ



Title

New Victoria
RES1 1 Design Pilemat Levels

Designed			Eng.Chk.		
Drawn	Craig Hindle	CH	Coordination		
Dwg.Chk.	Paul Heaton	PH	Approved	Stewart Lucas	SL
Scale at A1		Project	C0357		Status
		CAD file	C0357/004		ASB
Drawing No					Rev
PPOC-ASB-0357-004					



Additional Piling Mat Thickness
Type : Quarried 6F5
6F5 Plan area : 893.719m²
3 layers of Geogrid
Fill volume : 481.200m³



Additional Piling Mat Thickness
Type : Recycled 6F5
Plan area : 618.841m²
1 Layer of Geogrid above original design
Fill volume : 331.550m³

- Notes
1. All dimensions are in metres unless otherwise stated.
 2. Do not scale from this drawing, any dimensions should be confirmed with the designers.
 3. All levels shown are in metres above Ordnance Datum.
 4. Levels Survey undertaken by PP O' Connor Ltd

Key to symbols

Reference drawings

AB			As Built Issue		
Rev	Date	Drawn	Description	Ch'k'd	App'd

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61 Moseley Road
Trafford Park
Manchester
M17 1GJ



Title
New Victoria
RES1 Finished Pilemat Levels
Additional Depth and Volumes

Designed			Eng.Chk.		
Drawn	Craig Hindle	CH	Coordination		
Dwg.Chk.	Paul Heaton	PH	Approved	Stewart Lucas	SL
Scale at A1		Project	C0357		Status
		CAD file	C0357/005		ASB
Drawing No PPOC-ASB-0357-005					Rev



McCarthy Taylor Systems Ltd.
LSS v10.01.16 / 1629.02

P. P. O'Connor Limited
MEGED FORMATION - MEGED FORMATION
AREA AND VOLUME CALCULATION

Page : 001
2020.10.19 11:08

Volume between current survey : MEGED FORMATION - MEGED FORMATION
and other survey : SEP OGL 3D CAD - SEP OGL 3D CAD

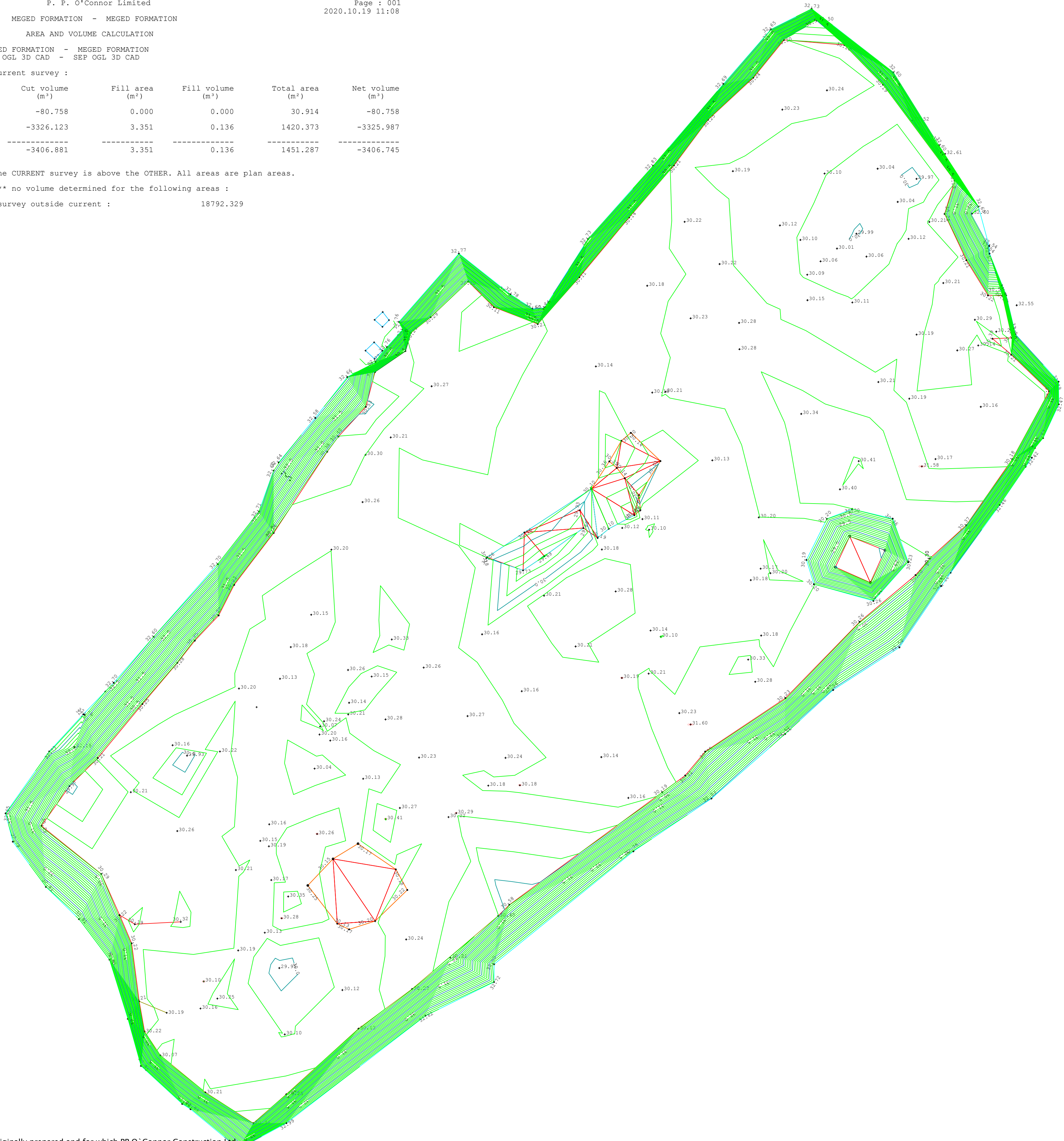
Volumes by surface feature in the current survey :

Surface	Description	Cut area (m²)	Cut volume (m³)	Fill area (m²)	Fill volume (m³)	Total area (m²)	Net volume (m³)
BRK	Brick	30.914	-80.758	0.000	0.000	30.914	-80.758
None		1417.022	-3326.123	3.351	0.136	1420.373	-3325.987
Grand total :		1447.936	-3406.881	3.351	0.136	1451.287	-3406.745

Note : "FILL" when the CURRENT survey is above the OTHER. All areas are plan areas.

*** WARNING *** no volume determined for the following areas :

Other survey outside current : 18792.329



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4. Levels Survey undertaken by PP O'Connor Ltd

Key to symbols

Reference drawings

AB			As Built Issue		
Rev	Date	Drawn	Description	Ch'k'd	App'd

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Manchester
M17 1GJ

Client



Title
New Victoria
RES1 1 Excavated Formation

Designed			Eng.Chk.		
Drawn	Craig Hindle	CH	Coordination		
Dwg.Chk.	Paul Heaton	PH	Approved	Stewart Lucas	SL
Scale at A1		Project	C0357		Status
		CAD file	C0357/002		ASB
Drawing No PPOC-ASB-0357-002					Rev



McCarthy Taylor Systems Ltd.
LSS v10.01.16 / 1629.02

P. P. O'Connor Limited
MEGED RESI 2 FORMATION - 201020 RESI2 FORMATION

Page : 001
2020.11.03 13:20

AREA AND VOLUME CALCULATION

Volume between current survey : MEGED RESI 2 FORMATION - 201020 RESI2 FORMATION
and other survey : SEP OGL TRIANGLES - SEP OGL TRIANGLES

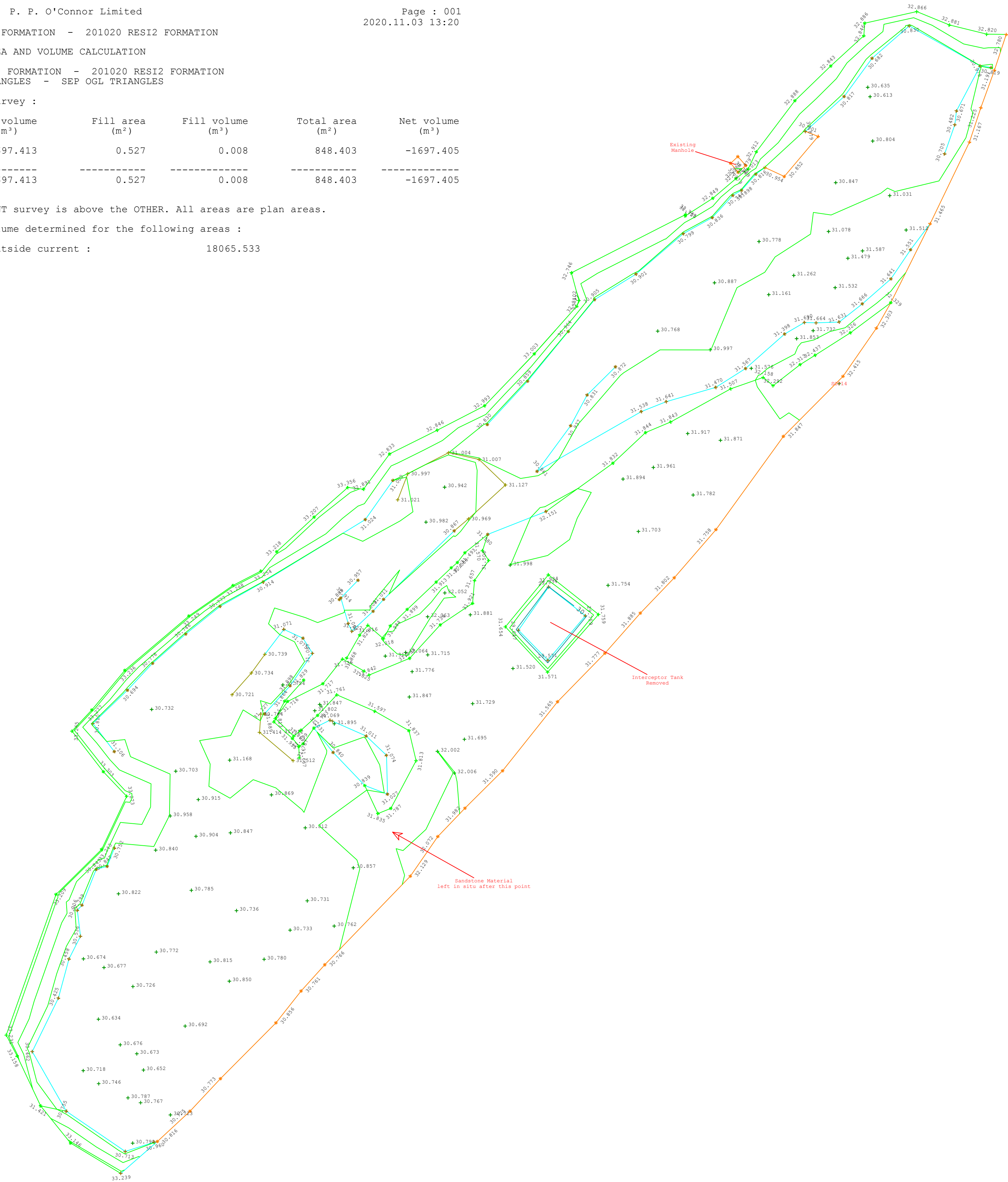
Volumes by surface feature in the current survey :

Surface Description	Cut area (m ²)	Cut volume (m ³)	Fill area (m ²)	Fill volume (m ³)	Total area (m ²)	Net volume (m ³)
None	847.876	-1697.413	0.527	0.008	848.403	-1697.405
Grand total :	847.876	-1697.413	0.527	0.008	848.403	-1697.405

Note : "FILL" when the CURRENT survey is above the OTHER. All areas are plan areas.

*** WARNING *** no volume determined for the following areas :

Other survey outside current : 18065.533



Notes

1. All dimensions are in metres unless otherwise stated.
2. Do not scale from this drawing, any dimensions should be confirmed with the designers.
3. All levels shown are in metres above Ordnance Datum.
4. Levels Survey undertaken by PP O`Connor Ltd

Key to symbols

Reference drawings

AB			As Built Issue		
Rev	Date	Drawn	Description	Ch'k'd	App'd

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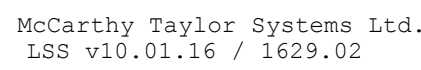
61 Moseley Road
Trafford Park
Manchester
M17 1GJ

Client



Title
New Victoria
RESI 2 Excavated Formation

Designed			Eng.Chk.		
Drawn	Craig Hindle	CH	Coordination		
Dwg.Chk.	Paul Heaton	PH	Approved	Stewart Lucas	SL
Scale at A1		Project	C0357	Status	
		CAD file	C0357/007	ASB	
Drawing No		PPOC-ASB-0357-007			Rev



P. P. O'Connor Limited

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2020.11.03 13:21

MEGED RESI 2 FORMATION - 201020 RESI2 FORMATION

AREA AND VOLUME CALCULATION

Volume between current survey : MEGED RESI 2 FORMATION - 201020 RESI2 FORMATION
and other survey : 201103 RESI 2 PILEMAT COMPLETE - 201103 RESI 2 PILEMAT COMPLETE

Volumes by surface feature in the current survey :

Surface	Description	Cut area (m ²)	Cut volume (m ³)	Fill area (m ²)	Fill volume (m ³)	Total area (m ²)	Net volume (m ³)
None	(Undetermined :	0.340	-0.023	808.705	1232.688	809.045 39.358	1232.666 n/a)
		-----	-----	-----	-----	-----	-----
Grand total :	(Undetermined :	0.340	-0.023	808.705	1232.688	809.045 39.358	1232.666 n/a)

Note : "FILL" when the OTHER survey is above the CURRENT. All areas are plan areas.

*** WARNING *** no volume determined for the following areas :

Current survey valid, outside other : 39.358

Other survey outside current :	14.501
--------------------------------	--------



Class 1A Fill : 172.103 cu m

Class 6F5 : 1060.585 cu m

Notes

1. All dimensions are in metres unless otherwise stated.
2. Do not scale from this drawing, any dimensions should be confirmed with the designers.
3. All levels shown are in metres above Ordnance Datum.
4. Levels Survey undertaken by PP O`Connor Ltd

Key to symbols

Reference drawings

AB			As Built Issue		
Rev	Date	Drawn	Description	Ch'k'd	App'd

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61 Moseley Road
Trafford Park
Manchester
M17 1GJ

Client



Title
New Victoria
RESI 2 Top of Pilemat

Designed			Eng.Chk.		
Drawn	Craig Hindle	CH	Coordination		
Dwg.Chk.	Paul Heaton	PH	Approved	Stewart Lucas	SL
Scale at A1		Project	C0357	Status ASB	
		CAD file	C0357/008		
Drawing No PPOC-ASB-0357-008					Rev

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APPENDIX IV CHEMICAL TESTING RESULTS



4041



Environmental Science

Andrew Allcocke3p
Heliport Business Centre
Manchester
M30 7RUi2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS**t:** 01923 225404**f:** 01923 237404**e:** reception@i2analytical.com**e:** aallcock@e3p.co.uk

Analytical Report Number : 20-33014

Project / Site name:	New Victoria	Samples received on:	30/09/2020
Your job number:	14-284	Samples instructed on/ Analysis started on:	30/09/2020
Your order number:	14284-AA-E	Analysis completed by:	09/10/2020
Report Issue Number:	1	Report issued on:	09/10/2020
Samples Analysed:	9 soil samples		

Signed:Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 20-33014

Project / Site name: New Victoria

Your Order No: 14284-AA-E

Lab Sample Number	1635900	1635901	1635902	1635903
Sample Reference	SW-MG 111	SW-MG 112	SW-MG 113	SW-MG 114
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	30/09/2020	30/09/2020	30/09/2020	30/09/2020
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	9.5	12	9.9	8.6
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3	0.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.2	9.4	8.4	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	2	2
Total Sulphate as SO ₄	mg/kg	50	MCERTS	2900	1900	1400	1600
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.52	0.23	0.12	0.2
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	1000	450	240	400
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	522	226	121	202
Sulphide	mg/kg	1	MCERTS	1.4	76	< 1.0	3.6
Total Sulphur	mg/kg	50	MCERTS	1400	880	670	710

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	5.1	8	6.2	3.5
Acenaphthylene	mg/kg	0.05	MCERTS	1.2	1.3	1.9	1.4
Acenaphthene	mg/kg	0.05	MCERTS	2.6	5.4	1.9	1.9
Fluorene	mg/kg	0.05	MCERTS	3.8	5.7	3.3	3
Phenanthrene	mg/kg	0.05	MCERTS	24	39	23	24
Anthracene	mg/kg	0.05	MCERTS	5	8.4	4.9	4.9
Fluoranthene	mg/kg	0.05	MCERTS	24	33	23	24
Pyrene	mg/kg	0.05	MCERTS	24	34	23	25
Benzo(a)anthracene	mg/kg	0.05	MCERTS	12	17	12	13
Chrysene	mg/kg	0.05	MCERTS	10	16	10	11
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	11	17	12	12
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	4.5	6.2	5	5.7
Benzo(a)pyrene	mg/kg	0.05	MCERTS	10	14	11	11
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.5	6.2	4.9	4.6
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.5	2	1.5	1.6
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.4	7.3	5.8	5.6

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	148	220	148	152
-----------------------------	-------	-----	--------	-----	-----	-----	-----

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	25	27	27
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	< 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	25	33	29	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	130	140	130	140
Lead (aqua regia extractable)	mg/kg	1	MCERTS	460	610	470	620
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.8	1	1.2	1.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	32	25	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	210	170	190



Analytical Report Number: 20-33014

Project / Site name: New Victoria

Your Order No: 14284-AA-E

Lab Sample Number	1635900	1635901	1635902	1635903
Sample Reference	SW-MG 111	SW-MG 112	SW-MG 113	SW-MG 114
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	30/09/2020	30/09/2020	30/09/2020	30/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accred- itation Status	

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	25	23	17	17
TPH (C12 - C16)	mg/kg	4	MCERTS	56	34	30	30
TPH (C16 - C21)	mg/kg	1	MCERTS	160	120	86	91
TPH (C21 - C35)	mg/kg	1	MCERTS	440	230	150	180
TPH (C35 - C40)	mg/kg	10	MCERTS	100	63	22	15
TPH Total C5 - C40	mg/kg	10	MCERTS	810	500	330	360

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-33014
Project / Site name: New Victoria
Your Order No: 14284-AA-E

Lab Sample Number	1635904	1635905	1635906	1635907
Sample Reference	SW-MG 115	SW-MG 116	SW-MG 117	SW-MG 118
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	30/09/2020	30/09/2020	30/09/2020	30/09/2020
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	13	9	7	5.5
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3	0.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8.2	8.8	8.4
Total Cyanide	mg/kg	1	MCERTS	1	2	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1400	2000	6200	2100
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.11	0.25	1.9	0.32
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	220	500	3800	640
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	108	252	1910	318
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	17	19
Total Sulphur	mg/kg	50	MCERTS	720	950	2400	1000

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	11	3.7	1.5	2.5
Acenaphthylene	mg/kg	0.05	MCERTS	4.9	1.4	0.79	1.2
Acenaphthene	mg/kg	0.05	MCERTS	7.2	2.7	4.8	4.3
Fluorene	mg/kg	0.05	MCERTS	12	3.7	3.6	3.8
Phenanthrene	mg/kg	0.05	MCERTS	89	25	26	35
Anthracene	mg/kg	0.05	MCERTS	19	5.5	5.1	9.6
Fluoranthene	mg/kg	0.05	MCERTS	81	29	24	50
Pyrene	mg/kg	0.05	MCERTS	89	30	23	49
Benzo(a)anthracene	mg/kg	0.05	MCERTS	42	15	13	27
Chrysene	mg/kg	0.05	MCERTS	35	13	9.9	22
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	44	15	13	31
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	9.5	6.7	2	5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	34	14	8.8	20
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	15	6.7	4.1	8.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	4.2	1.9	1.4	3.2
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	18	8	5.1	10

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	516	182	148	283
-----------------------------	-------	-----	--------	-----	-----	-----	-----

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	29	21	15	20
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.5	0.7
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	27	28	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	140	120	70	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	490	630	340	550
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.3	1.2	0.8	0.8
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	31	28	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	170	170	130	180



Analytical Report Number: 20-33014
 Project / Site name: New Victoria
 Your Order No: 14284-AA-E

Lab Sample Number	1635904	1635905	1635906	1635907
Sample Reference	SW-MG 115	SW-MG 116	SW-MG 117	SW-MG 118
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	30/09/2020	30/09/2020	30/09/2020	30/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	31	24	18	25
TPH (C12 - C16)	mg/kg	4	MCERTS	53	42	39	82
TPH (C16 - C21)	mg/kg	1	MCERTS	160	130	98	350
TPH (C21 - C35)	mg/kg	1	MCERTS	260	270	240	630
TPH (C35 - C40)	mg/kg	10	MCERTS	41	16	49	87
TPH Total C5 - C40	mg/kg	10	MCERTS	580	510	470	1200

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-33014

Project / Site name: New Victoria

Your Order No: 14284-AA-E

Lab Sample Number				1635908	
Sample Reference				SW-MG 119	
Sample Number				None Supplied	
Depth (m)				None Supplied	
Date Sampled				30/09/2020	
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	7.2
Total mass of sample received	kg	0.001	NONE	0.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1
Total Sulphate as SO4	mg/kg	50	MCERTS	5300
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	2
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	4000
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	1990
Sulphide	mg/kg	1	MCERTS	27
Total Sulphur	mg/kg	50	MCERTS	2100

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
----------------------------	-------	---	--------	-------

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	3.6
Acenaphthylene	mg/kg	0.05	MCERTS	0.51
Acenaphthene	mg/kg	0.05	MCERTS	5
Fluorene	mg/kg	0.05	MCERTS	4.2
Phenanthrene	mg/kg	0.05	MCERTS	36
Anthracene	mg/kg	0.05	MCERTS	8.6
Fluoranthene	mg/kg	0.05	MCERTS	43
Pyrene	mg/kg	0.05	MCERTS	41
Benzo(a)anthracene	mg/kg	0.05	MCERTS	23
Chrysene	mg/kg	0.05	MCERTS	20
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	23
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	7.5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	17
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	8.1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.7
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	9.4

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	254
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5
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	78
Lead (aqua regia extractable)	mg/kg	1	MCERTS	430
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130



Analytical Report Number: 20-33014
 Project / Site name: New Victoria
 Your Order No: 14284-AA-E

Lab Sample Number				1635908
Sample Reference				SW-MG 119
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				30/09/2020
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	28
TPH (C12 - C16)	mg/kg	4	MCERTS	110
TPH (C16 - C21)	mg/kg	1	MCERTS	480
TPH (C21 - C35)	mg/kg	1	MCERTS	510
TPH (C35 - C40)	mg/kg	10	MCERTS	130
TPH Total C5 - C40	mg/kg	10	MCERTS	1300

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 20-33014
Project / Site name: New Victoria

* 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 *
1635900	SW-MG 111	None Supplied	None Supplied	Brown loam and clay with gravel.
1635901	SW-MG 112	None Supplied	None Supplied	Brown loam and clay with gravel.
1635902	SW-MG 113	None Supplied	None Supplied	Brown loam and clay with gravel.
1635903	SW-MG 114	None Supplied	None Supplied	Brown loam and clay with gravel.
1635904	SW-MG 115	None Supplied	None Supplied	Brown loam and clay with gravel.
1635905	SW-MG 116	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
1635906	SW-MG 117	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
1635907	SW-MG 118	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
1635908	SW-MG 119	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.



Analytical Report Number : 20-33014
Project / Site name: New Victoria

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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.	L038-PL	D	MCERTS
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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
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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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 sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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
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.	L038-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
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	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
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS



Analytical Report Number : 20-33014
Project / Site name: New Victoria

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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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 : 20-33044

Project / Site name:	New Victoria	Samples received on:	23/09/2020
Your job number:	14-284	Samples instructed on/ Analysis started on:	30/09/2020
Your order number:	14284-AA-B	Analysis completed by:	07/10/2020
Report Issue Number:	1	Report issued on:	07/10/2020
Samples Analysed:	10 soil samples		


Signed:

Rachel Bradley
Deputy 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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 20-33044
Project / Site name: New Victoria
Your Order No: 14284-AA-B

Lab Sample Number	1636105	1636106	1636107	1636108
Sample Reference	SW-MG-101	SW-MG-102	SW-MG-103	SW-MG-104
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Station Status	Accreditation

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	10	7.4	6.3	12
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3	0.3

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
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	8.4	8.4	8.5
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	3100	1600	1400	1700
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	940	430	320	570
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.47	0.21	0.16	0.29
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	470	215	160	288
Sulphide	mg/kg	1	MCERTS	46	34	29	2.7
Total Sulphur	mg/kg	50	MCERTS	1500	870	990	1000

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	3.2	2.4	2	43
Acenaphthylene	mg/kg	0.05	MCERTS	0.22	1.1	0.37	2.3
Acenaphthene	mg/kg	0.05	MCERTS	3	2	1	15
Fluorene	mg/kg	0.05	MCERTS	2.5	2.8	1.2	15
Phenanthrene	mg/kg	0.05	MCERTS	20	23	9.2	84
Anthracene	mg/kg	0.05	MCERTS	4.5	4.8	2	17
Fluoranthene	mg/kg	0.05	MCERTS	19	26	9.4	61
Pyrene	mg/kg	0.05	MCERTS	18	26	9.8	61
Benzo(a)anthracene	mg/kg	0.05	MCERTS	9.2	13	4.8	28
Chrysene	mg/kg	0.05	MCERTS	8.2	12	4.7	29
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	9.8	15	5.6	27
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.1	3.4	1.4	12
Benzo(a)pyrene	mg/kg	0.05	MCERTS	7.6	11	4.1	24
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	3.9	5.3	2	10
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1	1.2	0.56	3.4
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.9	6.3	2.5	12

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	118	155	60.6	444
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Analytical Report Number: 20-33044
Project / Site name: New Victoria
Your Order No: 14284-AA-B

Lab Sample Number	1636105	1636106	1636107	1636108
Sample Reference	SW-MG-101	SW-MG-102	SW-MG-103	SW-MG-104
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accred- itation Status	Accred- itation Status

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	31	19	18	24
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.8
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	27	22	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	170	120	130	120
Lead (aqua regia extractable)	mg/kg	1	MCERTS	870	1000	530	690
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	1.2	1.3	1.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	35	30	28	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.2	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	170	170	150	750

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	24	19	14	110
TPH (C12 - C16)	mg/kg	4	MCERTS	36	60	51	140
TPH (C16 - C21)	mg/kg	1	MCERTS	120	220	100	440
TPH (C21 - C35)	mg/kg	1	MCERTS	260	570	310	700
TPH (C35 - C40)	mg/kg	10	MCERTS	43	160	90	120
TPH Total C5 - C40	mg/kg	10	MCERTS	500	1000	580	1600

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-33044
Project / Site name: New Victoria
Your Order No: 14284-AA-B

Lab Sample Number	1636109	1636110	1636111	1636112
Sample Reference	SW-MG-105	SW-MG-106	SW-MG-107	SW-MG-108
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Statu s	Accred itation

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	16	14	16
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3	0.3

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
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	8	8.1	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1	1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	2200	1500	1200	1600
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	510	450	190	180
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.25	0.22	0.094	0.092
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	254	224	93.7	91.5
Sulphide	mg/kg	1	MCERTS	3.6	15	25	33
Total Sulphur	mg/kg	50	MCERTS	1200	980	670	850

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	9.6	14	3.5	2.5
Acenaphthylene	mg/kg	0.05	MCERTS	1.5	4	1.5	1
Acenaphthene	mg/kg	0.05	MCERTS	5.4	7.7	4.5	1.3
Fluorene	mg/kg	0.05	MCERTS	6.3	12	5.2	2.6
Phenanthrene	mg/kg	0.05	MCERTS	43	75	34	16
Anthracene	mg/kg	0.05	MCERTS	9.2	16	7.2	3.6
Fluoranthene	mg/kg	0.05	MCERTS	41	67	35	17
Pyrene	mg/kg	0.05	MCERTS	42	69	36	18
Benzo(a)anthracene	mg/kg	0.05	MCERTS	20	32	17	8.8
Chrysene	mg/kg	0.05	MCERTS	19	32	17	7.8
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	19	37	19	9.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	9.3	8.6	5.2	2.2
Benzo(a)pyrene	mg/kg	0.05	MCERTS	18	29	15	7.6
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	8.1	12	6.8	3.3
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.7	3.9	1.9	1.1
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	9.8	14	8.1	4.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	264	433	217	106
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Analytical Report Number: 20-33044
Project / Site name: New Victoria
Your Order No: 14284-AA-B

Lab Sample Number	1636109	1636110	1636111	1636112
Sample Reference	SW-MG-105	SW-MG-106	SW-MG-107	SW-MG-108
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accred- itation Status	

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	32	26	30
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.9	< 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	35	30	26	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	150	160	300	130
Lead (aqua regia extractable)	mg/kg	1	MCERTS	700	790	630	660
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.9	1.7	0.9	0.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	39	32	34
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.2	< 1.0	1.6	1.4
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	470	580	220	200

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	10	30	15	17
TPH (C12 - C16)	mg/kg	4	MCERTS	18	67	34	26
TPH (C16 - C21)	mg/kg	1	MCERTS	130	250	140	95
TPH (C21 - C35)	mg/kg	1	MCERTS	250	420	290	210
TPH (C35 - C40)	mg/kg	10	MCERTS	44	61	61	38
TPH Total C5 - C40	mg/kg	10	MCERTS	460	850	560	410

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-33044
Project / Site name: New Victoria
Your Order No: 14284-AA-B

Lab Sample Number	1636113	1636114
Sample Reference	SW-MG-109	SW-MG-110
Sample Number	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied
Date Sampled	24/09/2020	24/09/2020
Time Taken	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection n

Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	14
Total mass of sample received	kg	0.001	NONE	0.3	0.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Amosite	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.8
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1
Total Sulphate as SO4	mg/kg	50	MCERTS	1500	1100
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	370	420
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.19	0.21
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	185	210
Sulphide	mg/kg	1	MCERTS	8.8	16
Total Sulphur	mg/kg	50	MCERTS	850	710

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	17	8
Acenaphthylene	mg/kg	0.05	MCERTS	5.7	2.5
Acenaphthene	mg/kg	0.05	MCERTS	12	8.4
Fluorene	mg/kg	0.05	MCERTS	19	11
Phenanthrene	mg/kg	0.05	MCERTS	100	73
Anthracene	mg/kg	0.05	MCERTS	24	17
Fluoranthene	mg/kg	0.05	MCERTS	97	70
Pyrene	mg/kg	0.05	MCERTS	93	70
Benzo(a)anthracene	mg/kg	0.05	MCERTS	54	34
Chrysene	mg/kg	0.05	MCERTS	42	34
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	59	39
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	11	8.9
Benzo(a)pyrene	mg/kg	0.05	MCERTS	45	30
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	17	12
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	5.7	4
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	21	15

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	623	436
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Analytical Report Number: 20-33044
 Project / Site name: New Victoria
 Your Order No: 14284-AA-B

Lab Sample Number	1636113	1636114
Sample Reference	SW-MG-109	SW-MG-110
Sample Number	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied
Date Sampled	24/09/2020	24/09/2020
Time Taken	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	22	24
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	23	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	200	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	530	370
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.3	0.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	230	140

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	59	18
TPH (C12 - C16)	mg/kg	4	MCERTS	140	71
TPH (C16 - C21)	mg/kg	1	MCERTS	650	320
TPH (C21 - C35)	mg/kg	1	MCERTS	600	260
TPH (C35 - C40)	mg/kg	10	MCERTS	100	39
TPH Total C5 - C40	mg/kg	10	MCERTS	1600	730

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 20-33044
Project / Site name: New Victoria
Your Order No: 14284-AA-B

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-PL 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
1636113	SW-MG-109		124	Loose Fibres	Amosite	< 0.001	< 0.001
1636114	SW-MG-110		130	Loose Fibres	Chrysotile	< 0.001	< 0.001

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



Analytical Report Number : 20-33044
Project / Site name: New Victoria

* 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 *
1636105	SW-MG-101	None Supplied	None Supplied	Brown loam and sand with gravel.
1636106	SW-MG-102	None Supplied	None Supplied	Brown loam and sand with gravel.
1636107	SW-MG-103	None Supplied	None Supplied	Brown loam and sand with gravel and brick.
1636108	SW-MG-104	None Supplied	None Supplied	Brown loam and sand with gravel and brick.
1636109	SW-MG-105	None Supplied	None Supplied	Brown loam and sand with gravel.
1636110	SW-MG-106	None Supplied	None Supplied	Brown loam and clay with gravel.
1636111	SW-MG-107	None Supplied	None Supplied	Brown loam and clay with gravel.
1636112	SW-MG-108	None Supplied	None Supplied	Brown loam and clay with gravel.
1636113	SW-MG-109	None Supplied	None Supplied	Brown loam and clay with gravel.
1636114	SW-MG-110	None Supplied	None Supplied	Brown clay and sand with gravel.



Analytical Report Number : 20-33044
Project / Site name: New Victoria

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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.	L038-PL	D	MCERTS
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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
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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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
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.	L038-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
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
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
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS



Analytical Report Number : 20-33044
Project / Site name: New Victoria

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

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



Sample Deviation Report

Analytical Report Number : 20-33044
Project / Site name: New Victoria

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SW-MG-101	None Supplied	S	1636105	c	Sulphide in soil	L010-PL	c
SW-MG-101	None Supplied	S	1636105	c	Total cyanide in soil	L080-PL	c
SW-MG-102	None Supplied	S	1636106	c	Sulphide in soil	L010-PL	c
SW-MG-102	None Supplied	S	1636106	c	Total cyanide in soil	L080-PL	c
SW-MG-103	None Supplied	S	1636107	c	Sulphide in soil	L010-PL	c
SW-MG-103	None Supplied	S	1636107	c	Total cyanide in soil	L080-PL	c
SW-MG-104	None Supplied	S	1636108	c	Sulphide in soil	L010-PL	c
SW-MG-104	None Supplied	S	1636108	c	Total cyanide in soil	L080-PL	c
SW-MG-105	None Supplied	S	1636109	c	Sulphide in soil	L010-PL	c
SW-MG-105	None Supplied	S	1636109	c	Total cyanide in soil	L080-PL	c
SW-MG-106	None Supplied	S	1636110	c	Sulphide in soil	L010-PL	c
SW-MG-106	None Supplied	S	1636110	c	Total cyanide in soil	L080-PL	c
SW-MG-107	None Supplied	S	1636111	c	Sulphide in soil	L010-PL	c
SW-MG-107	None Supplied	S	1636111	c	Total cyanide in soil	L080-PL	c
SW-MG-108	None Supplied	S	1636112	c	Sulphide in soil	L010-PL	c
SW-MG-108	None Supplied	S	1636112	c	Total cyanide in soil	L080-PL	c
SW-MG-109	None Supplied	S	1636113	c	Sulphide in soil	L010-PL	c
SW-MG-109	None Supplied	S	1636113	c	Total cyanide in soil	L080-PL	c
SW-MG-110	None Supplied	S	1636114	c	Sulphide in soil	L010-PL	c
SW-MG-110	None Supplied	S	1636114	c	Total cyanide in soil	L080-PL	c



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Analytical Report Number : 20-36425

Project / Site name:	New Victoria	Samples received on:	19/10/2020
Your job number:	14-284	Samples instructed on/ Analysis started on:	19/10/2020
Your order number:	14284-AA-I	Analysis completed by:	26/10/2020
Report Issue Number:	1	Report issued on:	26/10/2020
Samples Analysed:	13 soil samples		

Signed:

Will Fardon
Technical Reviewer (CS Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 20-36425
 Project / Site name: New Victoria
 Your Order No: 14284-AA-I

Lab Sample Number				1655826	1655827	1655828	1655829
Sample Reference				SW-MG 120	SW-MG 121	SW-MG 122	SW-MG 123
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020	16/10/2020	16/10/2020
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	9.7	9.7	10	8.5
Total mass of sample received	kg	0.001	NONE	0.5	0.5	0.5	0.5

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
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8	9.7	8.4	8
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1
Total Sulphate as SO4	mg/kg	50	MCERTS	870	770	840	620
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	270	240	470	140
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.14	0.12	0.24	0.072
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	136	122	237	71.5
Sulphide	mg/kg	1	MCERTS	12	10	38	17
Total Sulphur	mg/kg	50	MCERTS	560	390	700	380

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	4	0.42	0.37	0.27
Acenaphthylene	mg/kg	0.05	MCERTS	0.81	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1.8	1.1	0.34	0.5
Fluorene	mg/kg	0.05	MCERTS	2.5	0.89	0.32	0.39
Phenanthrene	mg/kg	0.05	MCERTS	16	8.3	3.6	3.7
Anthracene	mg/kg	0.05	MCERTS	3.4	1.8	0.77	0.82
Fluoranthene	mg/kg	0.05	MCERTS	16	11	5.5	4.8
Pyrene	mg/kg	0.05	MCERTS	16	10	5	4.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	8.7	5.8	2.8	2.5
Chrysene	mg/kg	0.05	MCERTS	8	5.7	2.8	1.9
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	8.8	6	2.8	3.1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	4	2.9	1.5	0.84
Benzo(a)pyrene	mg/kg	0.05	MCERTS	7.9	5.4	2.5	2.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	3.6	2.8	1.3	1.2
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.1	0.81	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.3	3.3	1.6	1.5

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	106	66.3	31.2	28.3
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	7.7	17	5.4
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	18	11	9.6	8.7
Copper (aqua regia extractable)	mg/kg	1	MCERTS	47	45	51	43
Lead (aqua regia extractable)	mg/kg	1	MCERTS	250	210	190	190
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	2.5	1.2	0.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	12	13	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	91	160	71



Analytical Report Number: 20-36425

Project / Site name: New Victoria

Your Order No: 14284-AA-I

Lab Sample Number				1655826	1655827	1655828	1655829
Sample Reference				SW-MG 120	SW-MG 121	SW-MG 122	SW-MG 123
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020	16/10/2020	16/10/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	8	8.5	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	MCERTS	16	18	8.9	11
TPH (C16 - C21)	mg/kg	1	MCERTS	65	67	26	32
TPH (C21 - C35)	mg/kg	1	MCERTS	80	42	44	42
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH Total C5 - C40	mg/kg	10	MCERTS	180	150	81	86

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-36425

Project / Site name: New Victoria

Your Order No: 14284-AA-I

Lab Sample Number				1655830	1655831	1655832	1655833
Sample Reference				SW-MG 124	SW-MG 125	SW-MG 126	SW-MG 127
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020	16/10/2020	16/10/2020
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	9.9	11	8.8	2.3
Total mass of sample received	kg	0.001	NONE	0.5	0.5	0.4	0.5

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
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	10.7	9.1	9.7	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1
Total Sulphate as SO4	mg/kg	50	MCERTS	5000	1200	340	350
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	630	290	73	63
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.31	0.14	0.037	0.031
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	314	144	36.5	31.4
Sulphide	mg/kg	1	MCERTS	97	230	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	1600	660	160	150

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	8.9	2.4	1.1	0.46
Acenaphthylene	mg/kg	0.05	MCERTS	6.7	0.8	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	5.3	2	0.62	1.1
Fluorene	mg/kg	0.05	MCERTS	5.6	2.2	0.55	0.79
Phenanthrene	mg/kg	0.05	MCERTS	28	18	4.7	7.2
Anthracene	mg/kg	0.05	MCERTS	6.8	4	1	1.6
Fluoranthene	mg/kg	0.05	MCERTS	27	22	5.6	9.1
Pyrene	mg/kg	0.05	MCERTS	24	22	5.5	8.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	14	12	3	4.6
Chrysene	mg/kg	0.05	MCERTS	12	11	2.8	4
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	14	12	3.1	3.8
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	6.8	6	1.5	2.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	12	11	2.7	3.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	6.3	5.7	1.4	1.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.1	1.6	< 0.05	0.44
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	7	6.6	1.8	2.2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	186	140	35.4	51.4
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.8	14	5.2	5.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	< 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	20	21	9.2	9.2
Copper (aqua regia extractable)	mg/kg	1	MCERTS	43	79	30	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	96	300	110	100
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.7	0.7	0.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	17	8.8	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	95	210	69	61



Analytical Report Number: 20-36425

Project / Site name: New Victoria

Your Order No: 14284-AA-I

Lab Sample Number				1655830	1655831	1655832	1655833
Sample Reference				SW-MG 124	SW-MG 125	SW-MG 126	SW-MG 127
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020	16/10/2020	16/10/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Petroleum Hydrocarbons							
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	18	9.9	6	6.3
TPH (C12 - C16)	mg/kg	4	MCERTS	55	29	9.5	17
TPH (C16 - C21)	mg/kg	1	MCERTS	200	160	18	51
TPH (C21 - C35)	mg/kg	1	MCERTS	630	320	28	72
TPH (C35 - C40)	mg/kg	10	MCERTS	34	< 10	< 10	14
TPH Total C5 - C40	mg/kg	10	MCERTS	960	540	70	170

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-36425

Project / Site name: New Victoria

Your Order No: 14284-AA-I

Lab Sample Number				1655834	1655835	1655836	1655837
Sample Reference				SW-MG 128	SW-MG 129	SW-MG 130	SW-MG 131
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020	16/10/2020	16/10/2020
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	14	13	13	15
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.5

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
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.5	9	10.9	10.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1100	1000	1200	3600
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	220	290	290	1500
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.11	0.15	0.15	0.73
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	110	145	146	728
Sulphide	mg/kg	1	MCERTS	33	13	14	30
Total Sulphur	mg/kg	50	MCERTS	540	490	640	1600

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	8.1	3.5	6.4	6.7
Acenaphthylene	mg/kg	0.05	MCERTS	0.86	0.93	0.42	0.43
Acenaphthene	mg/kg	0.05	MCERTS	9.1	2.3	6.2	5.3
Fluorene	mg/kg	0.05	MCERTS	8.8	2.8	4.9	4.8
Phenanthrene	mg/kg	0.05	MCERTS	57	23	35	25
Anthracene	mg/kg	0.05	MCERTS	13	4.9	8.6	6
Fluoranthene	mg/kg	0.05	MCERTS	60	26	42	25
Pyrene	mg/kg	0.05	MCERTS	54	25	37	22
Benzo(a)anthracene	mg/kg	0.05	MCERTS	28	13	20	12
Chrysene	mg/kg	0.05	MCERTS	22	11	13	9.7
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	22	12	15	11
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	11	4	7	3.8
Benzo(a)pyrene	mg/kg	0.05	MCERTS	21	9.9	16	9.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	8.7	4.5	6.6	4.3
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.4	1.2	1.3	1.1
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	10	5.2	8.1	4.9

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	336	150	227	151
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	15	14	11
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.6	0.5	0.6
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	25	18	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	86	69	58	250
Lead (aqua regia extractable)	mg/kg	1	MCERTS	310	370	290	140
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.8	0.8	0.5	0.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	20	17	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	170	170	130	110



Analytical Report Number: 20-36425

Project / Site name: New Victoria

Your Order No: 14284-AA-I

Lab Sample Number				1655834	1655835	1655836	1655837
Sample Reference				SW-MG 128	SW-MG 129	SW-MG 130	SW-MG 131
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020	16/10/2020	16/10/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accred- itation Status				
Petroleum Hydrocarbons							
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	27	7.9	15	28
TPH (C12 - C16)	mg/kg	4	MCERTS	46	25	36	39
TPH (C16 - C21)	mg/kg	1	MCERTS	210	120	150	130
TPH (C21 - C35)	mg/kg	1	MCERTS	260	150	150	460
TPH (C35 - C40)	mg/kg	10	MCERTS	31	< 10	< 10	220
TPH Total C5 - C40	mg/kg	10	MCERTS	600	310	370	900

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-36425

Project / Site name: New Victoria

Your Order No: 14284-AA-I

Lab Sample Number				1655838
Sample Reference				SW-MG 132
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				16/10/2020
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	13
Total mass of sample received	kg	0.001	NONE	0.4

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	9
Total Cyanide	mg/kg	1	MCERTS	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	370
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	100
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.05
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	49.9
Sulphide	mg/kg	1	MCERTS	7.1
Total Sulphur	mg/kg	50	MCERTS	160

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	28
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	9.2
Fluorene	mg/kg	0.05	MCERTS	8.1
Phenanthrene	mg/kg	0.05	MCERTS	47
Anthracene	mg/kg	0.05	MCERTS	9.5
Fluoranthene	mg/kg	0.05	MCERTS	34
Pyrene	mg/kg	0.05	MCERTS	33
Benzo(a)anthracene	mg/kg	0.05	MCERTS	14
Chrysene	mg/kg	0.05	MCERTS	14
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	14
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.9
Benzo(a)pyrene	mg/kg	0.05	MCERTS	11
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	5
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.4
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.8

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	238
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6
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	8
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28
Lead (aqua regia extractable)	mg/kg	1	MCERTS	140
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.5
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	78



Analytical Report Number: 20-36425
 Project / Site name: New Victoria
 Your Order No: 14284-AA-I

Lab Sample Number				1655838
Sample Reference				SW-MG 132
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				16/10/2020
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Petroleum Hydrocarbons				
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	54
TPH (C12 - C16)	mg/kg	4	MCERTS	67
TPH (C16 - C21)	mg/kg	1	MCERTS	170
TPH (C21 - C35)	mg/kg	1	MCERTS	150
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10
TPH Total C5 - C40	mg/kg	10	MCERTS	500

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 20-36425
Project / Site name: New Victoria
Your Order No: 14284-AA-I

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-PL 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
1655831	SW-MG 125		133	Loose Fibres	Chrysotile	< 0.001	< 0.001

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



Analytical Report Number : 20-36425
Project / Site name: New Victoria

* 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 *
1655826	SW-MG 120	None Supplied	None Supplied	Brown loam and sand with gravel.
1655827	SW-MG 121	None Supplied	None Supplied	Brown loam and sand with gravel.
1655828	SW-MG 122	None Supplied	None Supplied	Brown loam and sand with gravel.
1655829	SW-MG 123	None Supplied	None Supplied	Brown loam and sand with gravel.
1655830	SW-MG 124	None Supplied	None Supplied	Brown loam and clay with gravel and vegetation.
1655831	SW-MG 125	None Supplied	None Supplied	Brown loam and clay with gravel.
1655832	SW-MG 126	None Supplied	None Supplied	Brown loam and sand with gravel.
1655833	SW-MG 127	None Supplied	None Supplied	Brown sand with gravel.
1655834	SW-MG 128	None Supplied	None Supplied	Brown loam and sand with gravel.
1655835	SW-MG 129	None Supplied	None Supplied	Brown loam and sand with gravel.
1655836	SW-MG 130	None Supplied	None Supplied	Brown loam and sand with gravel.
1655837	SW-MG 131	None Supplied	None Supplied	Brown loam and clay with gravel.
1655838	SW-MG 132	None Supplied	None Supplied	Brown loam and sand with gravel.



Analytical Report Number : 20-36425
Project / Site name: New Victoria

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

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.	L038-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
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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
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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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 sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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
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.	L038-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
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
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
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS



Analytical Report Number : 20-36425
Project / Site name: New Victoria

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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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 : 20-36435

Project / Site name:	New Victoria	Samples received on:	19/10/2020
Your job number:	14-284	Samples instructed on/ Analysis started on:	19/10/2020
Your order number:	14284-AA-J	Analysis completed by:	26/10/2020
Report Issue Number:	1	Report issued on:	26/10/2020
Samples Analysed:	6 soil samples		

Signed:

Will Fardon
Technical Reviewer (CS Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 20-36435
 Project / Site name: New Victoria
 Your Order No: 14284-AA-J

Lab Sample Number				1655923	1655924	1655925	1655926
Sample Reference				IM-C 101	IM-C 102	IM-C 103	IM-C 104
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020	16/10/2020	16/10/2020
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	8.9	9.7	9.1	8.9
Total mass of sample received	kg	0.001	NONE	0.5	0.4	0.4	0.4

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	7.3	7.3	7.2
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	240	250	250	220
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.054	0.042	0.031	0.032
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	110	85	63	64
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	54.4	42.3	31.3	31.9
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	83	74	67	80

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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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
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.1	1	1.3
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	13	12	13	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	3.3	3	3.5	2.9
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	16	12	15
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	12	13	12	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	34	31	30	32



Analytical Report Number: 20-36435
 Project / Site name: New Victoria
 Your Order No: 14284-AA-J

Lab Sample Number				1655923	1655924	1655925	1655926
Sample Reference				IM-C 101	IM-C 102	IM-C 103	IM-C 104
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020	16/10/2020	16/10/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH Total C5 - C40	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-36435
 Project / Site name: New Victoria
 Your Order No: 14284-AA-J

Lab Sample Number				1655927	1655928
Sample Reference				IM-C 105	IM-C 106
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020
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	8.6
Total mass of sample received	kg	0.001	NONE	0.5	0.4

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.4	7.2
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	160	250
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.018	0.025
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	36	51
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	18	25.3
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	68	68

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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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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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	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	13	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	3.8	2.5
Lead (aqua regia extractable)	mg/kg	1	MCERTS	10	9.7
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	10
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	31	24



Analytical Report Number: 20-36435
 Project / Site name: New Victoria
 Your Order No: 14284-AA-J

Lab Sample Number				1655927	1655928
Sample Reference				IM-C 105	IM-C 106
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				16/10/2020	16/10/2020
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection
Petroleum Hydrocarbons				Accreditation Status	
TPH (C5 - C6)				mg/kg	1
TPH (C6 - C8)				mg/kg	0.1
TPH (C8 - C10)				mg/kg	0.1
TPH (C10 - C12)				mg/kg	2
TPH (C12 - C16)				mg/kg	4
TPH (C16 - C21)				mg/kg	1
TPH (C21 - C35)				mg/kg	1
TPH (C35 - C40)				mg/kg	10
TPH Total C5 - C40				mg/kg	10
				NONE	< 1.0
				MCERTS	< 0.1
				MCERTS	< 0.1
				MCERTS	< 2.0
				MCERTS	< 4.0
				MCERTS	< 1.0
				MCERTS	< 1.0
				MCERTS	< 10
				MCERTS	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 20-36435
Project / Site name: New Victoria

* 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 *
1655923	IM-C 101	None Supplied	None Supplied	Brown loam and sand with gravel.
1655924	IM-C 102	None Supplied	None Supplied	Brown loam and sand with gravel.
1655925	IM-C 103	None Supplied	None Supplied	Brown loam and sand with gravel.
1655926	IM-C 104	None Supplied	None Supplied	Brown loam and sand with gravel.
1655927	IM-C 105	None Supplied	None Supplied	Brown loam and sand with gravel.
1655928	IM-C 106	None Supplied	None Supplied	Brown loam and sand with gravel.



Analytical Report Number : 20-36435
Project / Site name: New Victoria

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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.	L038-PL	D	MCERTS
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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
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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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
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.	L038-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
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	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
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS



Analytical Report Number : 20-36435
Project / Site name: New Victoria

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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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 : 20-36862

Project / Site name:	New Victoria	Samples received on:	20/10/2020
Your job number:	14-284	Samples instructed on/ Analysis started on:	22/10/2020
Your order number:	14284-AA-K	Analysis completed by:	28/10/2020
Report Issue Number:	1	Report issued on:	28/10/2020
Samples Analysed:	2 soil samples		

Signed:

Will Fardon
Technical Reviewer (CS Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 20-36862

Project / Site name: New Victoria

Your Order No: 14284-AA-K

Lab Sample Number				1658254	1658255
Sample Reference				SW-MG 133	SW-MG 134
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				19/10/2020	19/10/2020
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection
Stone Content				%	0.1
Moisture Content				%	N/A
Total mass of sample received				kg	0.001

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	9.2
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1600	1400
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	680	720
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.34	0.36
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	341	362
Sulphide	mg/kg	1	MCERTS	72	1.6
Total Sulphur	mg/kg	50	MCERTS	710	810

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	5.3	3.9
Acenaphthylene	mg/kg	0.05	MCERTS	0.65	1.1
Acenaphthene	mg/kg	0.05	MCERTS	4.1	5.4
Fluorene	mg/kg	0.05	MCERTS	4	5.2
Phenanthrene	mg/kg	0.05	MCERTS	35	59
Anthracene	mg/kg	0.05	MCERTS	6.5	13
Fluoranthene	mg/kg	0.05	MCERTS	26	50
Pyrene	mg/kg	0.05	MCERTS	26	44
Benzo(a)anthracene	mg/kg	0.05	MCERTS	15	25
Chrysene	mg/kg	0.05	MCERTS	11	22
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	12	22
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	4	7.4
Benzo(a)pyrene	mg/kg	0.05	MCERTS	9.5	18
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.8	8.6
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.3	2.2
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.9	9.8

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	171	296
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	40
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	100	130
Lead (aqua regia extractable)	mg/kg	1	MCERTS	670	460
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.3	0.9
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	220	200



Analytical Report Number: 20-36862
 Project / Site name: New Victoria
 Your Order No: 14284-AA-K

Lab Sample Number				1658254	1658255
Sample Reference				SW-MG 133	SW-MG 134
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				19/10/2020	19/10/2020
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection
				Accreditation Status	
Petroleum Hydrocarbons					
TPH (C5 - C6)		mg/kg	1	NONE	< 1.0
TPH (C6 - C8)		mg/kg	0.1	MCERTS	< 0.1
TPH (C8 - C10)		mg/kg	0.1	MCERTS	< 0.1
TPH (C10 - C12)		mg/kg	2	MCERTS	11
TPH (C12 - C16)		mg/kg	4	MCERTS	27
TPH (C16 - C21)		mg/kg	1	MCERTS	150
TPH (C21 - C35)		mg/kg	1	MCERTS	300
TPH (C35 - C40)		mg/kg	10	MCERTS	140
TPH Total C5 - C40		mg/kg	10	MCERTS	640

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 20-36862
Project / Site name: New Victoria

* 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 *
1658254	SW-MG 133	None Supplied	None Supplied	Brown loam and clay with gravel.
1658255	SW-MG 134	None Supplied	None Supplied	Brown loam and clay with gravel.



Analytical Report Number : 20-36862
Project / Site name: New Victoria

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
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.	L038-PL	D	MCERTS
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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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
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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-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
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.	L038-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
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	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
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS



Analytical Report Number : 20-36862
Project / Site name: New Victoria

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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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 : 20-39814

Project / Site name:	New Victoria	Samples received on:	05/11/2020
Your job number:	14-284	Samples instructed on/ Analysis started on:	05/11/2020
Your order number:	14284-AA-L	Analysis completed by:	12/11/2020
Report Issue Number:	1	Report issued on:	12/11/2020
Samples Analysed:	6 leachate samples		

Signed: 

Agnieszka Czerwińska
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-39814
Project / Site name: New Victoria

Your Order No: 14284-AA-L

Lab Sample Number	1674949	1674950	1674951	1674952
Sample Reference	SW-MG 135	SW-MG 136	SW-MG 137	SW-MG 138
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	05/11/2020	05/11/2020	05/11/2020	05/11/2020
Time Taken	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	11.5	11.8	11.3	11.5
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	4.3	3.3

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	8.8	10	14	9.4
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 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
Benzo(ghi)perylene	µg/l	0.01	NONE	< 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
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	4.5	8	3.8
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	12	12	15	17
Chromium (dissolved)	µg/l	0.4	ISO 17025	15	14	17	22
Copper (dissolved)	µg/l	0.7	ISO 17025	58	53	50	67
Lead (dissolved)	µg/l	1	ISO 17025	5.3	6.6	7	6.8
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	< 0.3	2.7	0.9	1.7
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	7.3	4.5	6.1	16

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10

Analytical Report Number: 20-39814
Project / Site name: New Victoria

Your Order No: 14284-AA-L

Lab Sample Number	1674949	1674950	1674951	1674952
Sample Reference	SW-MG 135	SW-MG 136	SW-MG 137	SW-MG 138
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	05/11/2020	05/11/2020	05/11/2020	05/11/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accred- itation Status	

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	410	< 10
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TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 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
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	28	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	270	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	110	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	410	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 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
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 20-39814
Project / Site name: New Victoria

Your Order No: 14284-AA-L

Lab Sample Number					1674953	1674954
Sample Reference					SW-MG 139	SW-MG 140
Sample Number					None Supplied	None Supplied
Depth (m)					None Supplied	None Supplied
Date Sampled					05/11/2020	05/11/2020
Time Taken					None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)		Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	11.6	11.5
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	1.7	< 1.0

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	6.2	5.6
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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
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	14	13
Chromium (dissolved)	µg/l	0.4	ISO 17025	18	15
Copper (dissolved)	µg/l	0.7	ISO 17025	61	56
Lead (dissolved)	µg/l	1	ISO 17025	6.1	5.4
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.7	0.6
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	6.7	5.8

Monoaromatics & Oxygenates

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

Analytical Report Number: 20-39814
Project / Site name: New Victoria

Your Order No: 14284-AA-L

Lab Sample Number				1674953	1674954
Sample Reference				SW-MG 139	SW-MG 140
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				05/11/2020	05/11/2020
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detecti on	Accredi- tation Status		

Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10
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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

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 20-39814

Project / Site name: New Victoria

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-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
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	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
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
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In house method.	L005-PL	W	ISO 17025
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
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
Total cyanide in leachate - 1µg/l	Determination of total cyanide 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

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.

APPENDIX V

PHOTOGRAPHS

PLATE 1 CULVERT (RIVER IRK) CROSSING POINT



PLATE 2 EXCAVATION, BREAKING OUT AND PROCESSING



PLATE 3 EXCAVATION, BREAKING OUT AND PROCESSING



PLATE 4 EXCAVATION, BREAKING OUT AND PROCESSING



PLATE 5 TURNOVER AND PROCESSING



PLATE 6 TURNOVER, PROCESSING AND COMPACTION



PLATE 7 WORKING PLATFORM CONSTRUCTED WITH MPORTED 6F2



PLATE 8 IMPORTED QUARRIED 6F2



APPENDIX VI

GEOTECHNICAL TESTING

RESULTS



TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



PSD Assessment of material for use in Earthworks

Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client: E3P
Client Address: Taylor Road, Urmston
Manchester
M41 7JQ
Contact: Andrew Allcock
Site Address: New Victoria

Client Reference: 14-284
Job Number: 20-31429
Date Sampled: 17/09/2020
Date Received: 21/09/2020
Date Tested: 24/09/2020
Sampled By: Client - A. Allcock

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

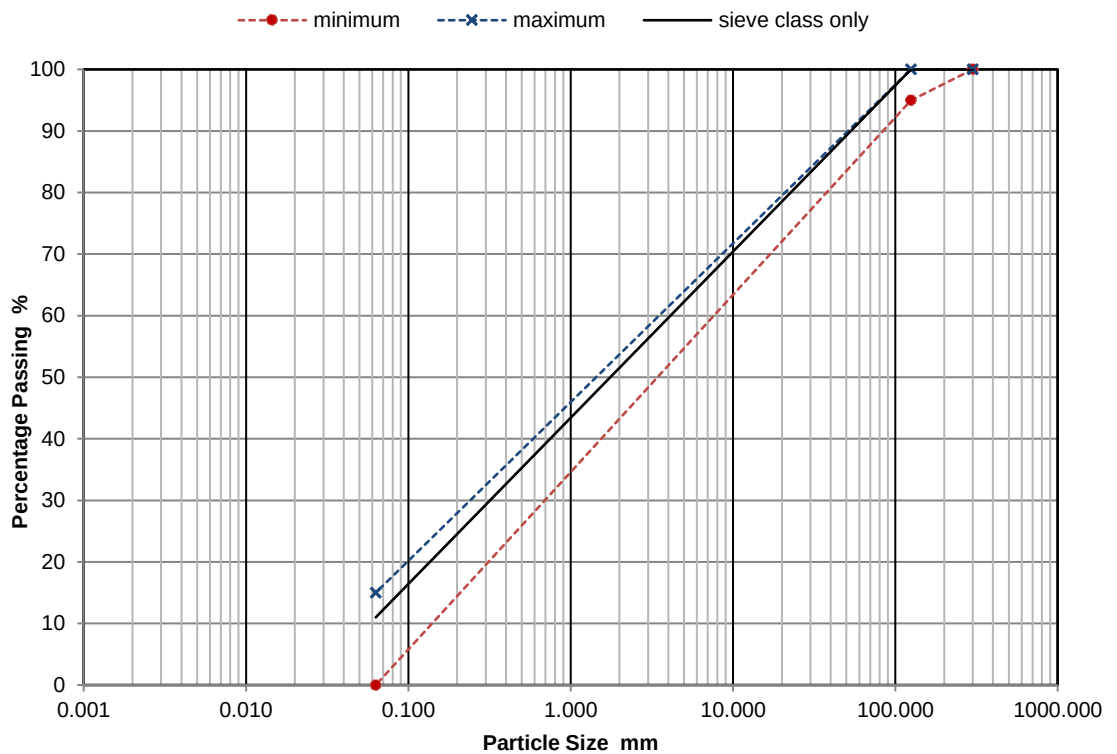
Test Results:

Laboratory Reference: 1627644
Hole No.: SW-MG-101
Sample Reference: Not Given
Sample Description: Dark brown clayey very sandy GRAVEL with fragments of brick, glass, slag (MADE GROUND)
Sample Preparation: Sample was whole tested, oven dried at 106.3 °C and broken down by hand.
Depth Top [m]: Not Given
Depth Base [m]: Not Given
Sample Type: B

Material Type

1A

PSD test result	
Size mm	Passing %
500	100
300	100
150	100
125	100
90	100
75	100
63	100
50	98
37.5	94
28	91
20	78
14	63
10	60
6.3	54
5	53
3.35	49
2	44
1.18	40
0.6	35
0.425	32
0.3	27
0.212	20
0.15	16
0.063	11



Comparison based on each grading size

No.	size mm	%passing 1A	
		min	max
1	300	100	100
2	125	95	100
3	0.063	0	15

sieve result %passing	Pass or fail
100	PASS
100	PASS
11	PASS

This sample meets the particle size requirements for material type - 1A
Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: UC ≥ 163.5

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing. This report includes a statement of conformity to an industry standard specification, as such risks associated with uncertainty in relation to the decision rules applied do not need to be considered.

Signed:

Page 1 of 1

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2020

GF 127.22



TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



PSD Assessment of material for use in Earthworks

Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client: E3P
Client Address: Taylor Road, Urmston
Manchester
M41 7JQ
Contact: Andrew Allcock
Site Address: New Victoria

Client Reference: 14-284
Job Number: 20-31429
Date Sampled: 17/09/2020
Date Received: 21/09/2020
Date Tested: 24/09/2020
Sampled By: Client - A. Allcock

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

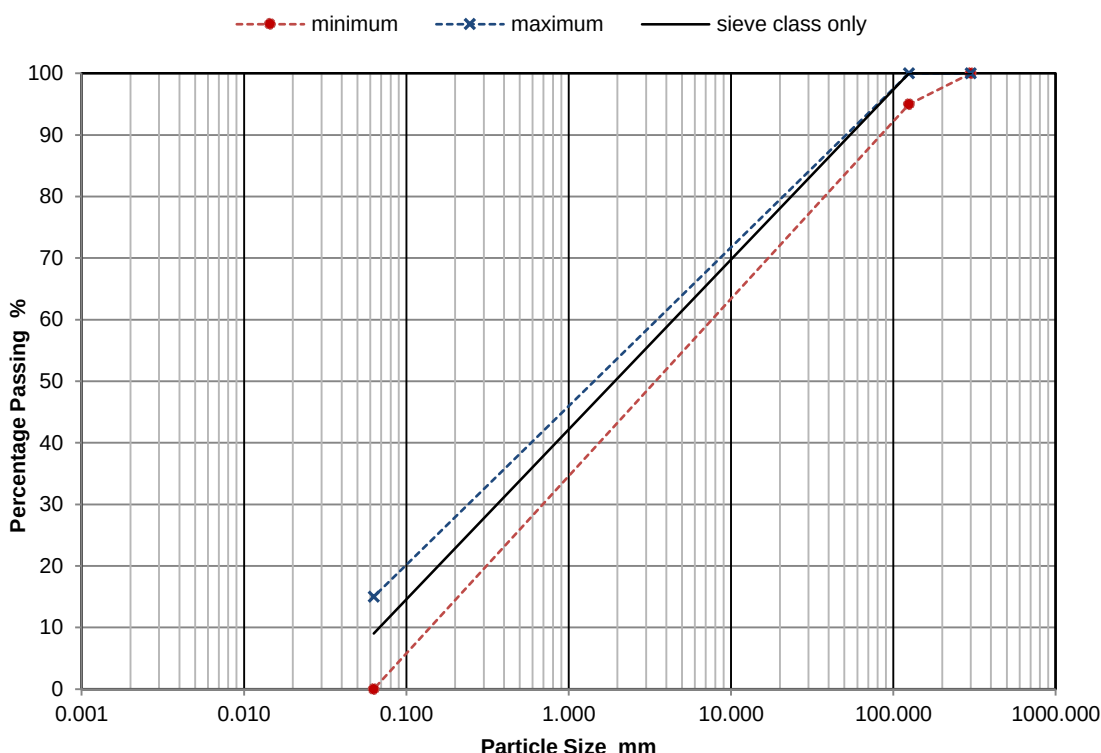
Laboratory Reference: 1627645
Hole No.: SW-MG-102
Sample Reference: Not Given
Sample Description: Dark brown clayey very sandy GRAVEL with fragments of brick, crushed concrete, slag, glass (MADE GROUND)
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: Not Given
Depth Base [m]: Not Given
Sample Type: B

Material Type

1A

PSD test result	
Size mm	Passing %
500	100
300	100
150	100
125	100
90	100
75	100
63	100
50	100
37.5	100
28	90
20	77
14	62
10	55
6.3	48
5	46
3.35	43
2	40
1.18	37
0.6	33
0.425	29
0.3	24
0.212	18
0.15	14
0.063	9



Comparison based on each grading size

No.	size mm	%passing 1A	
		min	max
1	300	100	100
2	125	95	100
3	0.063	0	15

sieve result %passing	Pass or fail
100	PASS
100	PASS
9	PASS

This sample meets the particle size requirements for material type - 1A
Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: UC = 169.8

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing. This report includes a statement of conformity to an industry standard specification, as such risks associated with uncertainty in relation to the decision rules applied do not need to be considered.

Signed:

Page 1 of 1

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2020

GF 127.22



TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



PSD Assessment of material for use in Earthworks

Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client: E3P
Client Address: Taylor Road, Urmston
Manchester
M41 7JQ
Contact: Andrew Allcock
Site Address: New Victoria

Client Reference: 14-284
Job Number: 20-31429
Date Sampled: 17/09/2020
Date Received: 21/09/2020
Date Tested: 24/09/2020
Sampled By: Client - A. Allcock

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

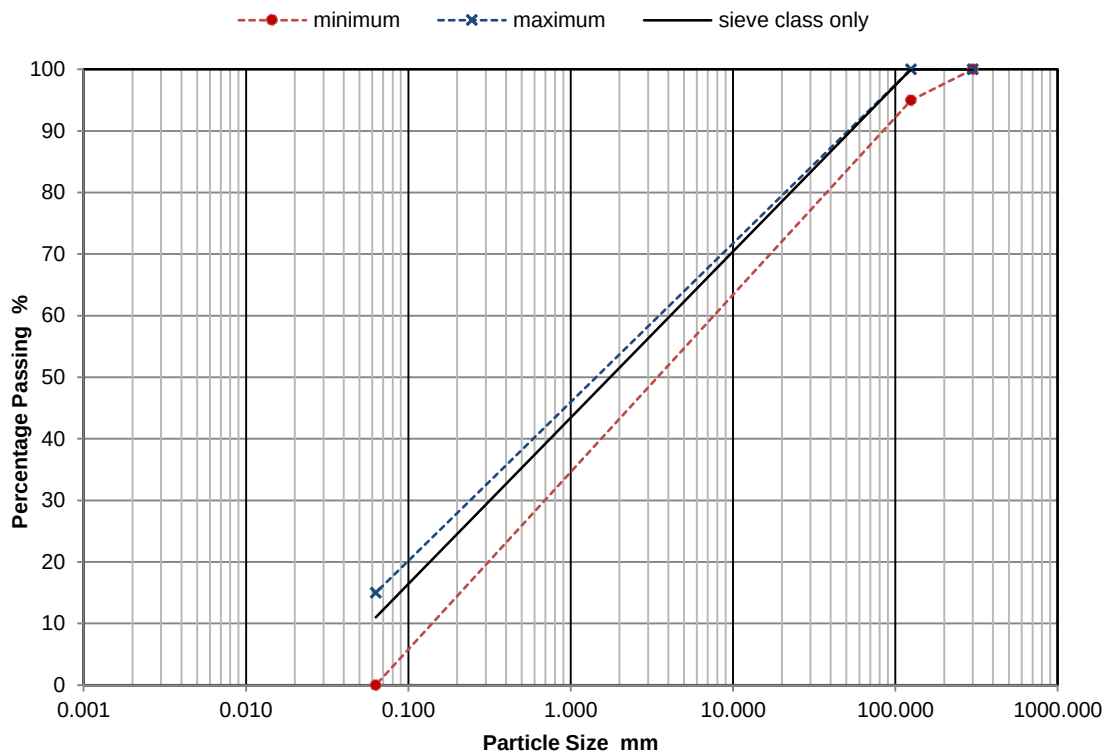
Test Results:

Laboratory Reference: 1627646
Hole No.: SW-MG-103
Sample Reference: Not Given
Sample Description: Dark brown clayey very sandy GRAVEL with fragments of brick, crushed concrete, slag, glass (MADE GROUND)
Sample Preparation: Sample was whole tested, oven dried at 106.3 °C and broken down by hand.
Depth Top [m]: Not Given
Depth Base [m]: Not Given
Sample Type: B

Material Type

1A

PSD test result	
Size mm	Passing %
500	100
300	100
150	100
125	100
90	100
75	100
63	100
50	98
37.5	96
28	90
20	81
14	64
10	55
6.3	49
5	46
3.35	43
2	38
1.18	35
0.6	32
0.425	29
0.3	24
0.212	19
0.15	16
0.063	11



Comparison based on each grading size

No.	size mm	%passing 1A	
		min	max
1	300	100	100
2	125	95	100
3	0.063	0	15

sieve result %passing	Pass or fail
100	PASS
100	PASS
11	PASS

This sample meets the particle size requirements for material type - 1A
Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: UC ≥ 188.9

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing. This report includes a statement of conformity to an industry standard specification, as such risks associated with uncertainty in relation to the decision rules applied do not need to be considered.

Signed:

Page 1 of 1

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2020

GF 127.22



TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



PSD Assessment of material for use in Earthworks

Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client: E3P
Client Address: Taylor Road, Urmston
Manchester
M41 7JQ
Contact: Andrew Allcock
Site Address: New Victoria

Client Reference: 14-284
Job Number: 20-31429
Date Sampled: 17/09/2020
Date Received: 21/09/2020
Date Tested: 24/09/2020
Sampled By: Client - A. Allcock

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

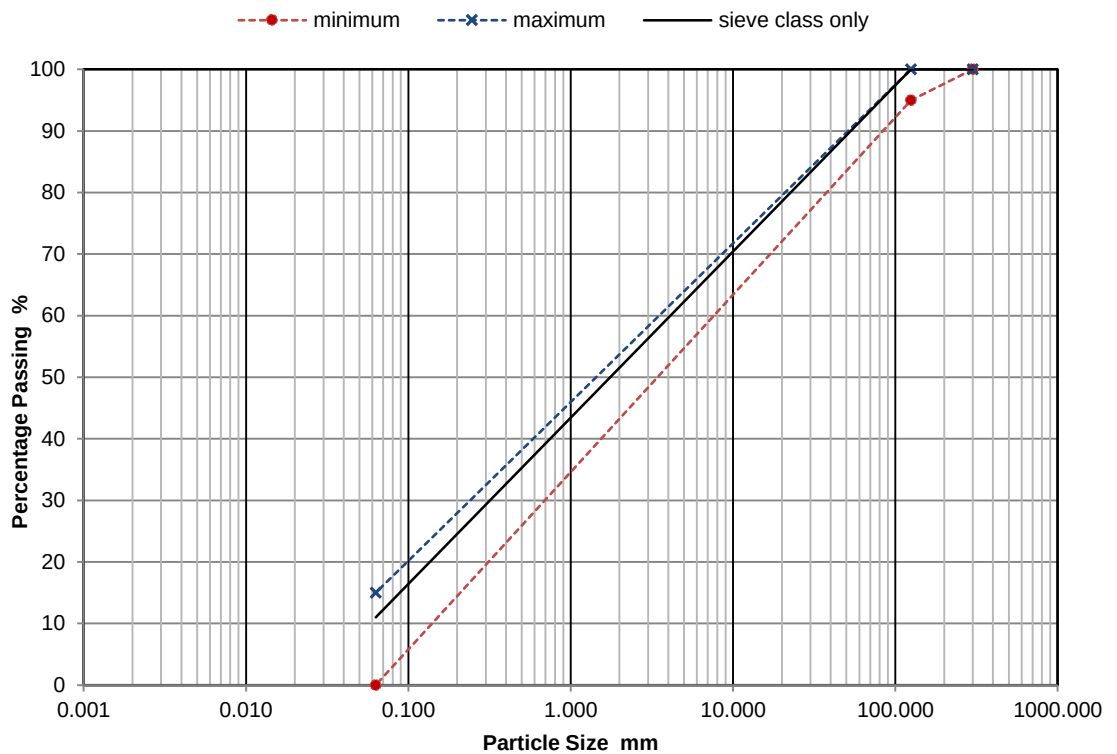
Test Results:

Laboratory Reference: 1627647
Hole No.: SW-MG-104
Sample Reference: Not Given
Sample Description: Dark brown clayey very sandy GRAVEL with fragments of brick, crushed concrete, slag (MADE GROUND)
Sample Preparation: Sample was whole tested, oven dried at 106.3 °C and broken down by hand.
Depth Top [m]: Not Given
Depth Base [m]: Not Given
Sample Type: B

Material Type

1A

PSD test result	
Size mm	Passing %
500	100
300	100
150	100
125	100
90	100
75	100
63	100
50	100
37.5	97
28	89
20	77
14	65
10	60
6.3	52
5	50
3.35	47
2	43
1.18	40
0.6	36
0.425	32
0.3	27
0.212	21
0.15	16
0.063	11



Comparison based on each grading size

No.	size mm	%passing 1A	
		min	max
1	300	100	100
2	125	95	100
3	0.063	0	15

sieve result %passing	Pass or fail
100	PASS
100	PASS
11	PASS

This sample meets the particle size requirements for material type - 1A
Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: UC ≥ 161.9

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Signed:

Page 1 of 1

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2020

GF 127.22



TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



PSD Assessment of material for use in Earthworks

Tested in Accordance with: BS 1377-2:1990: Clause 9.2

Client: E3P
Client Address: Taylor Road, Urmston
Manchester
M41 7JQ
Contact: Andrew Allcock
Site Address: New Victoria

Client Reference: 14-284
Job Number: 20-31429
Date Sampled: 17/09/2020
Date Received: 21/09/2020
Date Tested: 24/09/2020
Sampled By: Client - A. Allcock

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

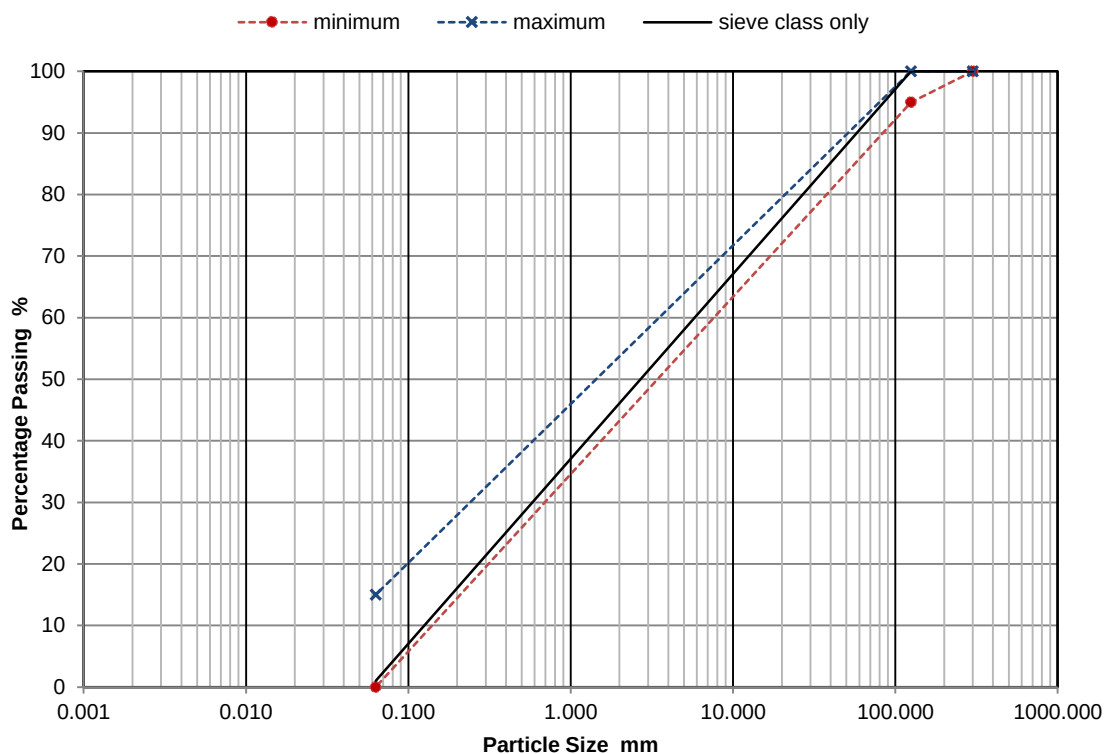
Laboratory Reference: 1627648
Hole No.: SW-MG-105
Sample Reference: Not Given
Sample Description: Dark brown sandy GRAVEL with fragments of brick, glass, slag, crushed concrete (MADE GROUND)
Sample Preparation: Sample was quartered, oven dried at 106.2 °C and broken down by hand.

Depth Top [m]: Not Given
Depth Base [m]: Not Given
Sample Type: B

Material Type

1A

PSD test result	
Size mm	Passing %
500	100
300	100
150	100
125	100
90	100
75	100
63	98
50	96
37.5	92
28	85
20	72
14	54
10	47
6.3	38
5	36
3.35	31
2	26
1.18	20
0.6	14
0.425	11
0.3	7
0.212	4
0.15	3
0.063	1



Comparison based on each grading size

No.	size mm	%passing 1A	
		min	max
1	300	100	100
2	125	95	100
3	0.063	0	15

sieve result %passing	Pass or fail
100	PASS
100	PASS
1	PASS

This sample meets the particle size requirements for material type - 1A
Specification for Highway Works, Volume 1, Series 600, TABLE 6/2

Remarks: UC = 40.2

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Signed:

Page 1 of 1

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2020

GF 127.22



TEST CERTIFICATE
Dry Density / Moisture Content
Relationship Heavy Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: E3P
Client Address: Taylor Road, Urmston,
Manchester, M41 7JQ

Contact: Andrew Allcock
Site Address: New Victoria

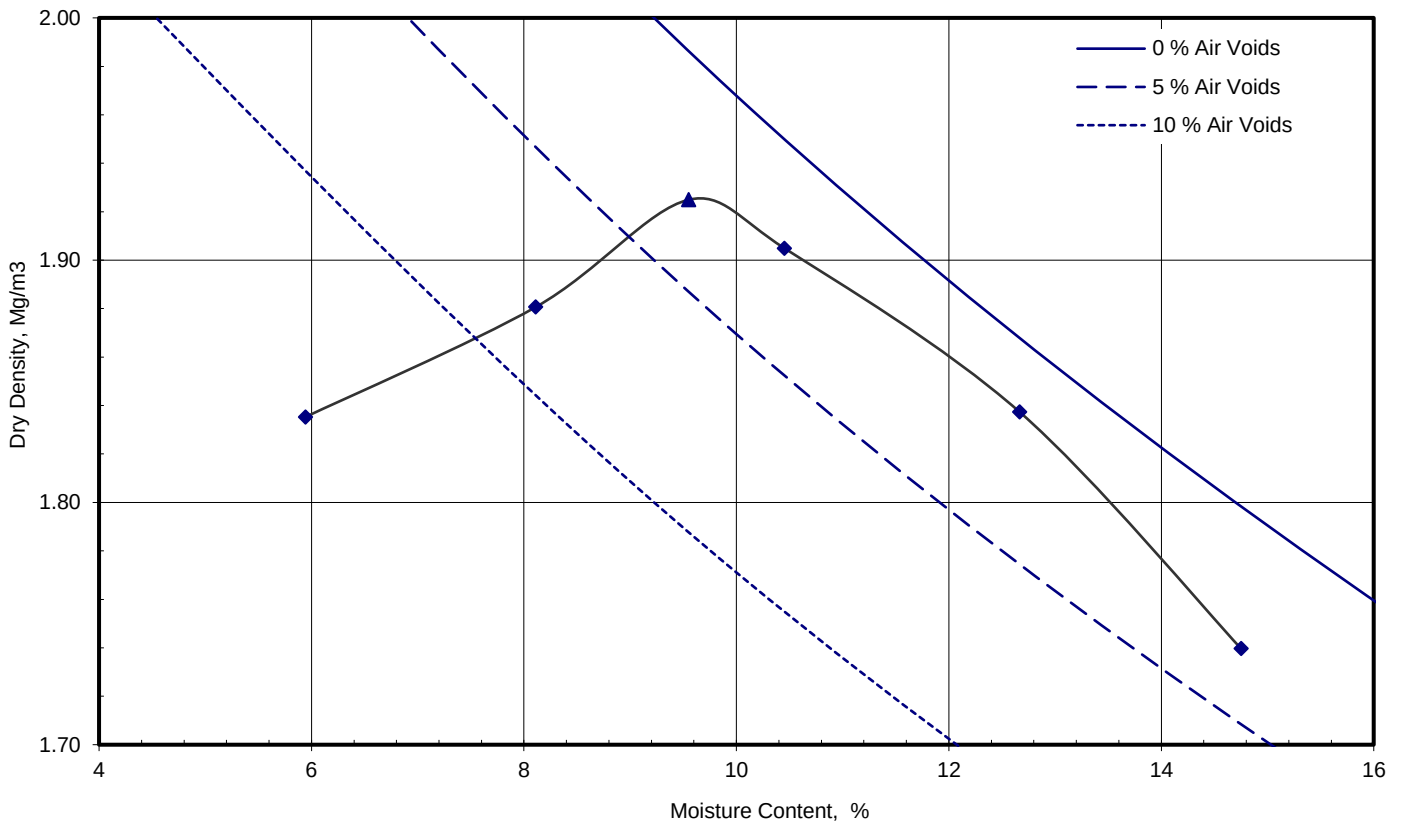
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 14-284
Job Number: 20-31429
Date Sampled: 17/09/2020
Date Received: 21/09/2020
Date Tested: 30/09/2020
Sampled By: Client - A. Allcock

Test Results:

Laboratory Reference: 1627648
Hole No.: SW-MG-105
Sample Reference: Not Given
Sample Description: Dark brown sandy GRAVEL with fragments of brick, glass, slag, crushed concrete (MADE GROUND)

Depth Top [m]: Not Given
Depth Base [m]: Not Given
Sample Type: B



Preparation		Material used was natural
Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	8
Material Retained on 20.0 mm Sieve	%	28
Particle Density - Assumed	Mg/m³	2.45
As received Moisture Content	%	13
Maximum Dry Density	Mg/m³	1.92
Optimum Moisture Content	%	9.6

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.6 using 4.5kg [heavy] Rammer

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

Summary of Moisture Condition Value Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-4: 1990: Clause 5.4

Client: E3P
Client Address: Taylor Road, Urmston,
Manchester, M41 7JQ

Contact: Andrew Allcock
Site Address: New Victoria

Client Reference: 14-284
Job Number: 20-31429
Date Sampled: 17/09/2020
Date Received: 21/09/2020
Date Tested: 01/10/2020
Sampled By: Client - A. Allcock

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Retained on 20mm sieve %	Moisture Content <20mm %	Moisture Condition Value	Method of Interpretation						
		Reference	Depth Top m	Depth Base m	Type												
1627648	SW-MG-105	Not Given	Not Given	Not Given	B	Dark brown sandy GRAVEL with fragments of brick, glass, slag, crushed concrete (MADE GROUND)		32	14	11.7	Steepest straight line						

Comments:

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Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd



TEST CERTIFICATE

Shear Strength using the Small Shearbox Apparatus

Tested in Accordance with:
BS 1377-7: 1990: Clause 4.5.4

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: E3P
Client Address: Taylor Road, Urmston
Manchester, M41 7JQ

Contact: Andrew Allcock
Site Address: New Victoria

Client Reference: 14-284
Job Number: 20-31429
Date Sampled: 17/09/2020
Date Received: 21/09/2020
Date Tested: 07/10/2020
Sampled By: Client - A. Allcock

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1627648
Hole No.: SW-MG-105
Sample Reference: Not Given
Sample Description: Dark brown sandy GRAVEL with fragments of brick, glass, slag, crushed concrete (MADE GROUND)

Depth Top [m]: Not Given
Depth Base [m]: Not Given
Sample Type: B

Preparation Details

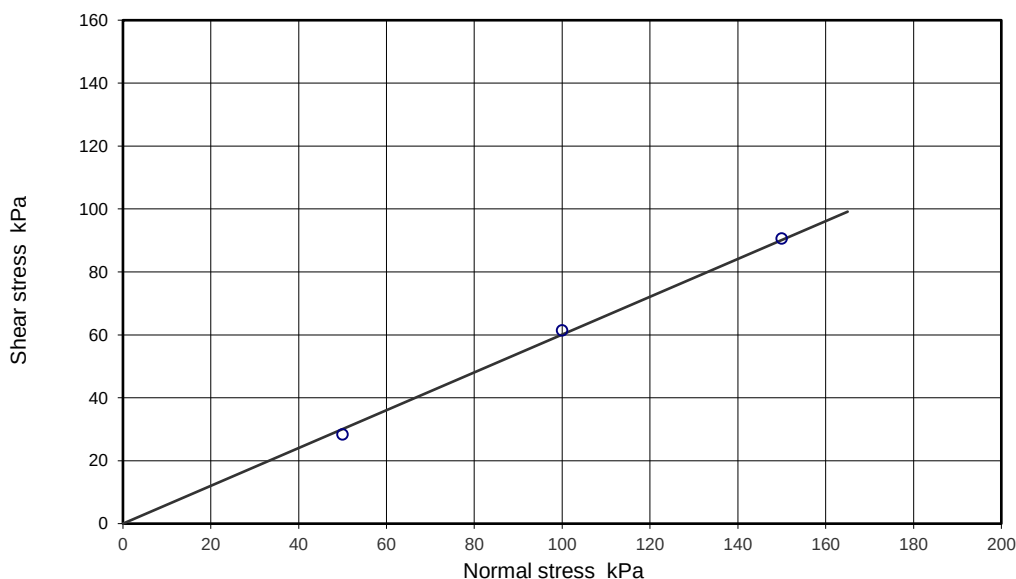
Specimen Details

Test No.

		1	2	3			
Initial	Height	20.1	20.1	20.1			mm
	Length	60.0	60.0	60.0			mm
	Breadth	60.0	60.0	60.0			mm
	Particle Density - (assumed)	2.65	2.65	2.65			Mg/m ³
	Bulk Density	1.70	1.70	1.70			Mg/m ³
	Moisture Content	17.4	17.4	17.4			%
	Dry density	1.45	1.45	1.45			Mg/m ³
	Voids ratio	0.828	0.828	0.828			
	Degree of Saturation	56	56	56			%
Consolidation	Consolidation / Normal Stress applied	50	100	150			kPa
	Change in height during consolidation	0.420	0.640	0.830			mm
	Voids ratio after consolidation	0.790	0.770	0.753			
After test	Final Moisture content	25.2	25.0	24.9			%

Shearing stage(s)

Rate of displacement	Peak	1.00000	1.00000	1.00000			mm/min
	Residual						mm/min
Peak values, (o)	Relative horizontal displacement	2.35	5.83	9.25			mm
	Shear stress	28.3	61.4	90.6			kPa
	Vertical Movement at peak shear stress	0.32	0.44	0.95			mm
Residual values, (x)	No. of traverses (including peak run)	1	1	1			
	Relative horizontal displacement						mm
	Shear stress						kPa
	Vertical movement at residual shear stress						mm



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	[-2.2]	0.00
Ø'	degrees	[32.0]	31.0

Residual strength, (x)

c'R	kPa	not assessed	-
Ø'R	degrees	not assessed	-

Remarks: Test carried out on material passing 2 mm.

Signed:

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Monika Janoszek

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd



TEST CERTIFICATE

Shear Strength using the Small Shearbox Apparatus

Tested in Accordance with:
BS 1377-7: 1990: Clause 4.5.4

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: E3P
Client Address: Taylor Road, Urmston
Manchester, M41 7JQ

Contact: Andrew Allcock
Site Address: New Victoria

Client Reference: 14-284
Job Number: 20-31429
Date Sampled: 17/09/2020
Date Received: 21/09/2020
Date Tested: 07/10/2020
Sampled By: Client - A. Allcock

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1627648

Hole No.: SW-MG-105

Sample Reference: Not Given

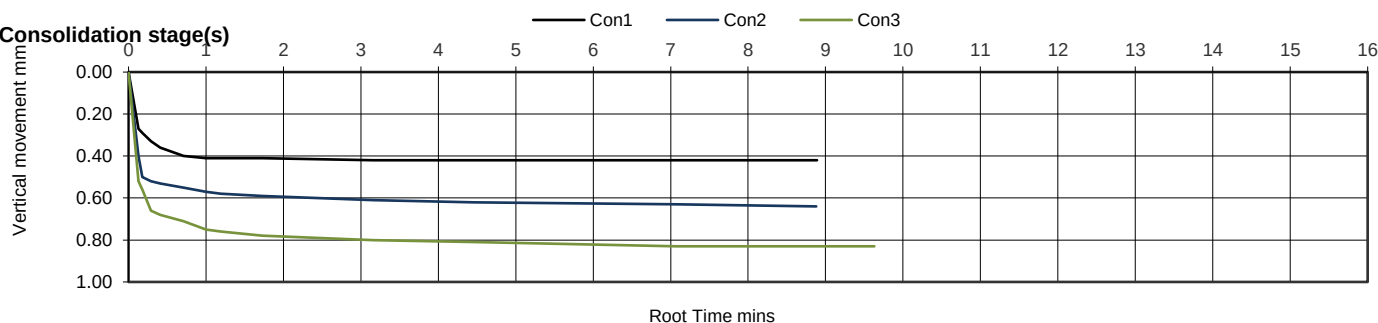
Sample Description: Dark brown sandy GRAVEL with fragments of brick, glass, slag, crushed concrete (MADE GROUND)

Depth Top [m]: Not Given

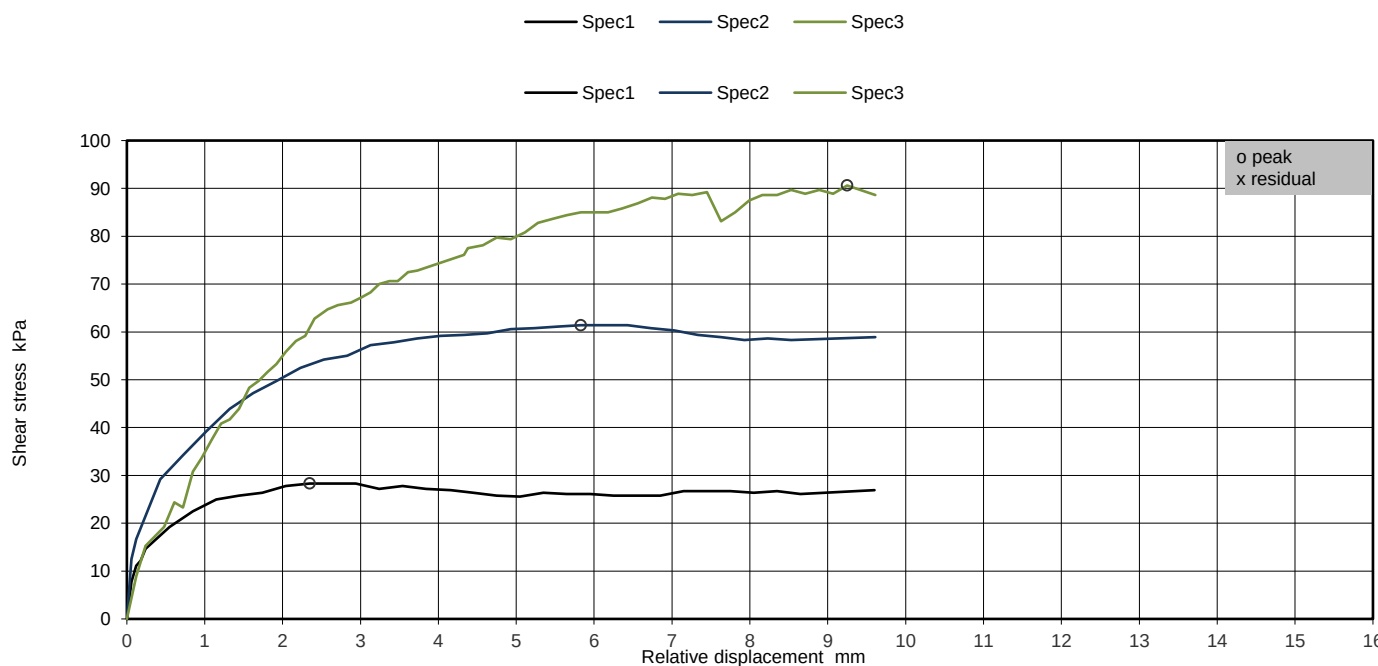
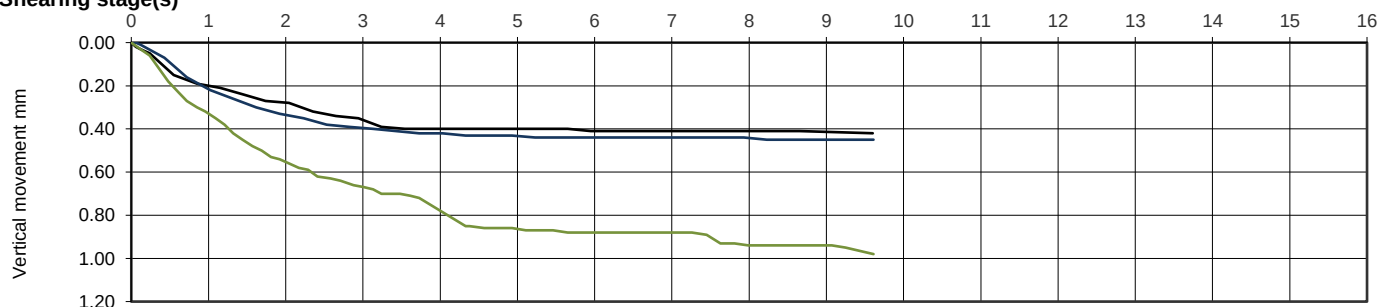
Depth Base [m]: Not Given

Sample Type: B

Consolidation stage(s)



Shearing stage(s)



Remarks: Test carried out on material passing 2 mm.

Signed:

Monika Janoszek

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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i2 Environmental Science
 7 Woodshots Meadow
 Croxley Green Business Park
 Watford
 WD18 8YS

Page 1 of 1

For the attention of Darren Berrill

Report No: **C7237**
 Issue No **01**

LABORATORY TEST REPORT

Project Name	NEW VICTORIA		
Project Number	C7237	Date samples received	19/10/2020
Your Ref	20-35456	Date written instructions received	19/10/2020
Purchase Order	PO_S_0858_20-35456	Date testing commenced	25/10/2020
Please find enclosed the results as summarised below			
Item No	Test Quantity	Description	ISO 17025 Accredited
7.18	2	Set of 3 x 300mm shear box	Yes
Remarks :			
Issued by : J Hopkins		Date of Issue : 27/11/2020	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  27/11/2020		J.Hopkins (Laboratory Coordinator), M D Brown (Senior Quality Manager), R Norris (Supervisor)	
Unless we are notified to the contrary, samples will be disposed after a period of one month from this date. The results reported relate to samples received in the laboratory only. All results contained in this report are provisional unless signed by an approved signatory This report should not be reproduced except in full without the written approval of the laboratory. Under multisite accreditation the testing contained in this report may have been performed at another Terra Tek laboratory. Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation. Feedback on the this report may be left via our website terratek.co.uk/feedback			



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Terra Tek Ltd is registered in Scotland No. 121594
 Offices in Airdrie, Birmingham, Belfast and Aston Clinton

Head Office : 62 Rochsolloch Road, Airdrie, ML6 9BG

 TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site NEW VICTORIA		Contract No. 20-35456	
		Client i2 Environmental Science		Hole ID SW-MG-117	
		Engineer		Sample 10/02/2020	

Specimen Details

Depth within original sample n/a
Orientation within original sample n/a
Test condition Submerged

Description Brown slightly sandy gravelly CLAY. Gravel is fine to coarse with occasional construction debris.

Preparation Material >20mm removed (81% passing). Remoulded using 4.5 Kg compactive effort at the as-received moisture content.

Specimen Number		1	2	3
Length	mm	307.0	307.0	307.0
Width	mm	306.6	306.6	306.6
Height	mm	150.0	150.0	150.0
Initial moisture content	%	18.4	18.4	18.4
Initial bulk density	Mg/m ³	2.05	2.05	2.05
Initial dry density	Mg/m ³	1.73	1.73	1.73
Particle Density (assumed)	Mg/m ³	2.65	2.65	2.65

Consolidation Stage

Normal stress	kPa	50	100	150
Height change	mm	-4.7	-5.9	-5.4
Duration	day(s)	1	1	1

Shearing Stage

Normal stress	kPa	50	100	150
---------------	-----	----	-----	-----

Peak Conditions:

Rate of horizontal displacement	mm/min	0.0305	0.0305	0.0305
Maximum shear stress	kPa	54	100	132
Horizontal displacement	mm	15.7	17.0	20.1
Height change	mm	0.2	-0.2	-0.8

Residual Conditions:

Rate of horizontal displacement	mm/min	n/a	n/a	n/a
Residual shear stress	kPa	n/a	n/a	n/a
Final cumulative displacement	mm	n/a	n/a	n/a
Total traverses	No.	n/a	n/a	n/a
Method of reversal		n/a	n/a	n/a
Final moisture content	%	18.1	17.9	16.2
Duration	day(s)	1	1	1

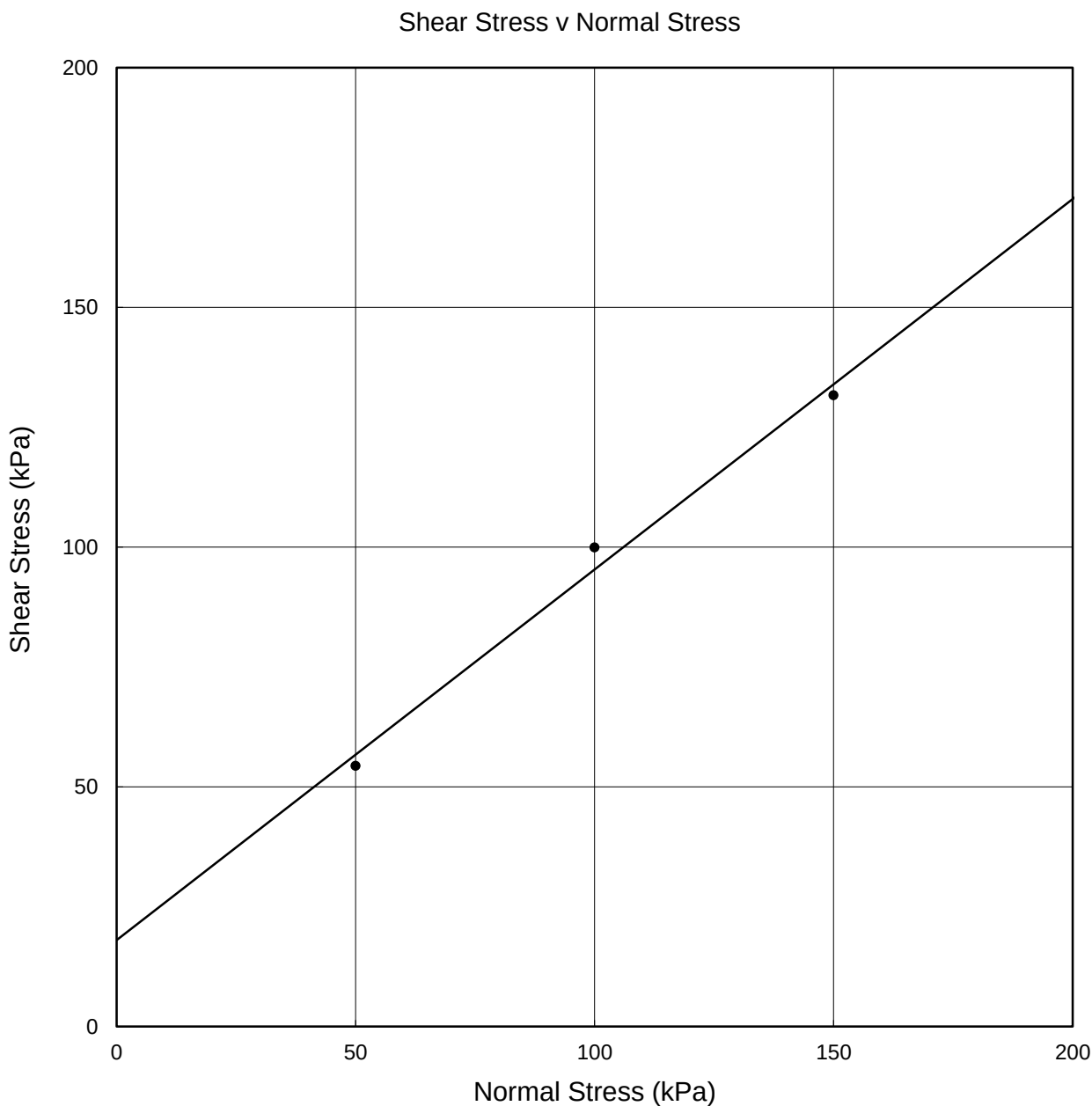
Shear Strength Parameters

Maximum Condition: (linear tangent interpretation)

Effective Cohesion	kPa	18
Effective Angle of Shearing Resistance	degrees	37.5

Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox) BS1377:Part 7:1990 Clause 5	
VB	27/11/2020		

Site	NEW VICTORIA	Contract No.	20-35456
Client	i2 Environmental Science	Hole ID	SW-MG-117
Engineer		Sample	10/02/2020



Shear Strength Parameters (linear tangent interpretation)

$$c' = 18 \text{ kPa}$$

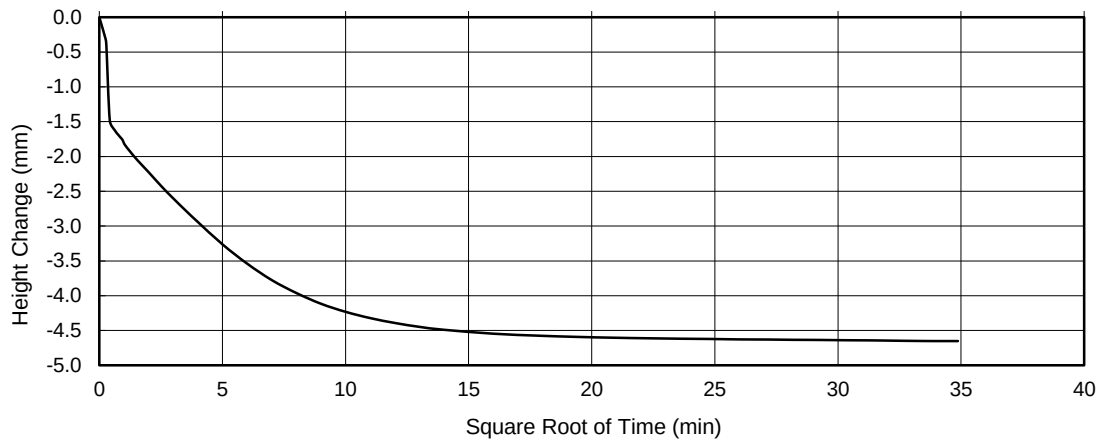
$$\phi' = 37.5^\circ$$

Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox)	
VB	27/11/2020		
BS1377:Part 7:1990 Clause 5			
Sheet 2 of 5			

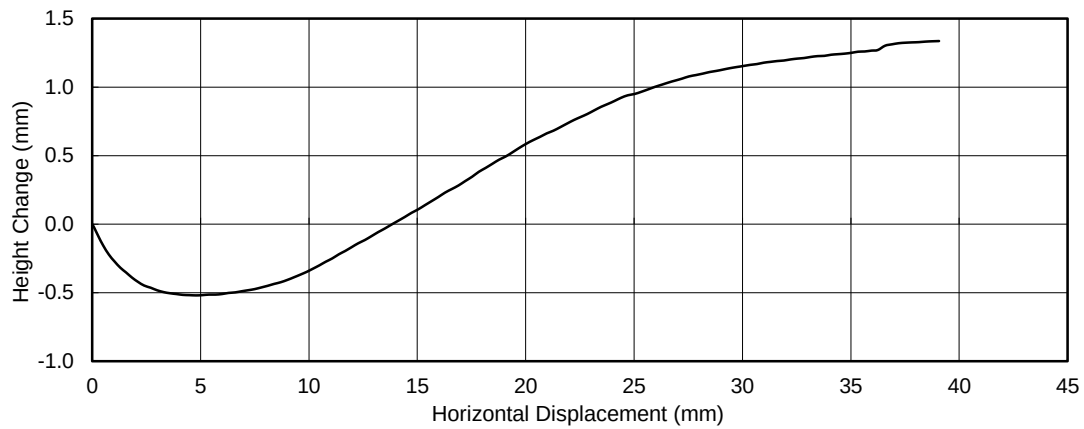
Specimen No. 1

Normal Pressure = 50 kPa

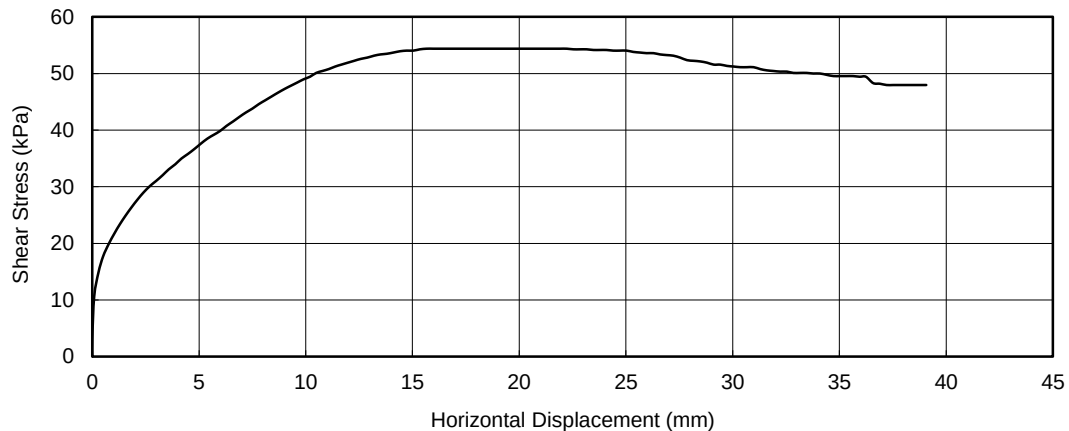
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



Originator

Checked &
Approved

Shear Strength by Direct Shear (large shearbox)

VB

27/11/2020

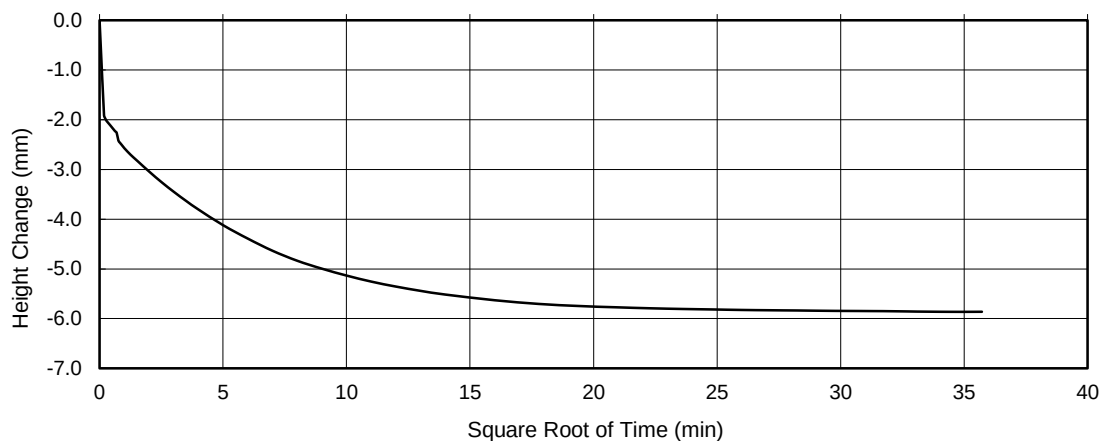
BS1377:Part 7:1990 Clause 5



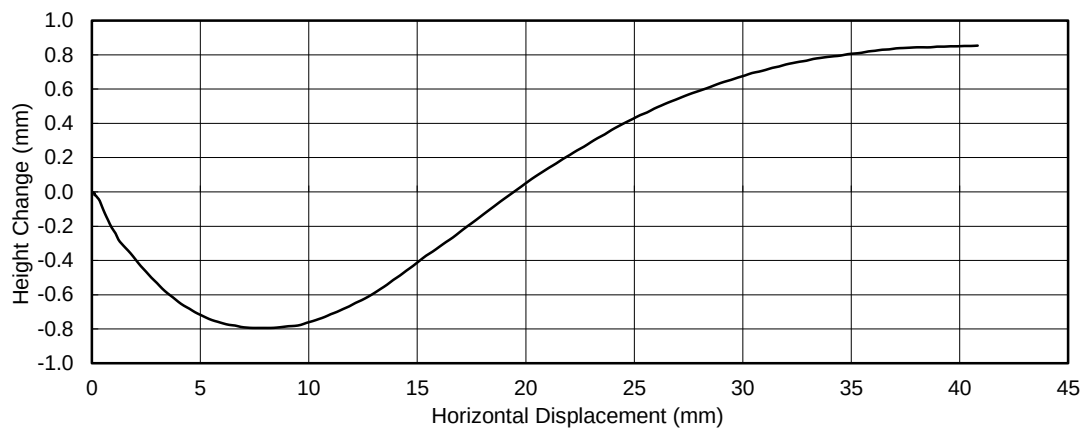
Specimen No. 2

Normal Pressure = 100 kPa

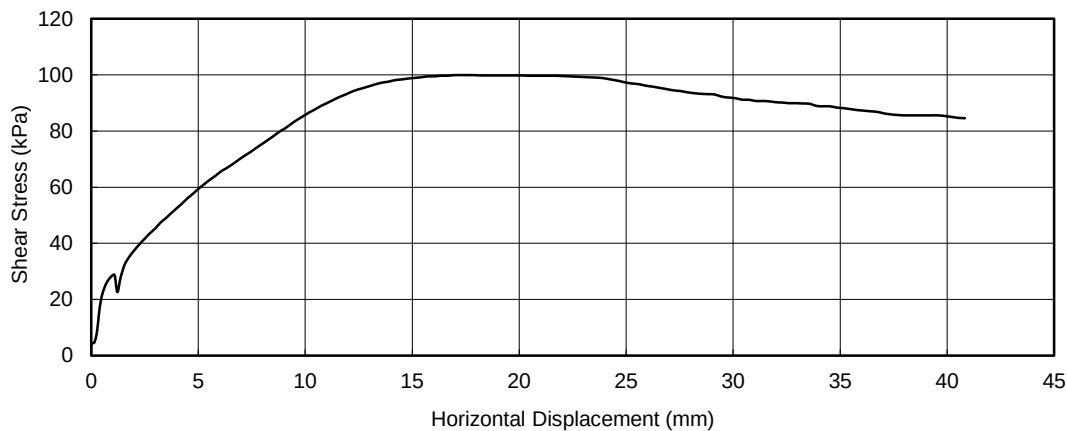
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



Originator

Checked &
Approved

Shear Strength by Direct Shear (large shearbox)

VB

27/11/2020

BS1377:Part 7:1990 Clause 5

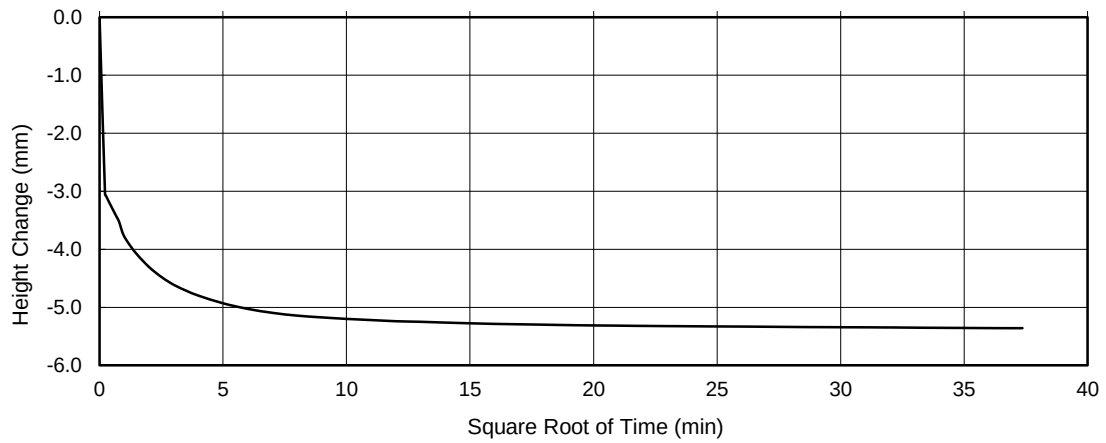


Sheet 4 of 5

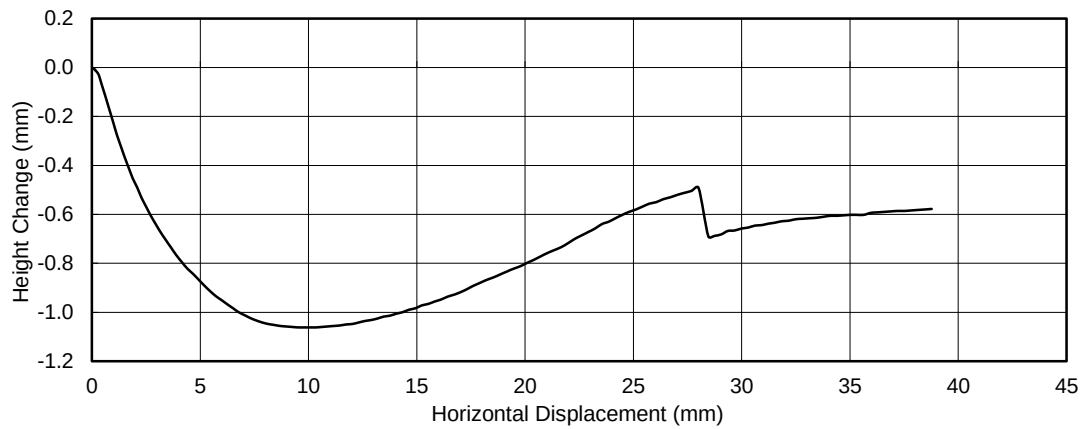
Specimen No. 3

Normal Pressure = 150 kPa

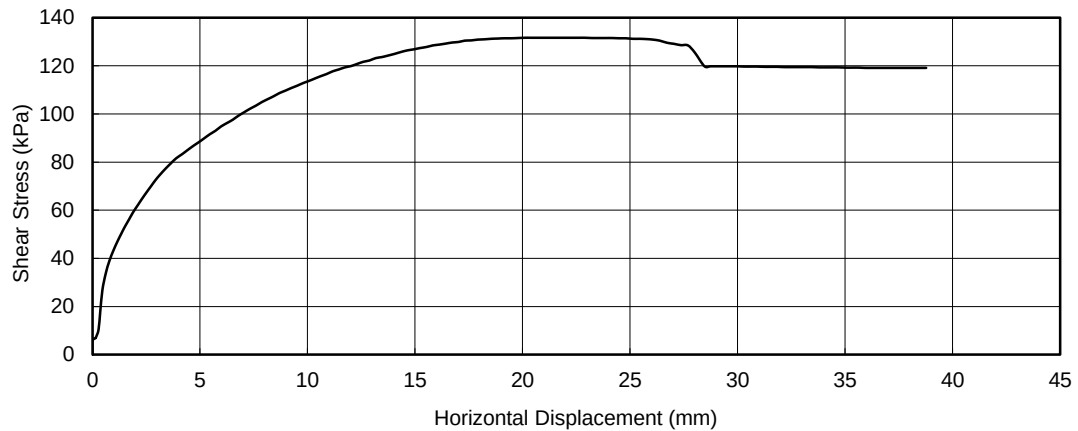
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



 TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site NEW VICTORIA		Contract No. 20-35456	
		Client i2 Environmental Science		Hole ID SW-MG-118	
		Engineer		Sample 10/02/2020	

Specimen Details

Depth within original sample n/a
Orientation within original sample n/a
Test condition Submerged

Description Brown slightly sandy gravelly CLAY. Gravel is fine to coarse with occasional construction debris.

Preparation Material >20mm removed (78% passing). Remoulded using 4.5 Kg compactive effort at the as-received moisture content.

Specimen Number		1	2	3
Length	mm	300.4	300.4	300.4
Width	mm	300.5	300.5	300.5
Height	mm	150.0	150.0	150.0
Initial moisture content	%	19.4	19.4	19.4
Initial bulk density	Mg/m ³	1.99	1.99	1.99
Initial dry density	Mg/m ³	1.67	1.67	1.67
Particle Density (assumed)	Mg/m ³	2.65	2.65	2.65

Consolidation Stage

Normal stress	kPa	50	100	150
Height change	mm	-2.5	-5.2	-5.2
Duration	day(s)	1	1	1

Shearing Stage

Normal stress	kPa	50	100	150
---------------	-----	----	-----	-----

Peak Conditions:

Rate of horizontal displacement	mm/min	0.035	0.035	0.035
Maximum shear stress	kPa	58	107	145
Horizontal displacement	mm	13.5	12.6	11.2
Height change	mm	1.0	0.2	-0.1

Residual Conditions:

Rate of horizontal displacement	mm/min	n/a	n/a	n/a
Residual shear stress	kPa	n/a	n/a	n/a
Final cumulative displacement	mm	n/a	n/a	n/a
Total traverses	No.	n/a	n/a	n/a
Method of reversal		n/a	n/a	n/a
Final moisture content	%	17.9	18.1	17.4
Duration	day(s)	1	1	1

Shear Strength Parameters

Maximum Condition: (linear tangent interpretation)

Effective Cohesion	kPa	16
Effective Angle of Shearing Resistance	degrees	41.5

Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox) 
VB	27/11/2020	

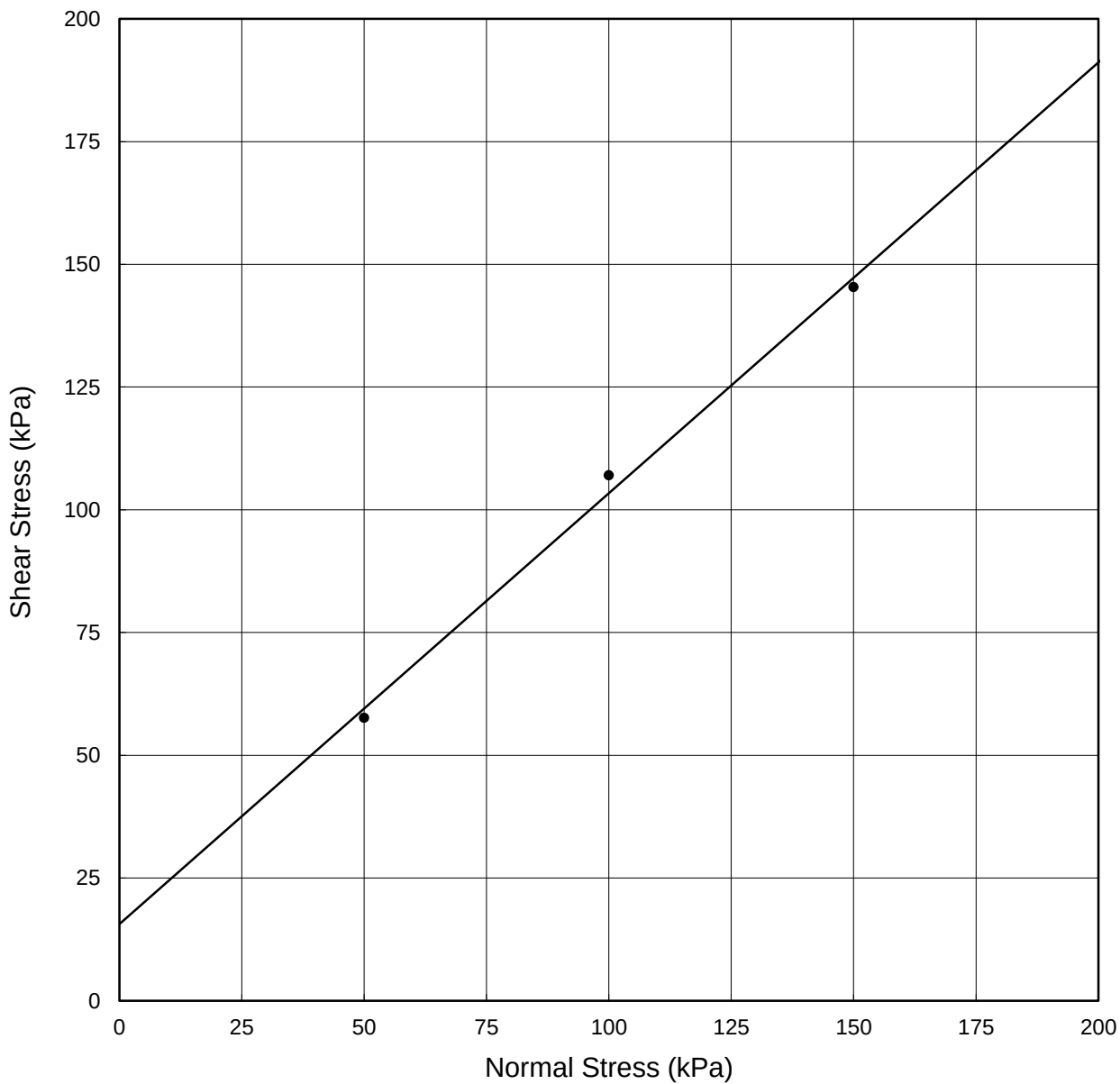
BS1377:Part 7:1990 Clause 5

Sheet 1 of 5

Site	NEW VICTORIA
Client	i2 Environmental Science
Engineer	

Contract No.	20-35456
Hole ID	SW-MG-118
Sample	10/02/2020

Shear Stress v Normal Stress



Shear Strength Parameters (linear tangent interpretation)

$$c' = 16 \text{ kPa}$$

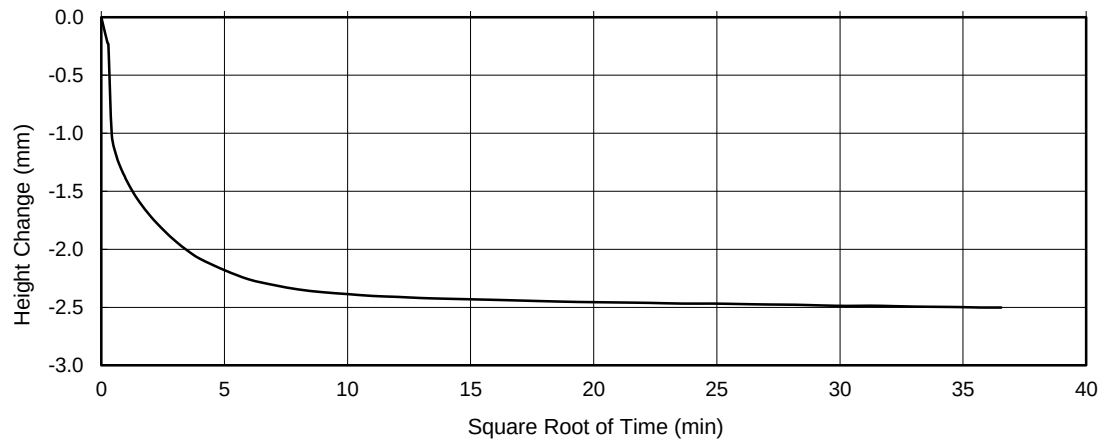
$$\phi' = 41.5^\circ$$

Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox)		
VB	 27/11/2020			BS1377:Part 7:1990 Clause 5
			Sheet 2 of 5	

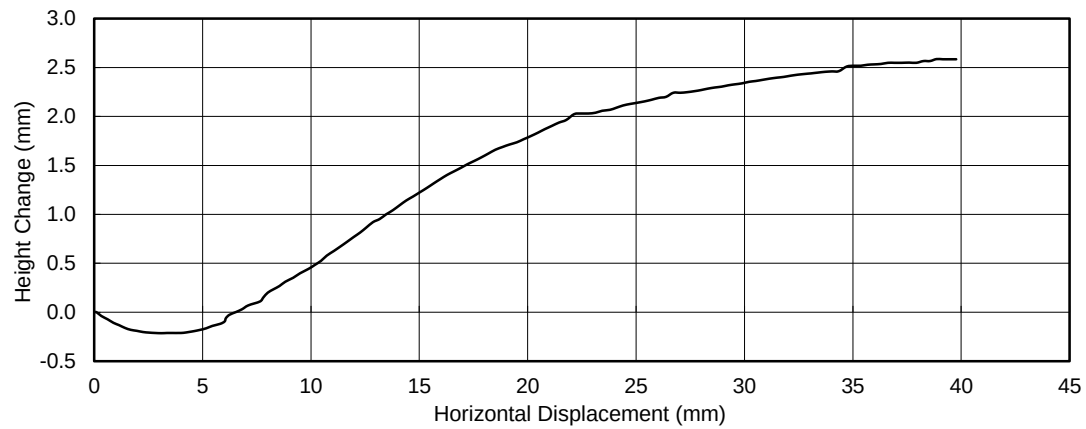
Specimen No. 1

Normal Pressure = 50 kPa

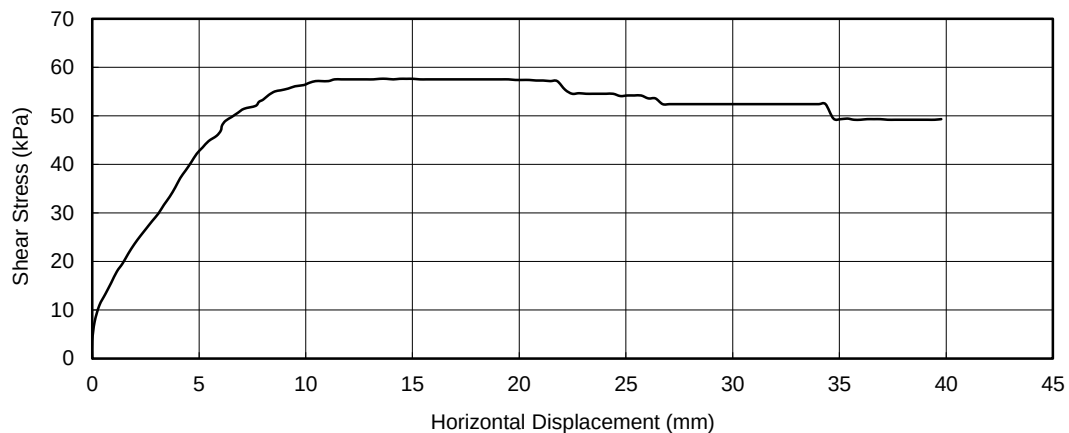
Height Change v Square Root Time



Height Change v Horizontal Displacement



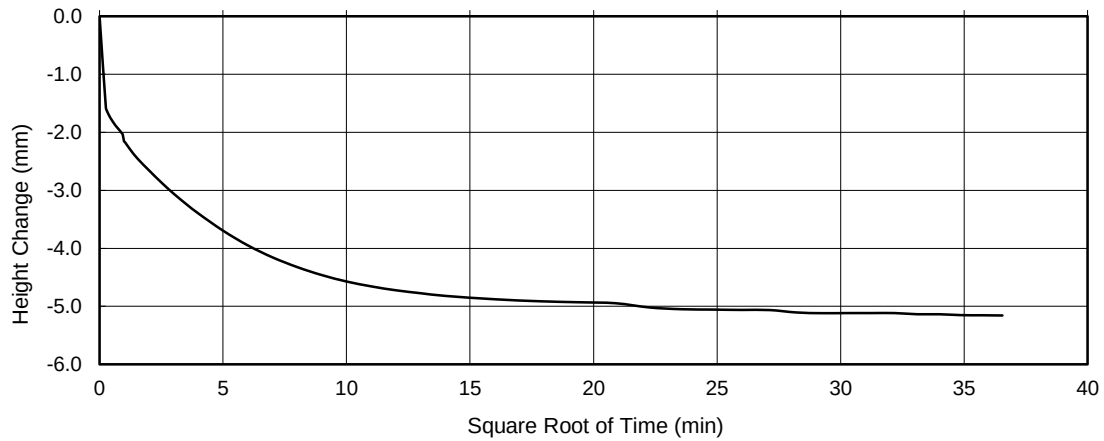
Shear Stress v Horizontal Displacement



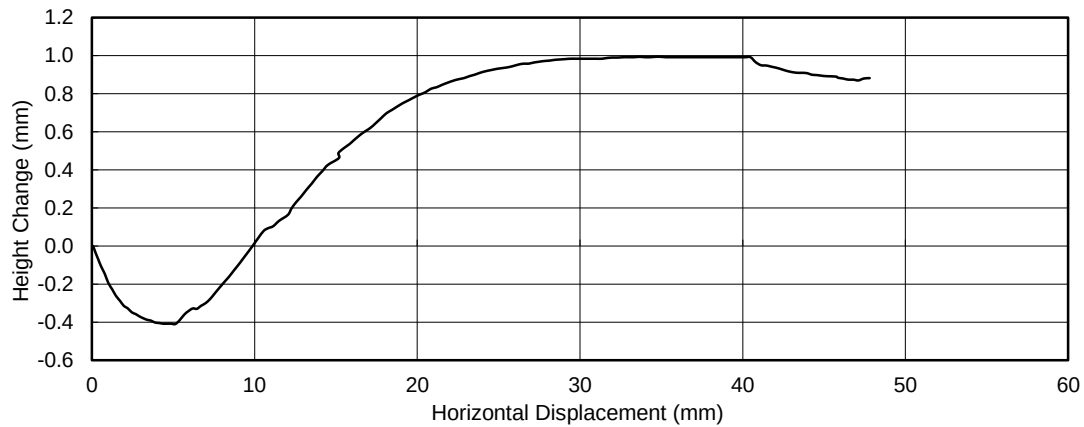
Specimen No. 2

Normal Pressure = 100 kPa

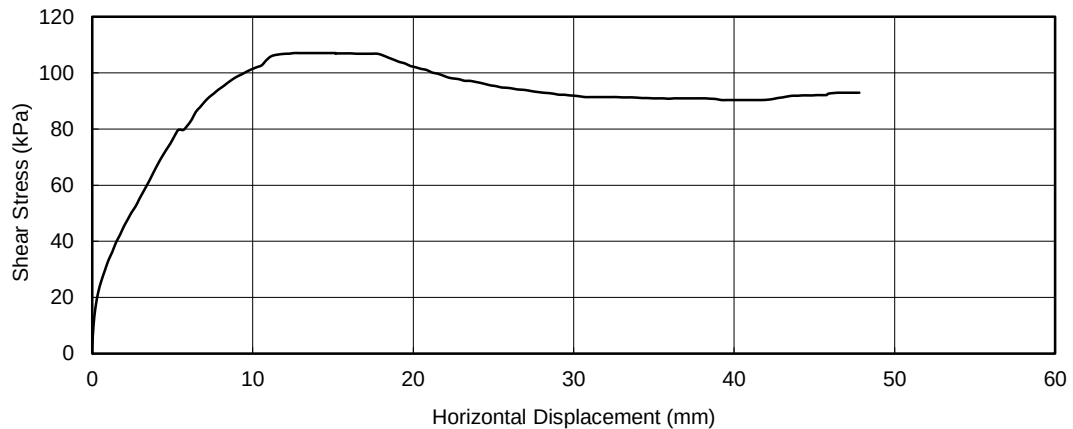
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



Originator

Checked &
Approved

Shear Strength by Direct Shear (large shearbox)

VB

27/11/2020

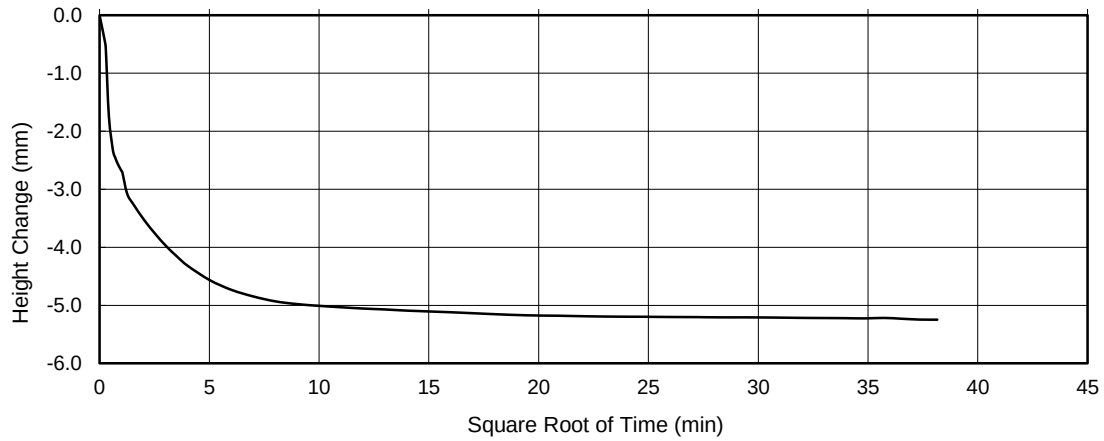
BS1377:Part 7:1990 Clause 5



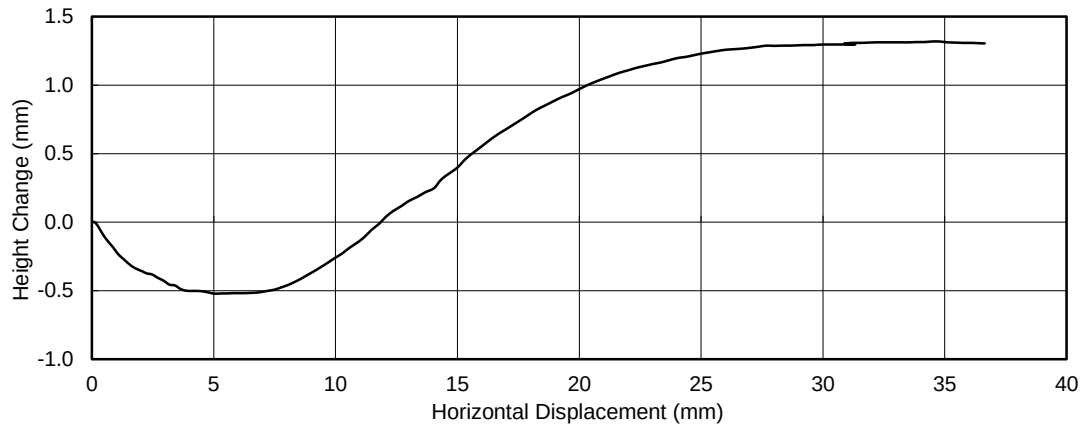
Specimen No. 3

Normal Pressure = 150 kPa

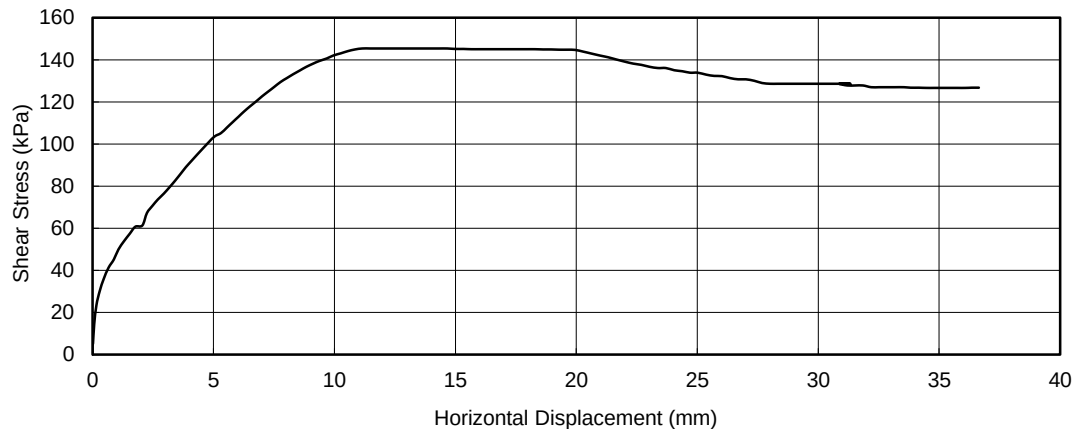
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



i2 Environmental Science
 7 Woodshots Meadow
 Croxley Green Business Park
 Watford
 WD18 8YS

Page 1 of 1

For the attention of Darren Berrill

Report No: **C7237**
 Issue No **02**

LABORATORY TEST REPORT

Project Name	NEW VICTORIA		
Project Number	C7237	Date samples received	19/10/2020
Your Ref	20-35456	Date written instructions received	19/10/2020
Purchase Order	PO_S_0858_20-35456	Date testing commenced	23/11/2020
Please find enclosed the results as summarised below			
Item No	Test Quantity	Description	ISO 17025 Accredited
7.18	1	Set of 3 x 300mm shear box	Yes
Remarks :			
Issued by : J Hopkins		Date of Issue : 04/12/2020	Key to symbols used in this report
		S/C : Testing was sub-contracted	
Approved Signatories : J.Hopkins (Laboratory Coordinator), M D Brown (Senior Quality Manager), R Norris (Supervisor)			
Unless we are notified to the contrary, samples will be disposed after a period of one month from this date. The results reported relate to samples received in the laboratory only. All results contained in this report are provisional unless signed by an approved signatory This report should not be reproduced except in full without the written approval of the laboratory. Under multisite accreditation the testing contained in this report may have been performed at another Terra Tek laboratory. Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation. Feedback on the this report may be left via our website terratek.co.uk/feedback			



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Terra Tek Ltd is registered in Scotland No. 121594
 Offices in Airdrie, Birmingham, Belfast and Aston Clinton

Head Office : 62 Rochsolloch Road, Airdrie, ML6 9BG

 TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site NEW VICTORIA		Contract No. 20-35456	
		Client i2 Environmental Science		Hole ID SW-MG-119 Sample Date 10/02/2020	
		Engineer			

Specimen Details

Depth within original sample n/a
 Orientation within original sample n/a
 Test condition Submerged

Description Brown slightly sandy gravelly CLAY. Gravel is fine to coarse with occasional construction debris.

Preparation Material >20mm removed (82% passing). Remoulded using 4.5 Kg compactive effort at the as-received moisture content.

Specimen Number		1	2	3
Length	mm	307.0	307.0	307.0
Width	mm	306.6	306.6	306.6
Height	mm	150.0	150.0	150.0
Initial moisture content	%	19.7	19.7	19.7
Initial bulk density	Mg/m ³	2.00	2.00	2.00
Initial dry density	Mg/m ³	1.67	1.67	1.67
Particle Density (assumed)	Mg/m ³	2.65	2.65	2.65

Consolidation Stage

Normal stress	kPa	50	100	150
Height change	mm	-5.5	-6.6	-6.7
Duration	day(s)	1	1	1

Shearing Stage

Normal stress	kPa	50	100	150
---------------	-----	----	-----	-----

Peak Conditions:

Rate of horizontal displacement	mm/min	0.0305	0.0305	0.0305
Maximum shear stress	kPa	57	99	128
Horizontal displacement	mm	15.0	14.0	10.9
Height change	mm	0.2	-0.1	0.2

Residual Conditions:

Rate of horizontal displacement	mm/min	n/a	n/a	n/a
Residual shear stress	kPa	n/a	n/a	n/a
Final cumulative displacement	mm	n/a	n/a	n/a
Total traverses	No.	n/a	n/a	n/a
Method of reversal		n/a	n/a	n/a
Final moisture content	%	18.9	18.6	18.0
Duration	day(s)	1	1	1

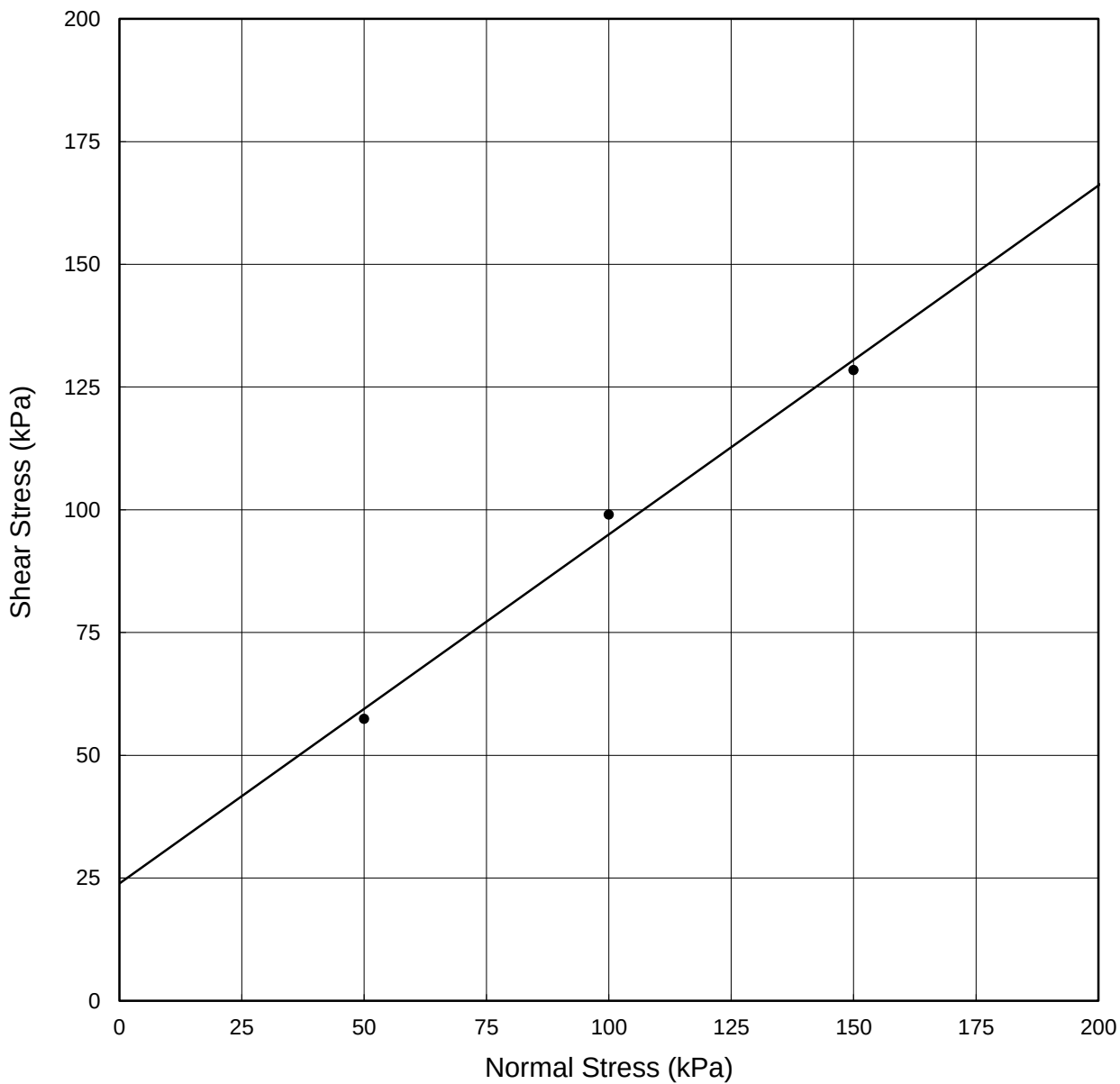
Shear Strength Parameters

Maximum Condition: (linear tangent interpretation)

Effective Cohesion	kPa	24
Effective Angle of Shearing Resistance	degrees	35.5

Originator	Checked & Approved	Shear Strength by Direct Shear (large shearbox) BS1377:Part 7:1990 Clause 5	
RC	04/12/2020		

Shear Stress v Normal Stress



Shear Strength Parameters (linear tangent interpretation)

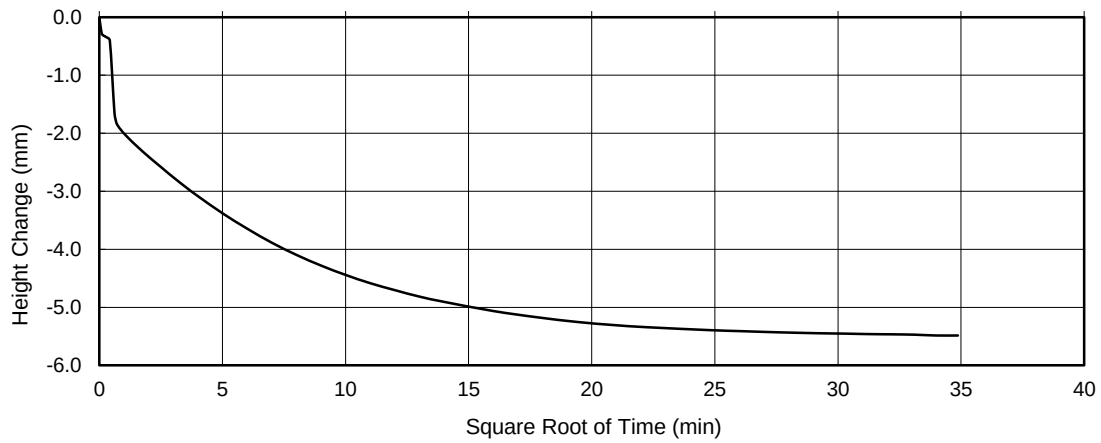
$$c' = 24 \text{ kPa}$$

$$\phi' = 35.5^\circ$$

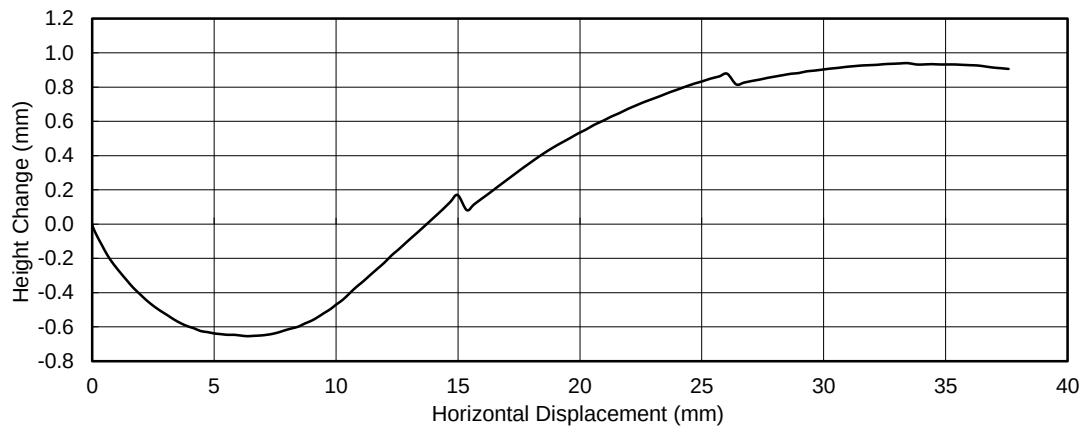
Specimen No. 1

Normal Pressure = 50 kPa

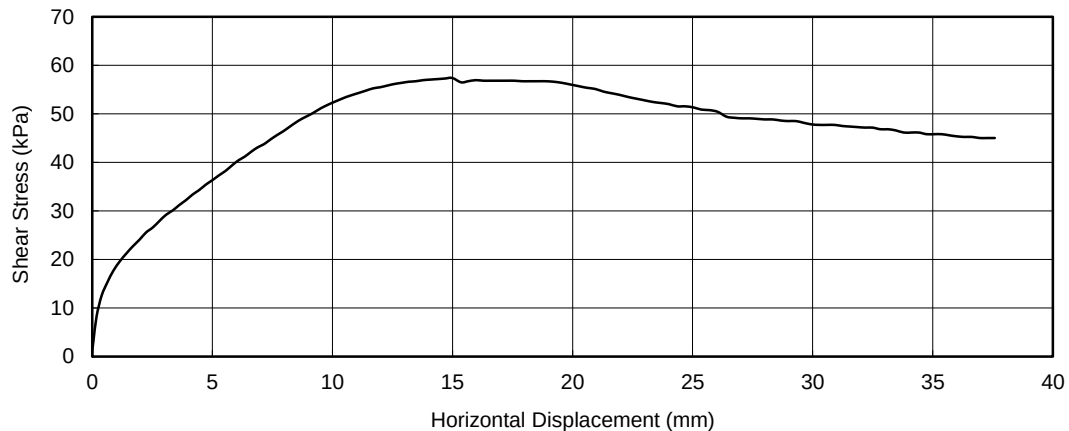
Height Change v Square Root Time



Height Change v Horizontal Displacement



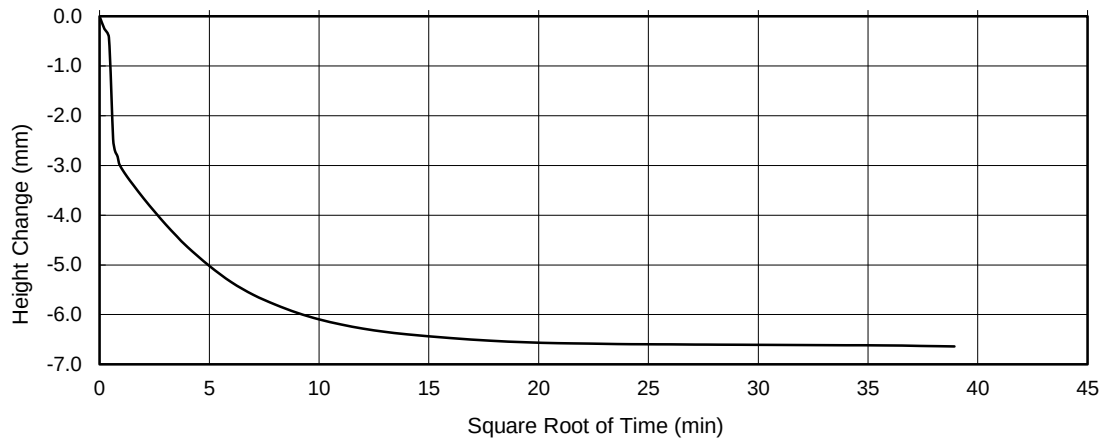
Shear Stress v Horizontal Displacement



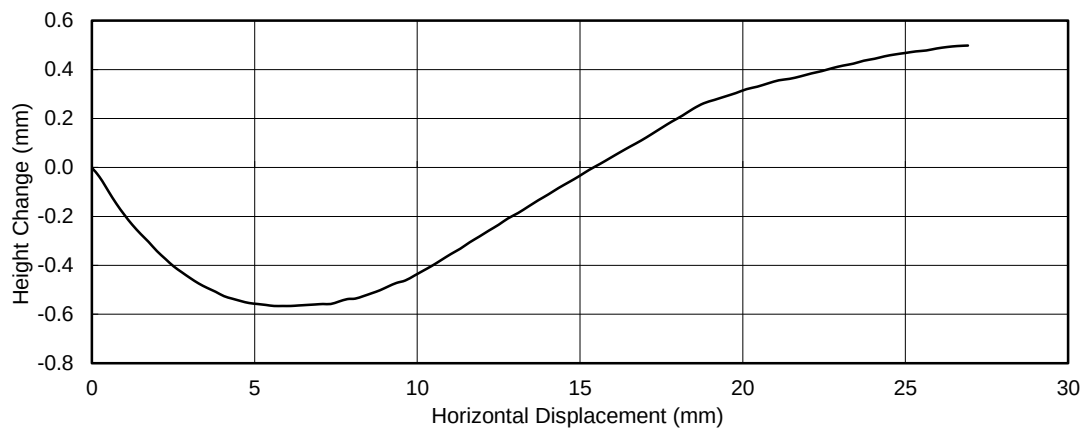
Specimen No. 2

Normal Pressure = 100 kPa

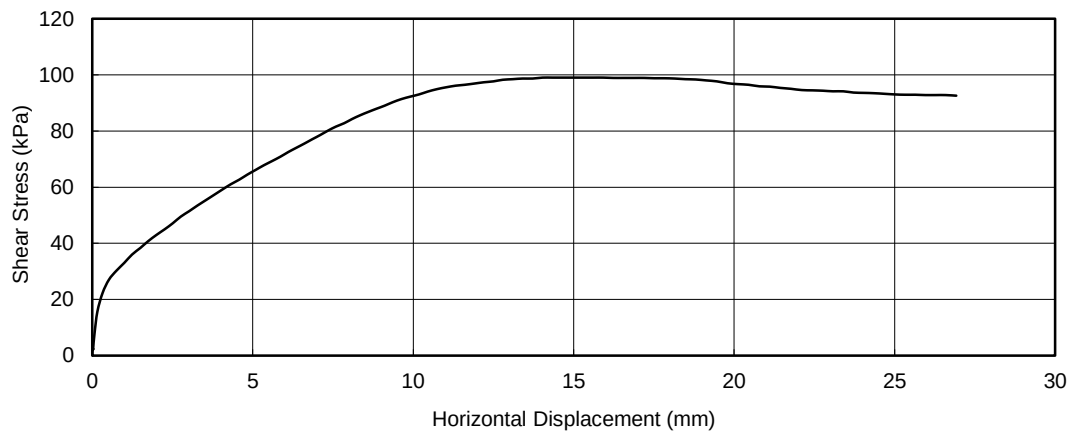
Height Change v Square Root Time



Height Change v Horizontal Displacement



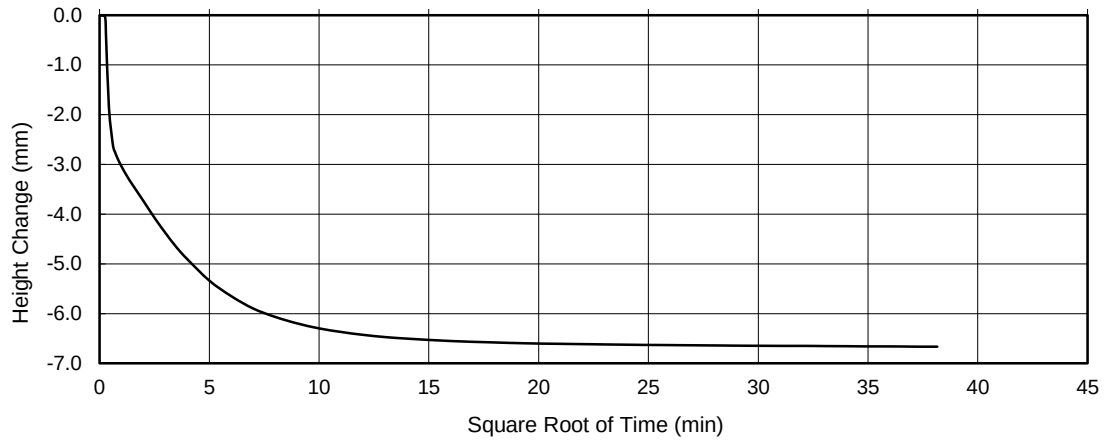
Shear Stress v Horizontal Displacement



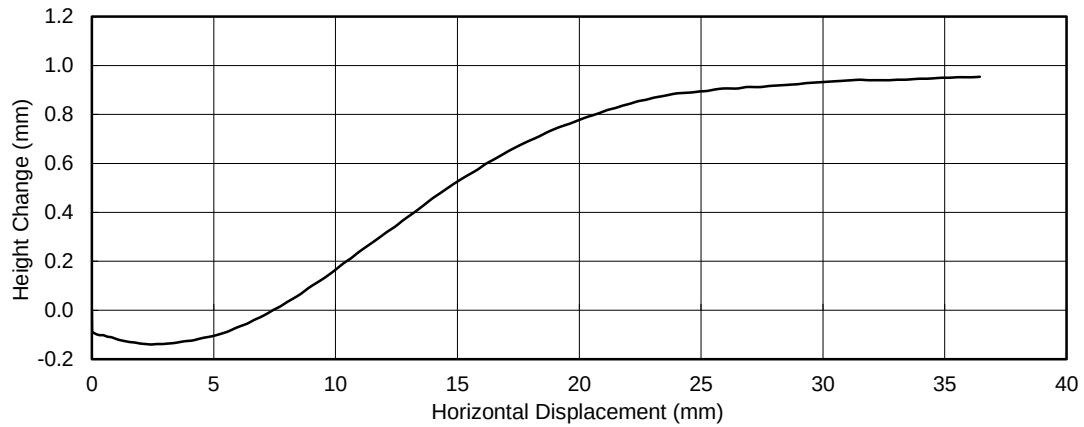
Specimen No. 3

Normal Pressure = 150 kPa

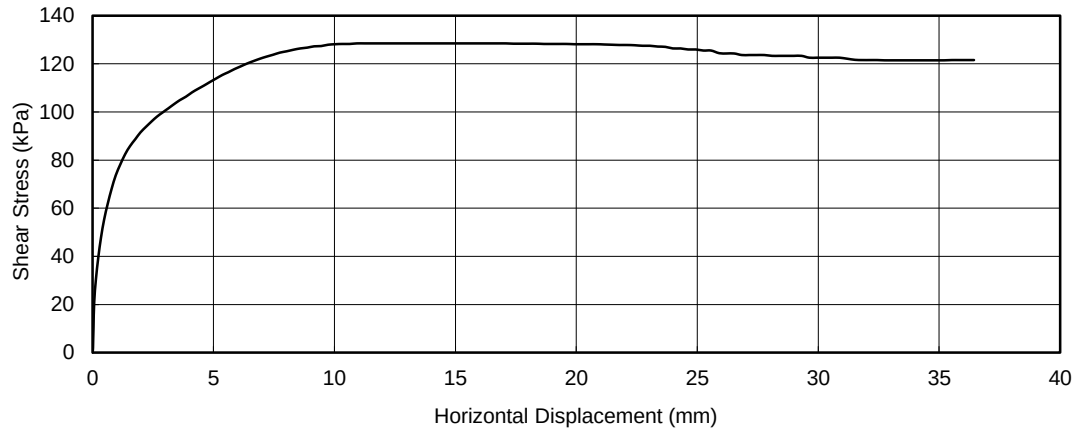
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



Originator

Checked & Approved

Shear Strength by Direct Shear (large shearbox)

RC

04/12/2020

BS1377:Part 7:1990 Clause 5





LABORATORY REPORT



4043

Contract Number: PSL20/5386

Report Date: 13 October 2020
Client's Reference: 14284-AA-D
Client Name: E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

For the attention of: Andrew Allcock

Contract Title: New Victoria

Date Received: 1/10/2020
Date Commenced: 1/10/2020
Date Completed: 13/10/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

L Knight
(Senior Technician)

A Watkins
(Director)

S Eyre
(Senior Technician)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)

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Doncaster DN4 0AR
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fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

4043

PSL
Professional Soils Laboratory

New Victoria

Contract No:

PSL20/5386

Client Ref:

14284-AA-D

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



4043

PSL
Professional Soils Laboratory

New Victoria

Contract No:

PSL20/5386

Client Ref:

14284-AA-D

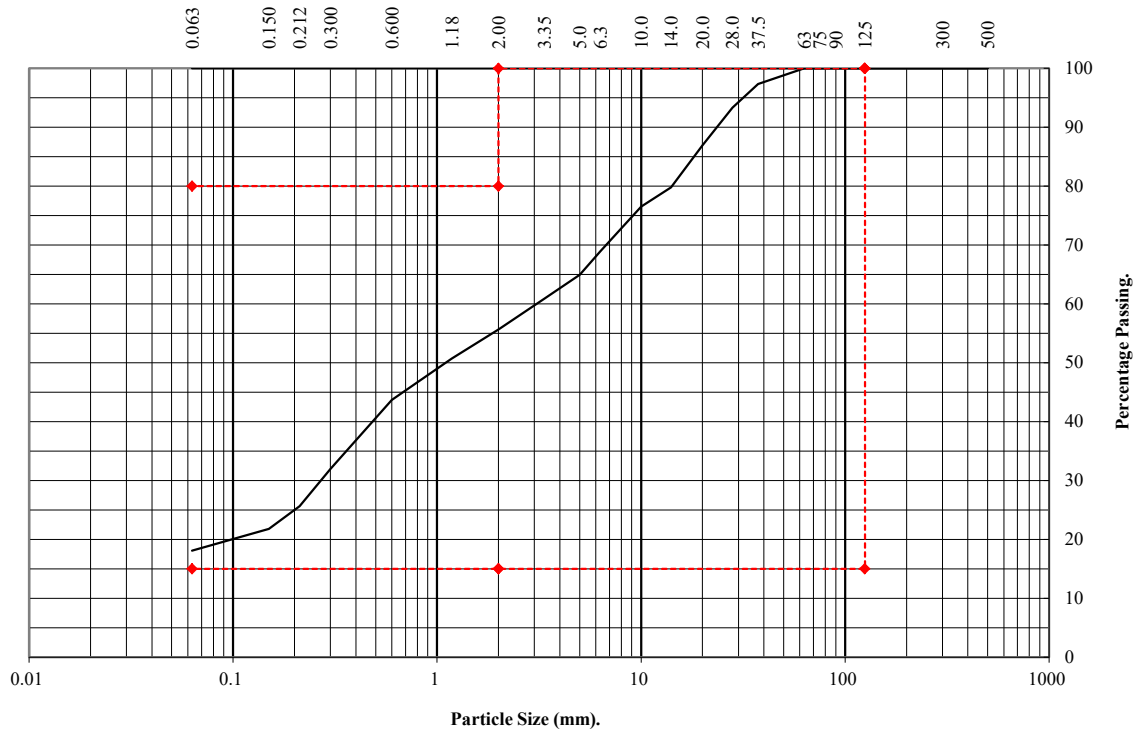
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: Sw-MG 111 Classification Type: 2C



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100	100	100
300	100		
125	100		
90	100		
75	100		
63	100		
37.5	97		
28	93		
20	87		
14	80		
10	77	15	80
6.3	69		
5	65		
3.35	61		
2	56		
1.18	51		
0.6	44		
0.3	32		
0.212	26		
0.15	22		
0.063	18	15	80

Remarks:
SHW Series 600 Table 6/2 :
Class 2C



New Victoria

Contract No.:

PSL20/5386

Client Ref:

14284-AA-D

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.6 : 1990

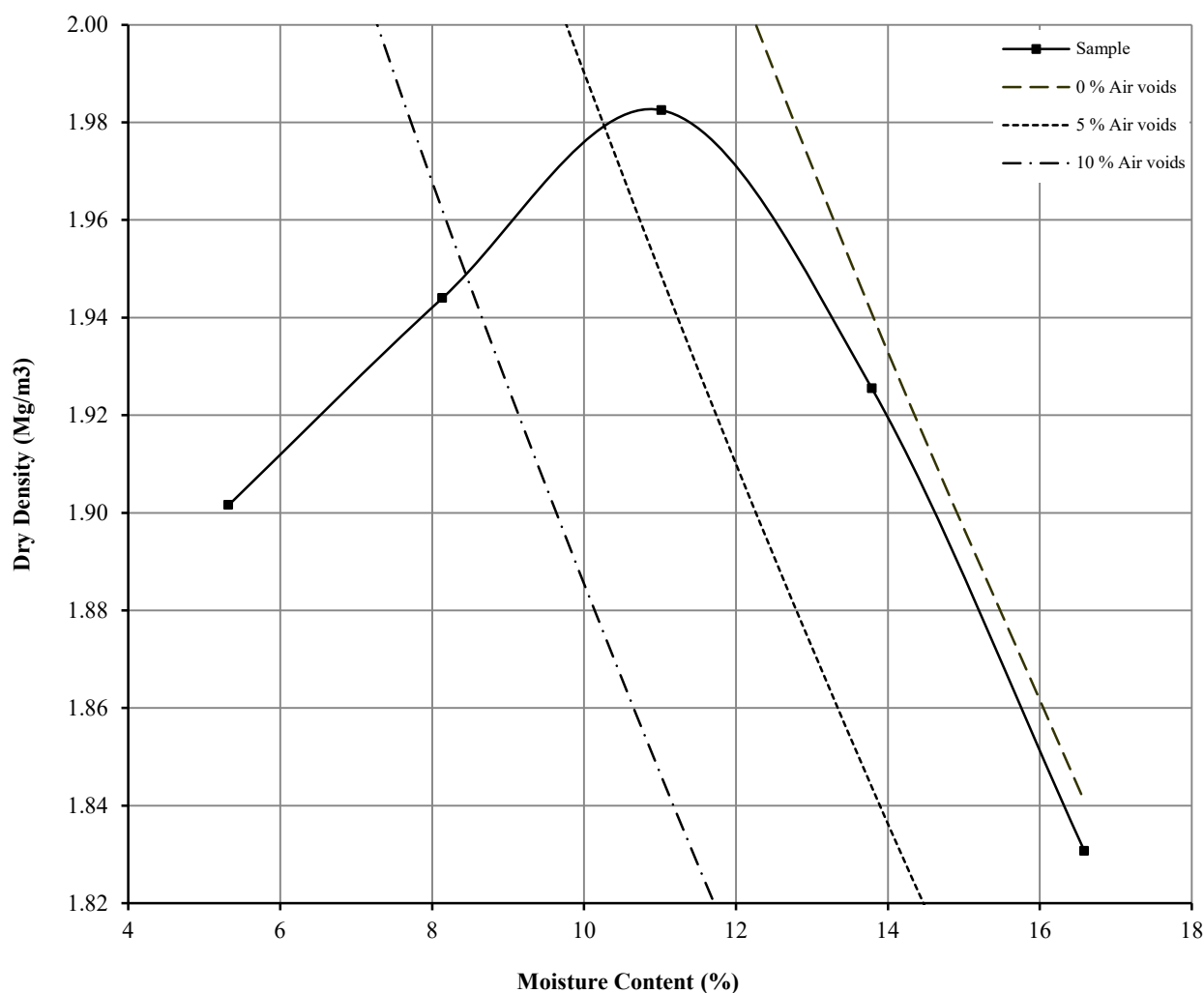
Hole Number: Sw-MG 111

Top Depth (m) :

Sample Number:

Base Depth (m) :

Sample Type: Bulk



Initial Moisture Content:	17	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):	3
Maximum Dry Density (Mg/m ³):	1.98		Material Retained on 20.0 mm Test Sieve (%):	10
Optimum Moisture Content (%):	11			
Remarks				
See summary of soil descriptions.				



New Victoria

Contract
PSL20/5386
Client Ref
14284-AA-D

MOISTURE CONDITION VALUE

BS1377 : Part 4 : 1990 Clause 5.4

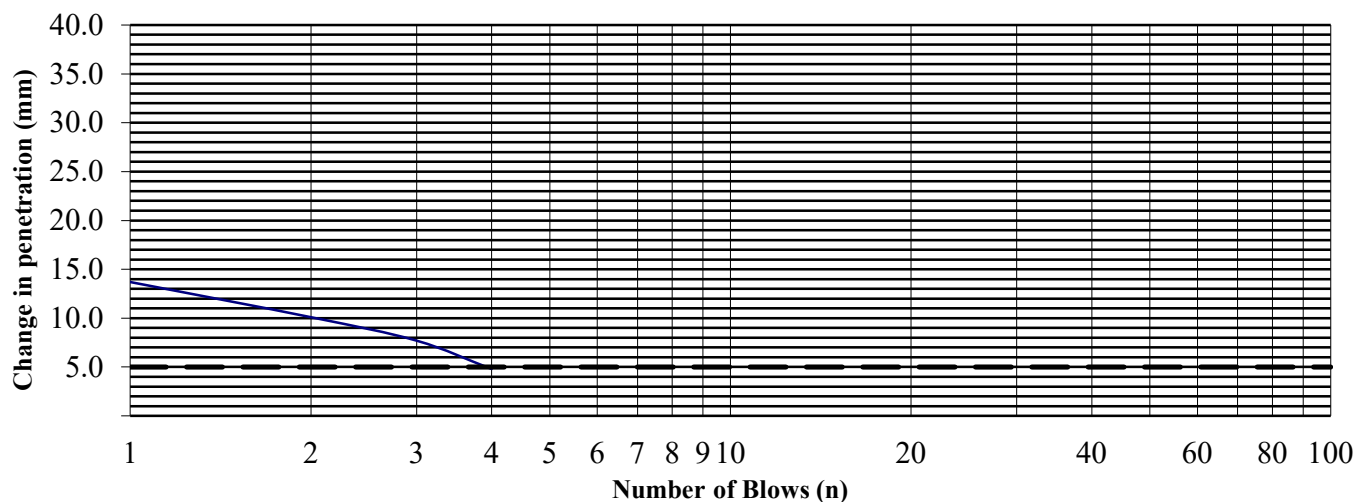
Hole Number: Sw-MG 111 Top Depth (m):

Sample Number: Base Depth (m):

Sample Type: B

Material Retained on the 20mm BS Test Sieve (%):	13
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	81.3	13.7
2	74.3	10.1
3	70.9	7.7
4	67.6	4.8
6	66.4	
8	64.2	
12	63.2	
16	62.8	
24		
32		
48		
64		
96		
128		
192		
256		

Test Results.

Moisture Content (%)	17
MCV	5.9



PSL
Professional Soils Laboratory

New Victoria

Contract No:
PSL20/5386
Client Ref:
14284-AA-D

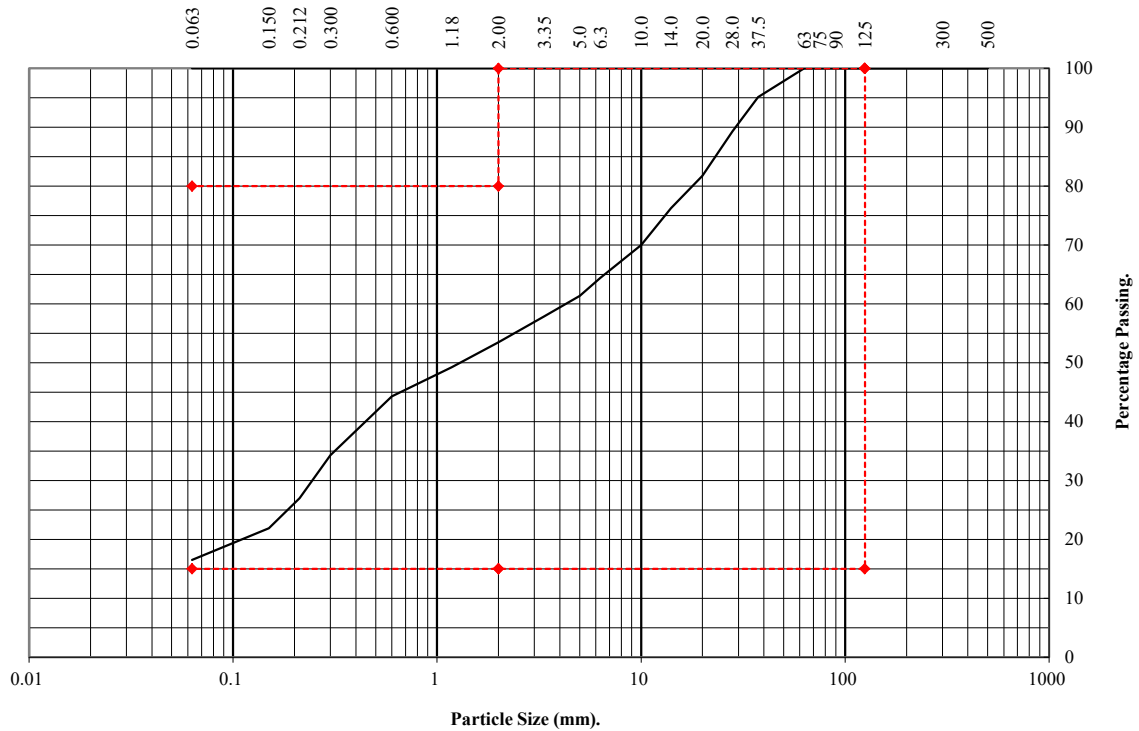
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: Sw-MG 112 Classification Type: 2C



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100	100	100
300	100		
125	100		
90	100		
75	100		
63	100		
37.5	95		
28	89		
20	82		
14	76		
10	70		
6.3	64	15	80
5	61		
3.35	58		
2	53		
1.18	49		
0.6	44	15	80
0.3	34		
0.212	27		
0.15	22		
0.063	17		

Remarks:

SHW Series 600 Table 6/2 :
Class 2C



New Victoria

Contract No.:

PSL20/5386

Client Ref:

14284-AA-D

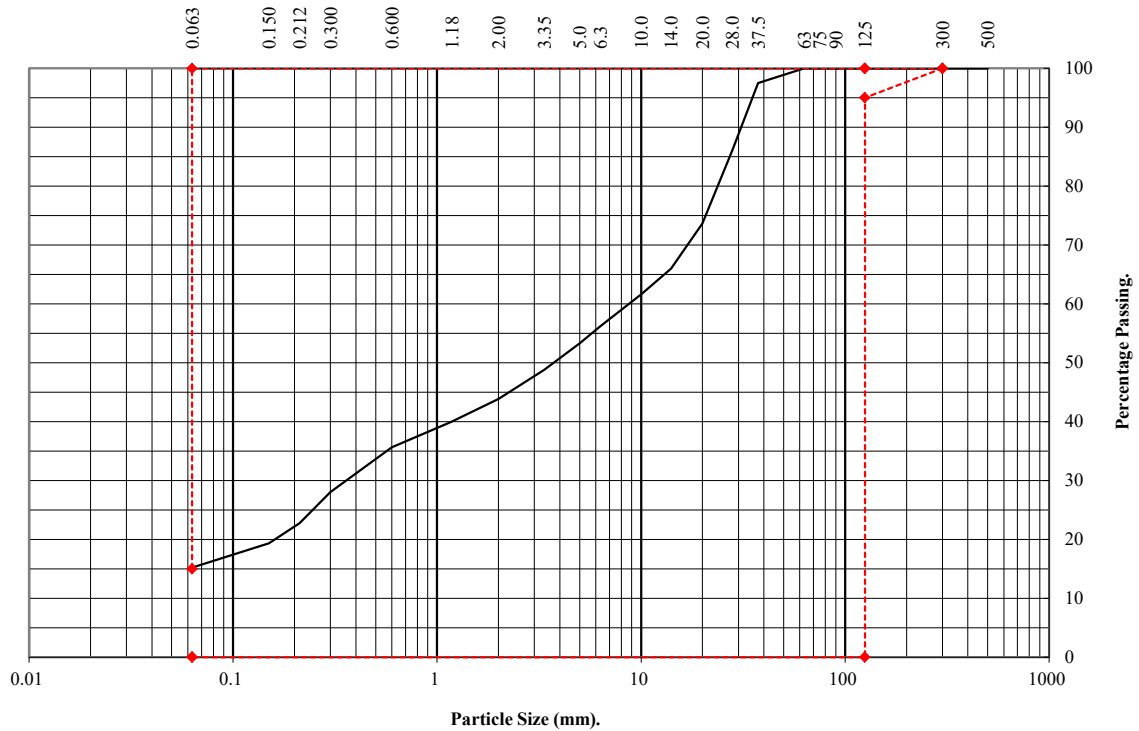
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: Sw-MG 113 Classification Type: 1A



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100		
300	100	100	100
125	100	95	100
90	100		
75	100		
63	100		
37.5	98		
28	86		
20	74		
14	66		
10	62		
6.3	56		
5	53		
3.35	49		
2	44		
1.18	40		
0.6	36		
0.3	28		
0.212	23		
0.15	19		
0.063	15	0	15

Remarks:

SHW Series 600 Table 6/2 :
Class 1A



New Victoria

Contract No.:

PSL20/5386

Client Ref:

14284-AA-D

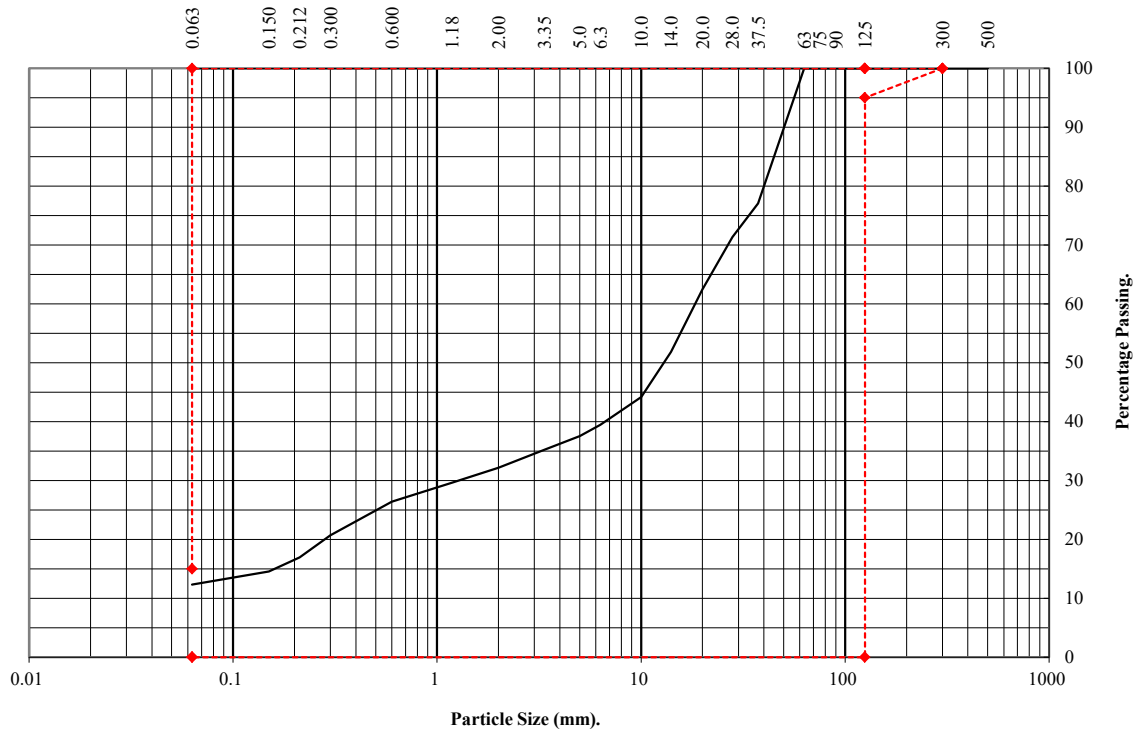
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: Sw-MG 114 Classification Type: 1A



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100		
300	100	100	100
125	100	95	100
90	100		
75	100		
63	100		
37.5	77		
28	71		
20	62		
14	52		
10	44		
6.3	39		
5	38		
3.35	35		
2	32		
1.18	30		
0.6	26		
0.3	21		
0.212	17		
0.15	15		
0.063	12	0	15

Remarks:
SHW Series 600 Table 6/2 :
Class 1A



New Victoria

Contract No.:

PSL20/5386

Client Ref:

14284-AA-D

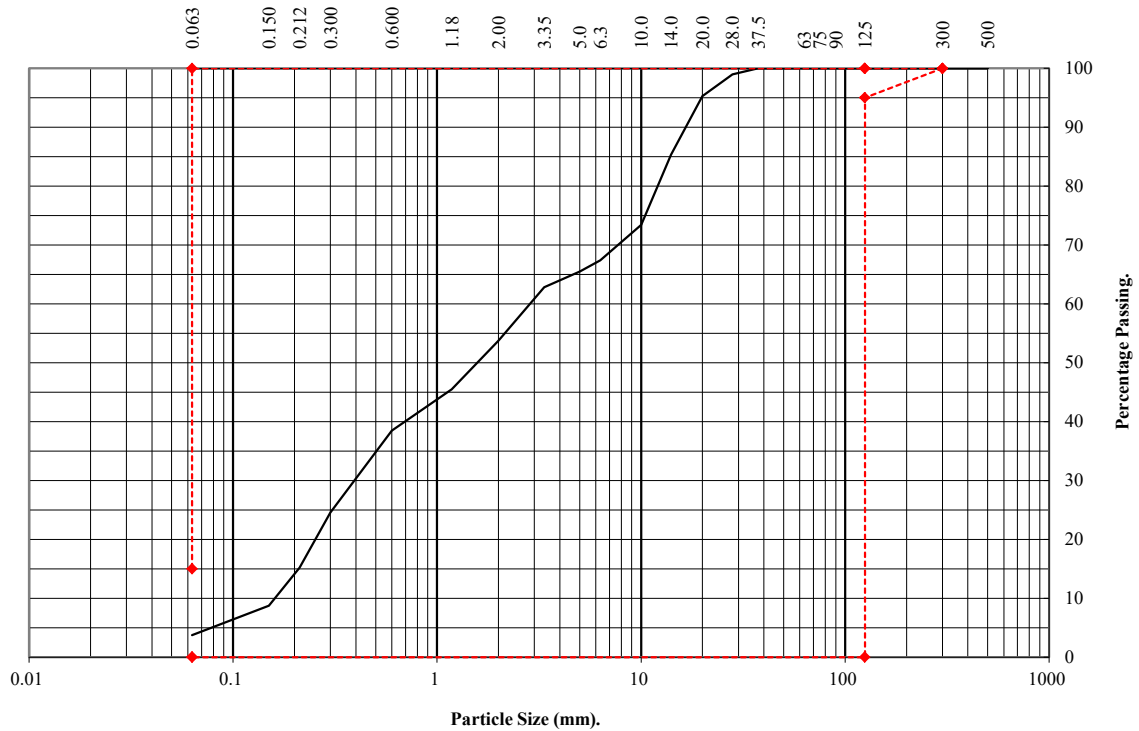
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: Sw-MG 115 Classification Type: 1A



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100		
300	100	100	100
125	100	95	100
90	100		
75	100		
63	100		
37.5	100		
28	99		
20	95		
14	85		
10	73		
6.3	67		
5	65		
3.35	63		
2	54		
1.18	45		
0.6	38		
0.3	25		
0.212	15		
0.15	9		
0.063	4	0	15

Remarks:
SHW Series 600 Table 6/2 :
Class 1A



New Victoria

Contract No.:

PSL20/5386

Client Ref:

14284-AA-D



LABORATORY REPORT



4043

Contract Number: PSL20/5773

Report Date: 23 November 2020

Client's Reference: 14284-AA-G

Client Name: E3P
Taylor Road
Urmston
Manchester
M41 7JQ

For the attention of: Andrew Allcock

Contract Title: New Victoria

Date Received: 22/10/2020

Date Commenced: 22/10/2020

Date Completed: 23/11/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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Checked and Approved Signatories:


S Royle
(Laboratory Manager)

A Watkins
(Director)

R Berriman
(Quality Manager)

H Daniels
(Senior Technician)

S Eyre
(Senior Technician)

L Knight
(Senior Technician)

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Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
IMP-C 104					6F2
IMP-C 105					6F2
IMP-C 106					6F2
IMP-C 107					6F2
IMP-C 108					6F2
IMP-C 109					6F2

		New Victoria	Contract No:
			PSL20/5773
			Client Ref:
			14284

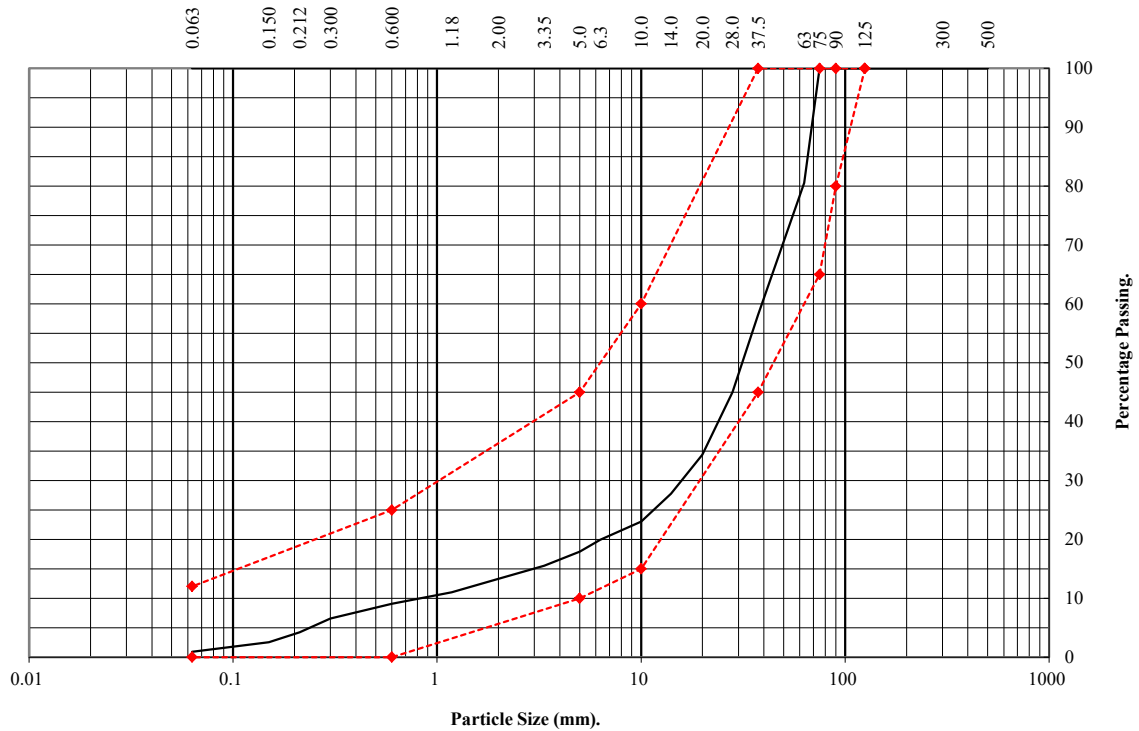
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: IMP - C 104 Classification Type: 6F2



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100		
300	100		
125	100	100	100
90	100	80	100
75	100	65	100
63	81		
37.5	58	45	100
28	45		
20	34		
14	28		
10	23	15	60
6.3	20		
5	18	10	45
3.35	16		
2	13		
1.18	11		
0.6	9	0	25
0.3	7		
0.212	4		
0.15	3		
0.063	1	0	12

Remarks:

SHW Series 600 Table 6/2 :
Class 6F2



New Victoria

Contract No.:

PSL20/5773

Client Ref:

14284

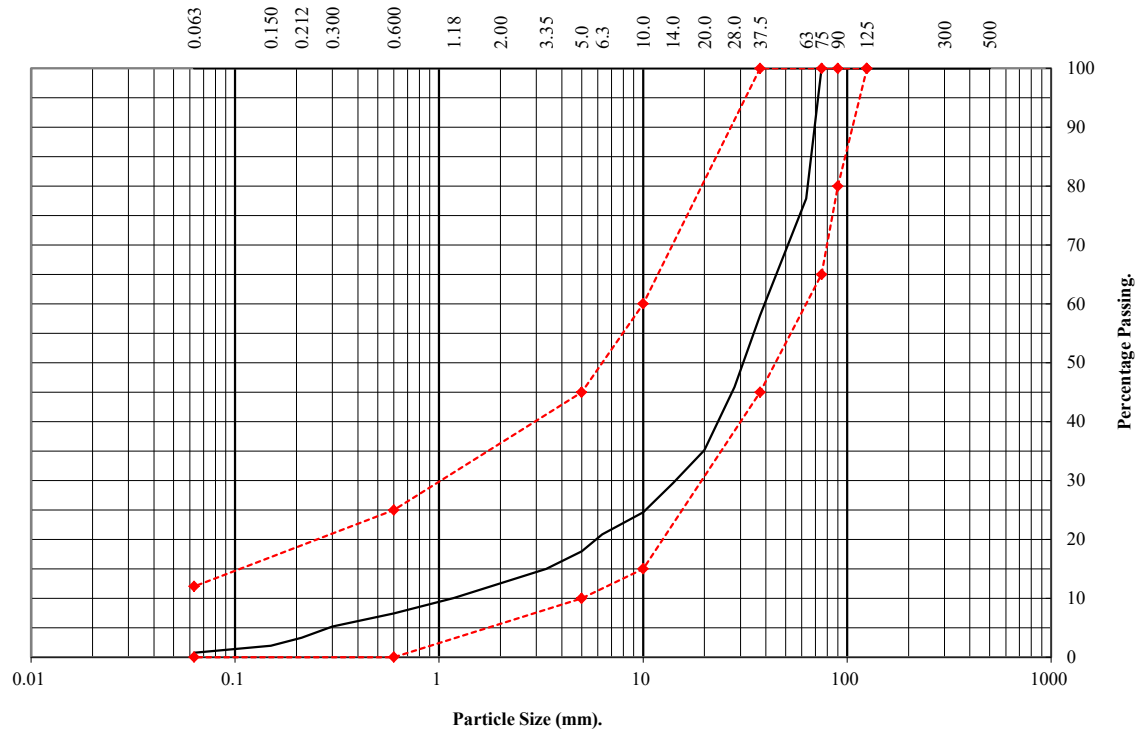
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: IMP - C 105 Classification Type: 6F2



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100		
300	100		
125	100	100	100
90	100	80	100
75	100	65	100
63	78		
37.5	58	45	100
28	46		
20	35		
14	30		
10	25	15	60
6.3	21		
5	18	10	45
3.35	15		
2	13		
1.18	10		
0.6	7	0	25
0.3	5		
0.212	3		
0.15	2		
0.063	1	0	12

Remarks:
SHW Series 600 Table 6/2 :
Class 6F2



New Victoria

Contract No.:

PSL20/5773

Client Ref:

14284

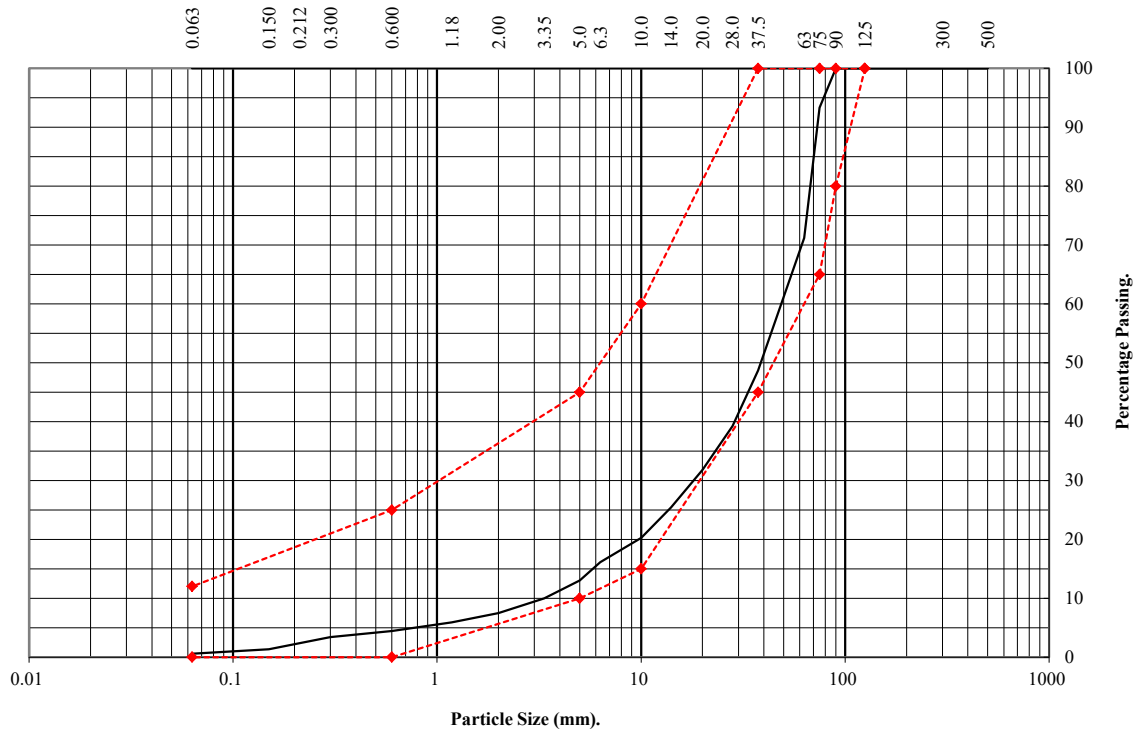
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: IMP - C 106 Classification Type: 6F2



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100		
300	100		
125	100	100	100
90	100	80	100
75	93	65	100
63	71		
37.5	49	45	100
28	39		
20	32		
14	25		
10	20	15	60
6.3	16		
5	13	10	45
3.35	10		
2	7		
1.18	6		
0.6	4	0	25
0.3	3		
0.212	2		
0.15	1		
0.063	1	0	12

Remarks:

SHW Series 600 Table 6/2 :
Class 6F2



New Victoria

Contract No.:

PSL20/5773

Client Ref:

14284

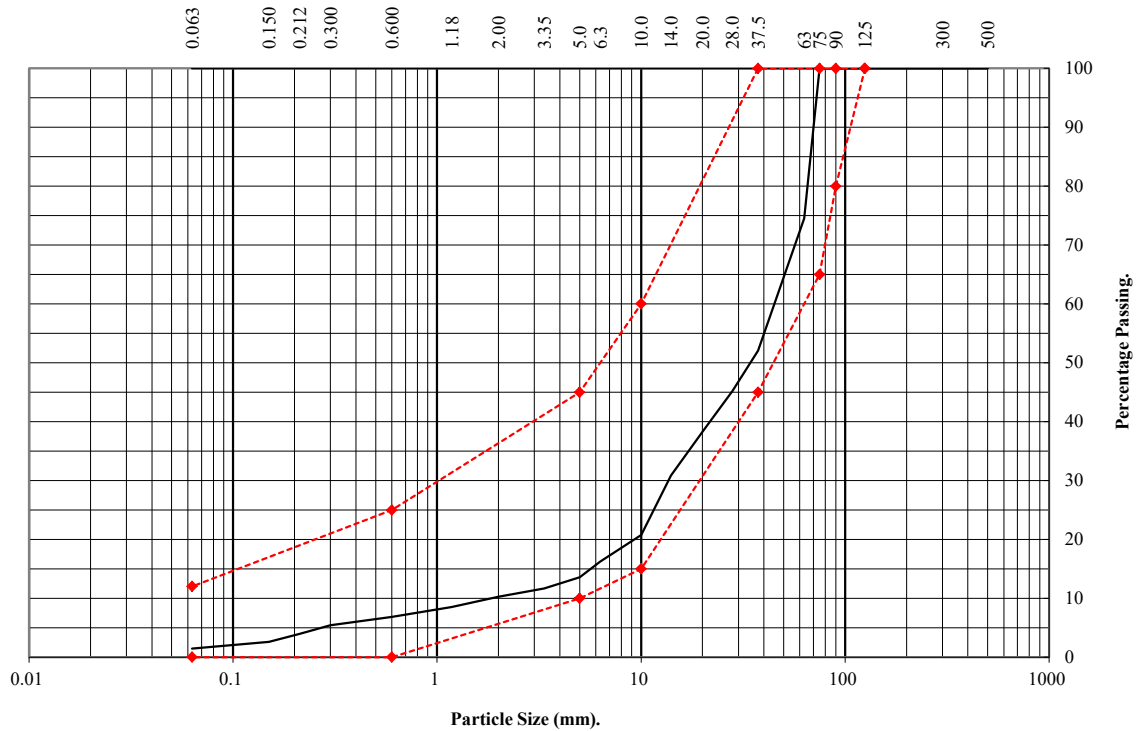
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: IMP - C 107 Classification Type: 6F2



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100		
300	100		
125	100	100	100
90	100	80	100
75	100	65	100
63	75		
37.5	52	45	100
28	45		
20	38		
14	31		
10	21	15	60
6.3	16		
5	14	10	45
3.35	12		
2	10		
1.18	9		
0.6	7	0	25
0.3	5		
0.212	4		
0.15	3		
0.063	1	0	12

Remarks:

SHW Series 600 Table 6/2 :
Class 6F2



New Victoria

Contract No.:

PSL20/5773

Client Ref:

14284

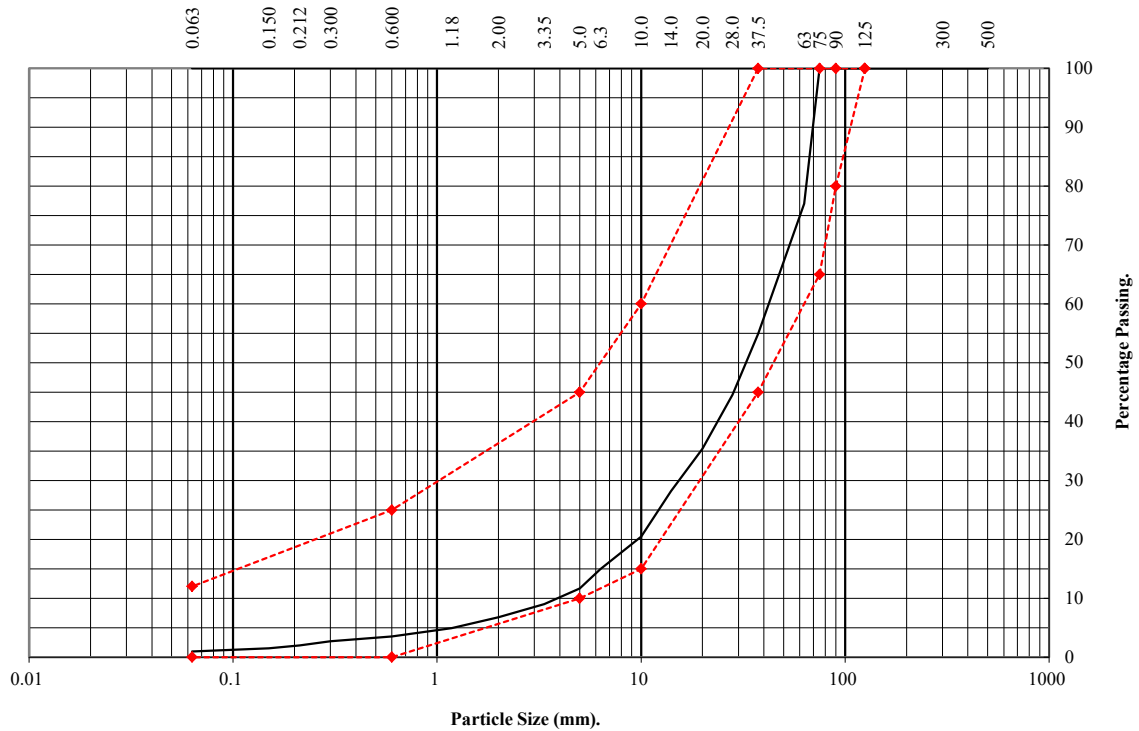
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: IMP - C 108 Classification Type: 6F2



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100		
300	100		
125	100	100	100
90	100	80	100
75	100	65	100
63	77		
37.5	55	45	100
28	45		
20	35		
14	28		
10	20	15	60
6.3	15		
5	12	10	45
3.35	9		
2	7		
1.18	5		
0.6	4	0	25
0.3	3		
0.212	2		
0.15	2		
0.063	1	0	12

Remarks:

SHW Series 600 Table 6/2 :
Class 6F2



New Victoria

Contract No.:

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Client Ref:

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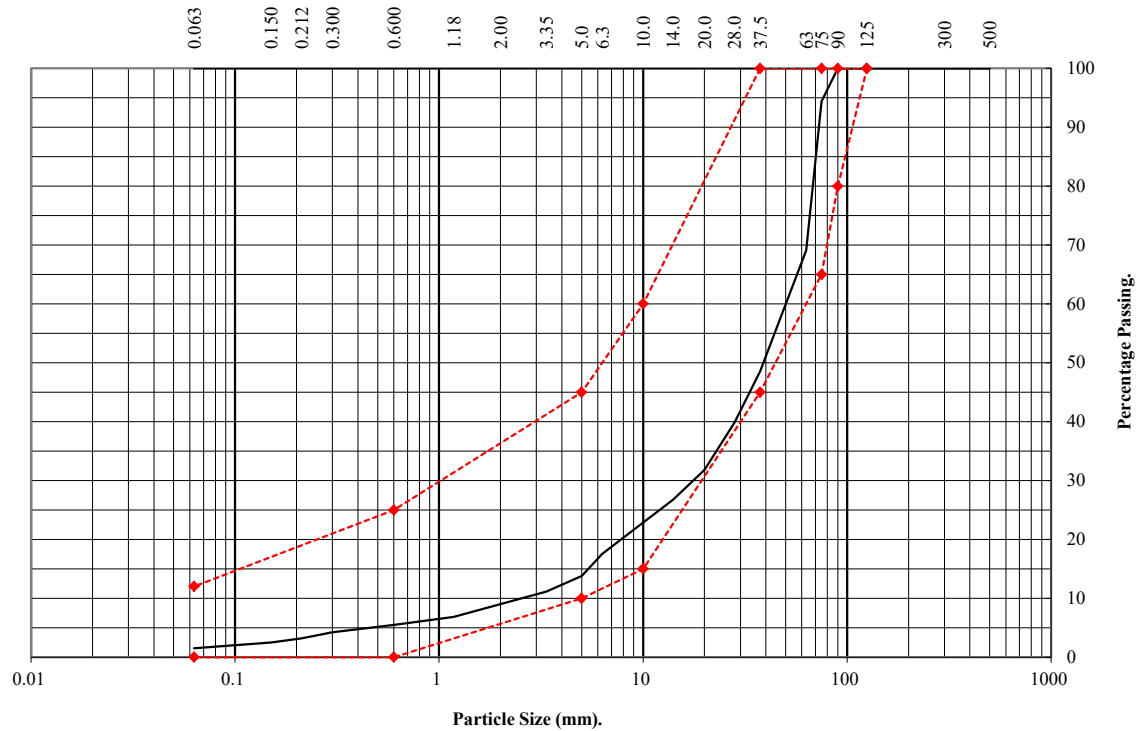
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Number: IMP - C 109 Classification Type: 6F2



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements	
		Lower	Upper
500	100		
300	100		
125	100	100	100
90	100	80	100
75	94	65	100
63	69		
37.5	49	45	100
28	40		
20	32		
14	27		
10	23	15	60
6.3	18		
5	14	10	45
3.35	11		
2	9		
1.18	7		
0.6	5	0	25
0.3	4		
0.212	3		
0.15	2		
0.063	2	0	12

Remarks:
SHW Series 600 Table 6/2 :
Class 6F2



New Victoria

Contract No.:

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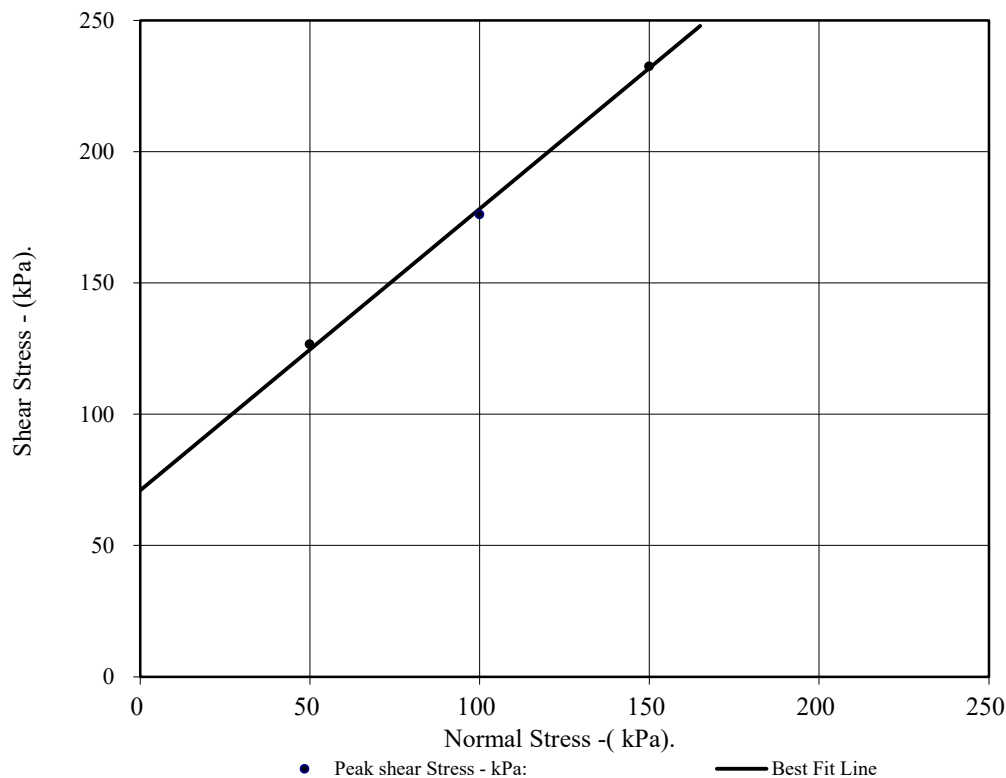
Client Ref:

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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:			Top Depth:		
Sample Number:	IMP - C 104		Base Depth:		
Sample Conditions:	Dry		Sample Type		
Particle Density - Mg/m3:	2.65	Assumed	Remarks:		
Sample Preparation:	Material tested passing 20mm sieve Remoulded using 2.5kg effort.				
Sample Description:	See summary of soil descriptions				
STAGE			1	2	3
Initial Conditions					
Height - mm:			150	150	150
Length - mm:			300	300	300
Moisture Content - %:			5.6	5.6	5.6
Bulk Density - Mg/m3:			1.91	1.91	1.91
Dry Density - Mg/m3:			1.81	1.81	1.81
Voids Ratio:			0.468	0.468	0.468
Normal Pressure- kPa			50	100	150
Consolidation Stage					
Consolidated Height - mm:			149.67	149.00	148.03
Shearing Stage					
Rate of Strain (mm/min)			1.00	1.00	1.00
Displacement at peak shear stress (mm)			28.00	49.00	36.00
Peak shear Stress - kPa:			127	176	233
Final Consolidated Conditions					
Moisture Content - %:			5.4	5.2	5.1
Bulk Density - Mg/m3:			1.91	1.92	1.93
Dry Density - Mg/m3:			1.81	1.83	1.84
Peak					
Angle of Shearing Resistance:(θ)			47		
Effective Cohesion - kPa:			71		



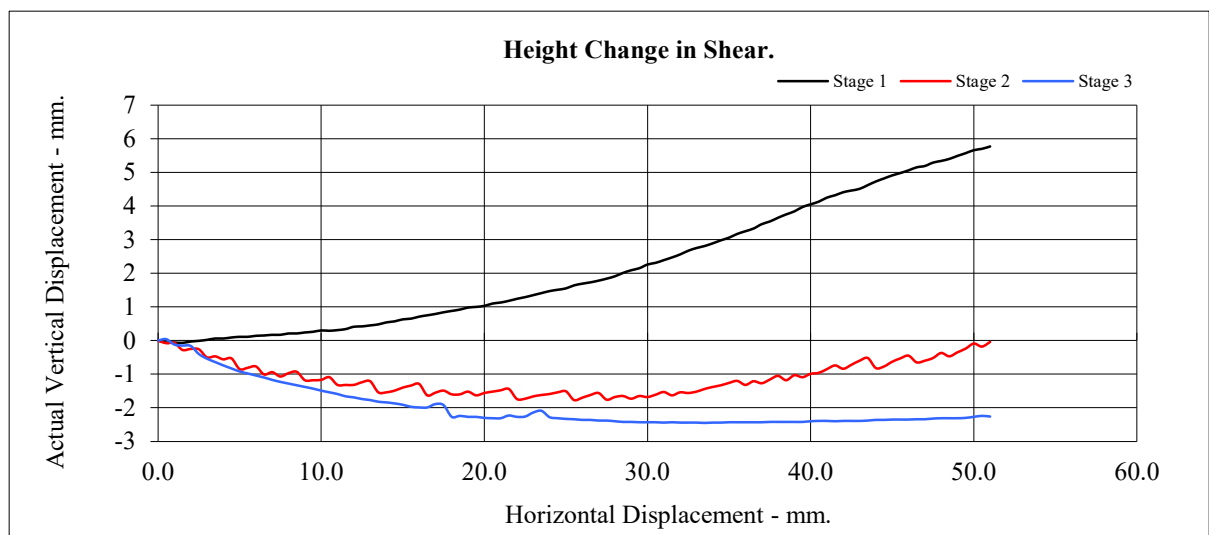
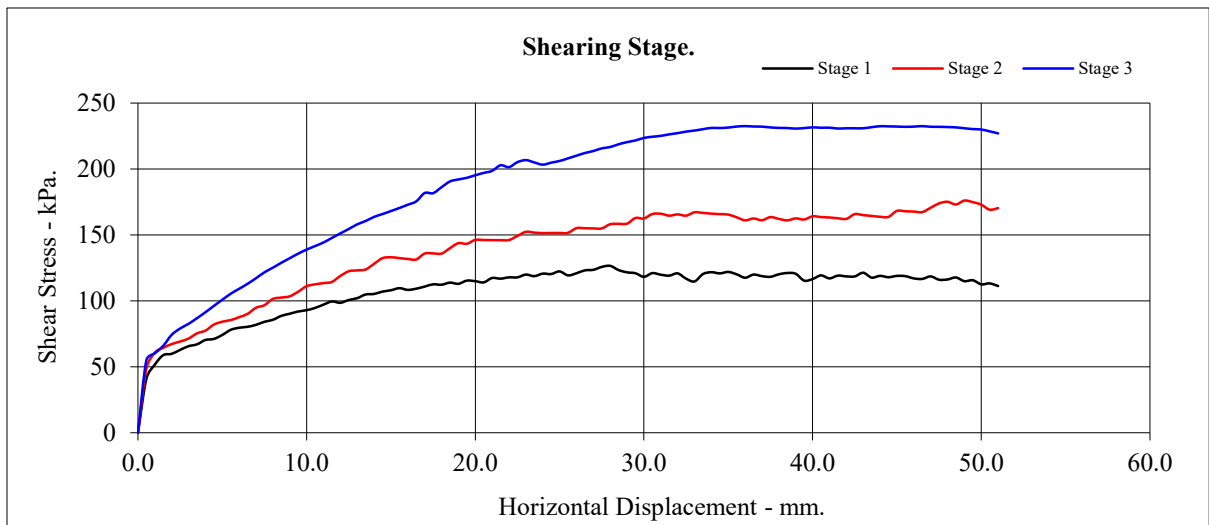
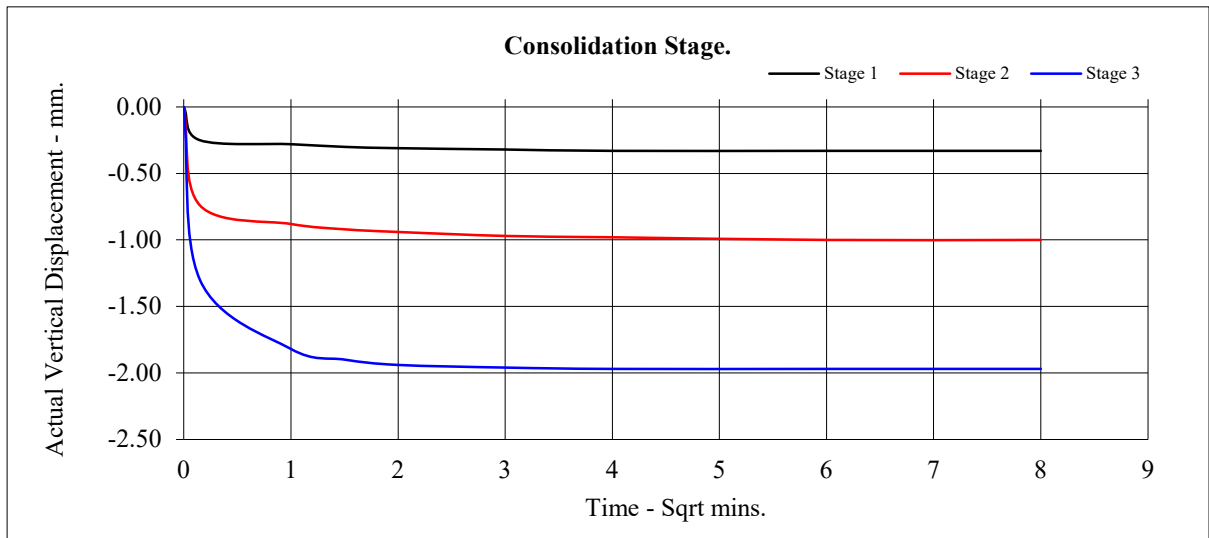
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Client Ref:
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:		Top Depth:	
Sample Number:	IMP - C 104	Base Depth:	



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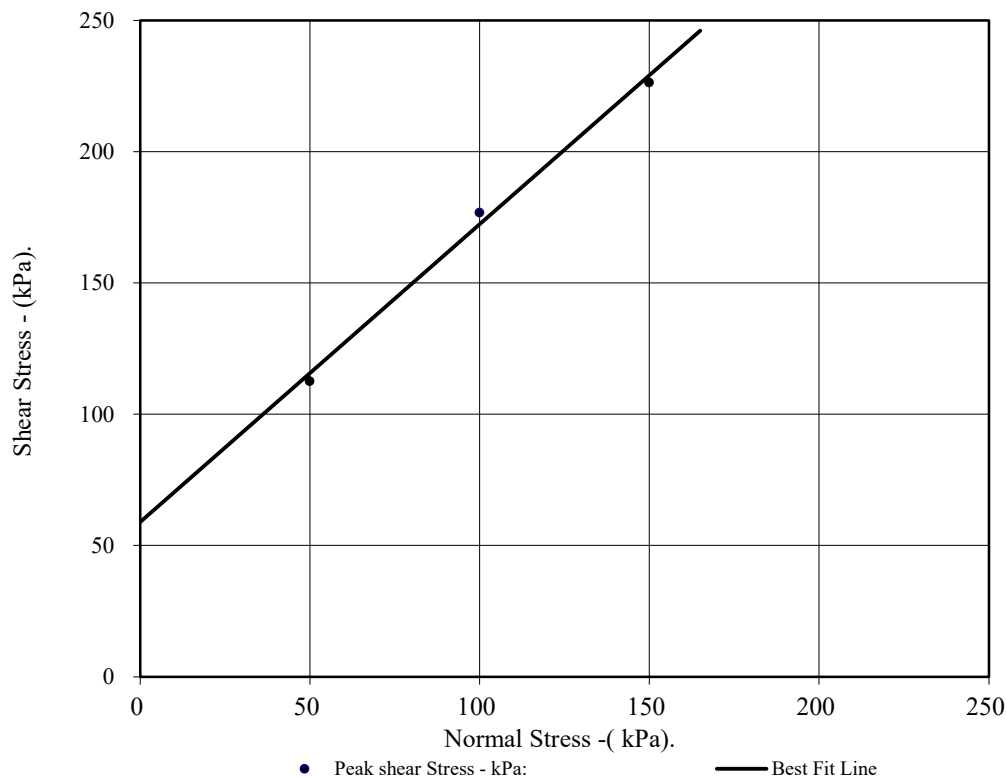
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Client Ref:
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:			Top Depth:		
Sample Number:	IMP - C 105		Base Depth:		
Sample Conditions:	Dry		Sample Type		
Particle Density - Mg/m3:	2.65	Assumed	Remarks:		
Sample Preparation:	Material tested passing 20mm sieve Remoulded using 2.5kg effort.				
Sample Description:	See summary of soil descriptions				
STAGE			1	2	3
Initial Conditions					
Height - mm:			137	137	137
Length - mm:			300	300	300
Moisture Content - %:			7.8	7.8	7.8
Bulk Density - Mg/m3:			1.89	1.89	1.89
Dry Density - Mg/m3:			1.76	1.76	1.76
Voids Ratio:			0.508	0.508	0.508
Normal Pressure- kPa			50	100	150
Consolidation Stage					
Consolidated Height - mm:			135.77	135.20	134.35
Shearing Stage					
Rate of Strain (mm/min)			1.00	1.00	1.00
Displacement at peak shear stress (mm)			34.50	42.00	49.50
Peak shear Stress - kPa:			113	177	226
Final Consolidated Conditions					
Moisture Content - %:			7.5	7.7	7.2
Bulk Density - Mg/m3:			1.91	1.92	1.93
Dry Density - Mg/m3:			1.78	1.78	1.80
Peak					
Angle of Shearing Resistance:(θ)			49		
Effective Cohesion - kPa:			59		



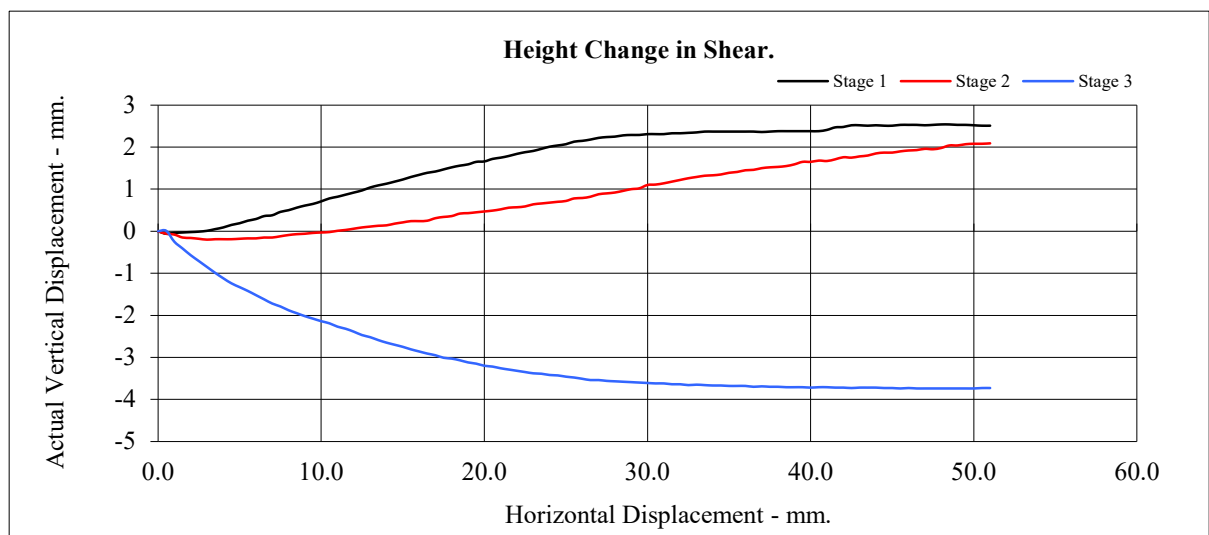
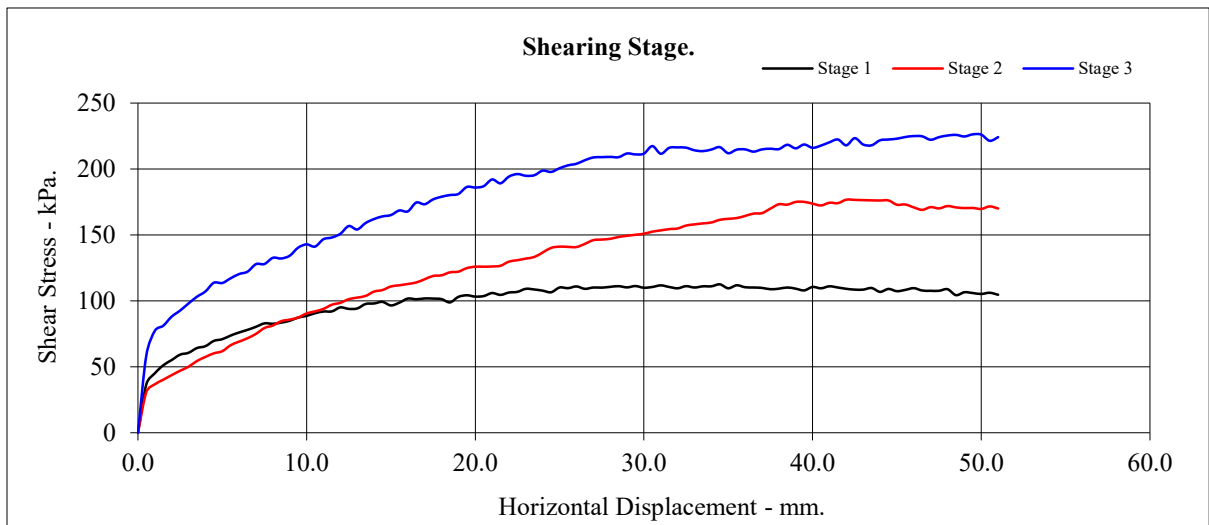
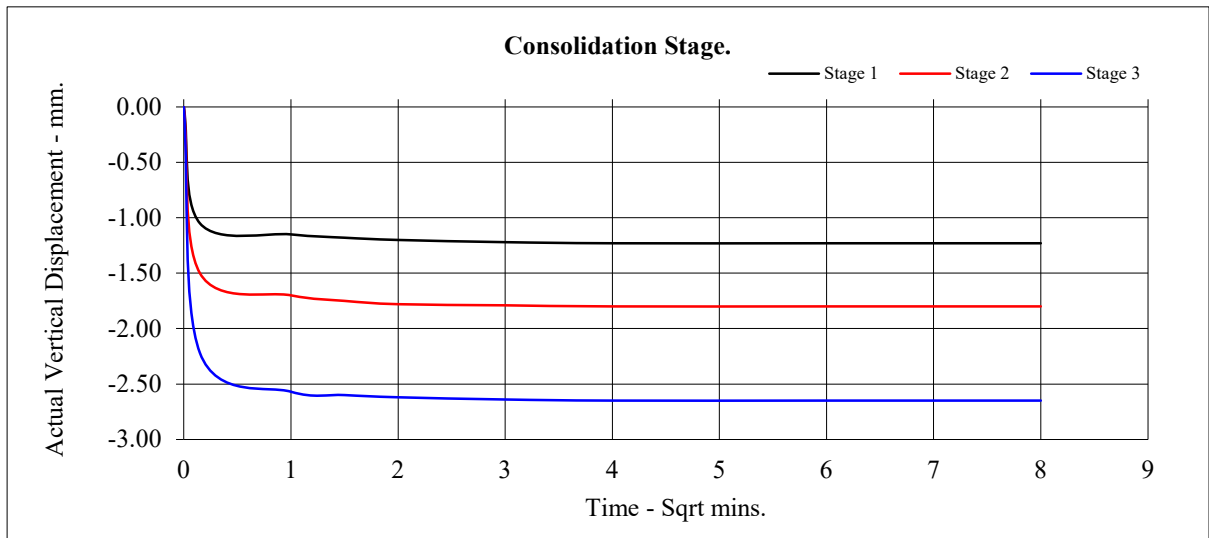
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Client Ref:
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:		Top Depth:	
Sample Number:	IMP - C 105	Base Depth:	



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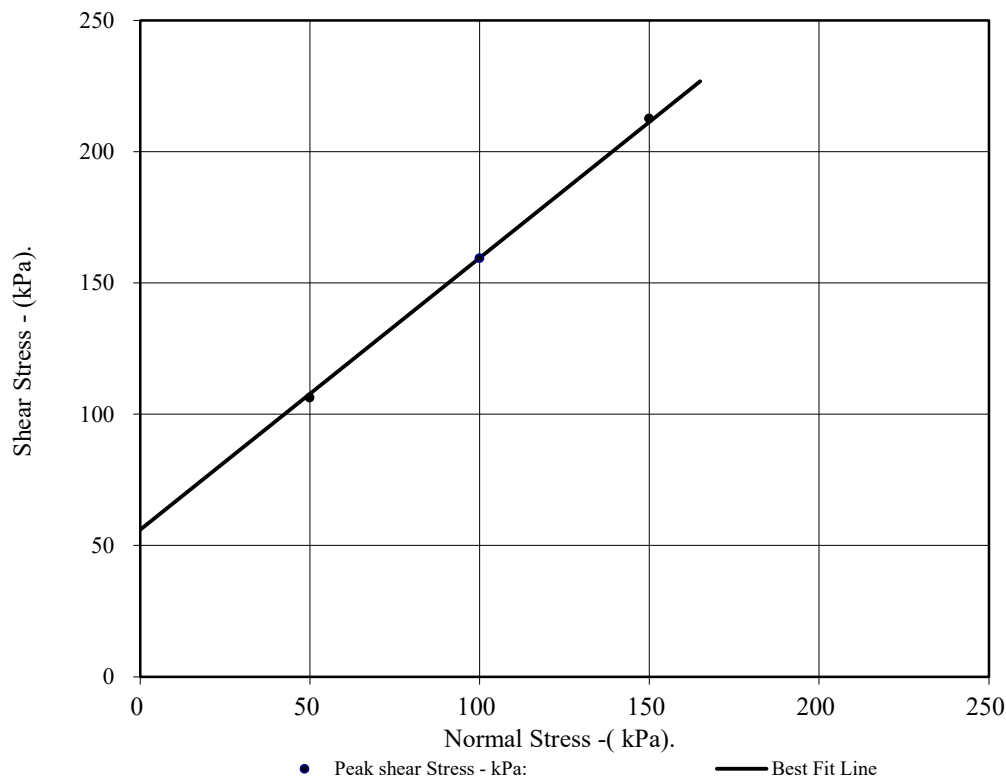
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:			Top Depth:		
Sample Number:	IMP - C 106		Base Depth:		
Sample Conditions:	Dry		Sample Type		
Particle Density - Mg/m3:	2.65	Assumed	Remarks:		
Sample Preparation:	Material tested passing 20mm sieve Remoulded using 2.5kg effort.				
Sample Description:	See summary of soil descriptions				
STAGE			1	2	3
Initial Conditions					
Height - mm:			150	150	150
Length - mm:			300	300	300
Moisture Content - %:			6.9	6.9	6.9
Bulk Density - Mg/m3:			2.00	2.00	2.00
Dry Density - Mg/m3:			1.87	1.87	1.87
Voids Ratio:			0.414	0.414	0.414
Normal Pressure- kPa			50	100	150
Consolidation Stage					
Consolidated Height - mm:			149.00	148.55	148.10
Shearing Stage					
Rate of Strain (mm/min)			1.00	1.00	1.00
Displacement at peak shear stress (mm)			12.00	27.00	25.50
Peak shear Stress - kPa:			106	159	213
Final Consolidated Conditions					
Moisture Content - %:			6.9	6.4	6.5
Bulk Density - Mg/m3:			2.02	2.02	2.03
Dry Density - Mg/m3:			1.89	1.90	1.91
Peak					
Angle of Shearing Resistance:(θ)			46		
Effective Cohesion - kPa:			56		



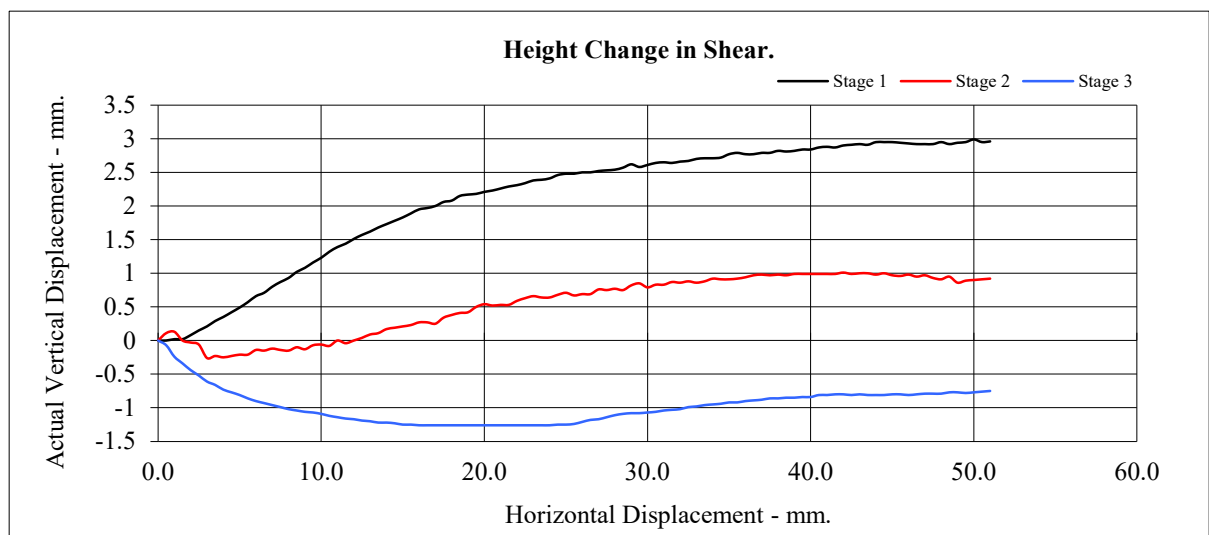
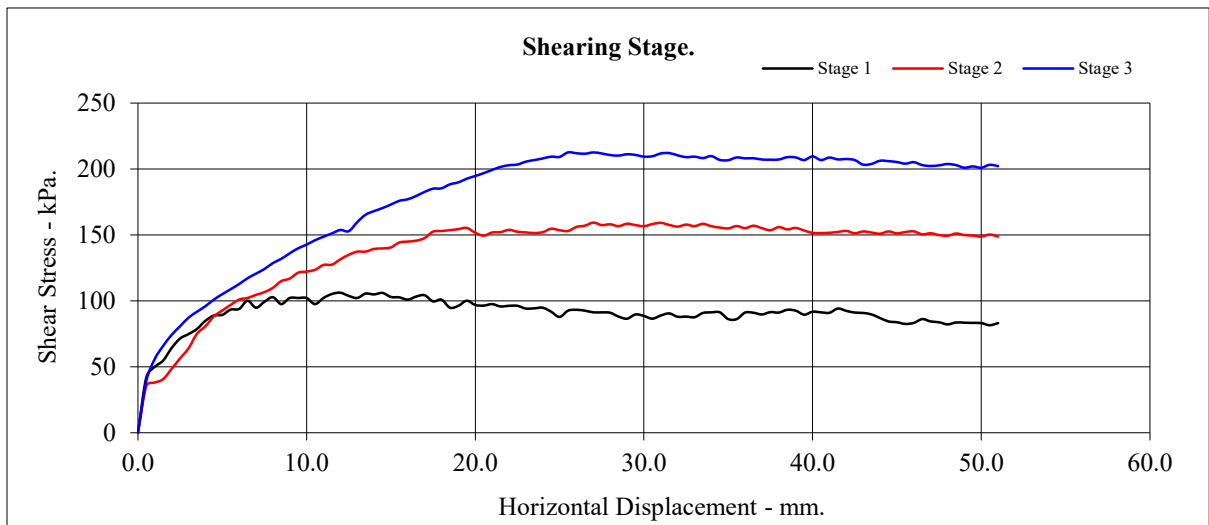
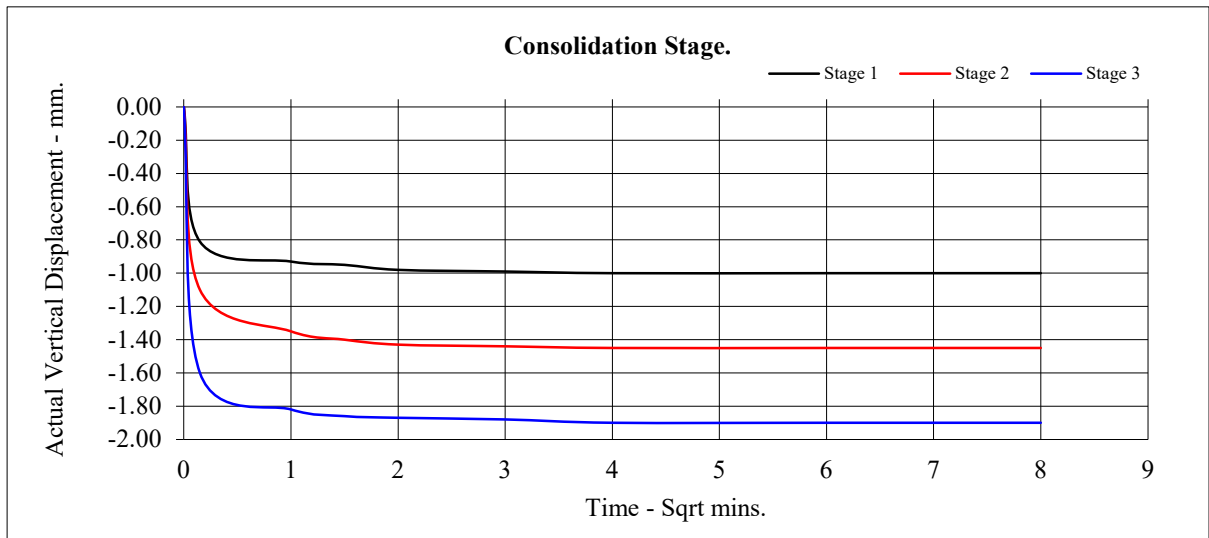
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Client Ref:
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:		Top Depth:	
Sample Number:	IMP - C 106	Base Depth:	



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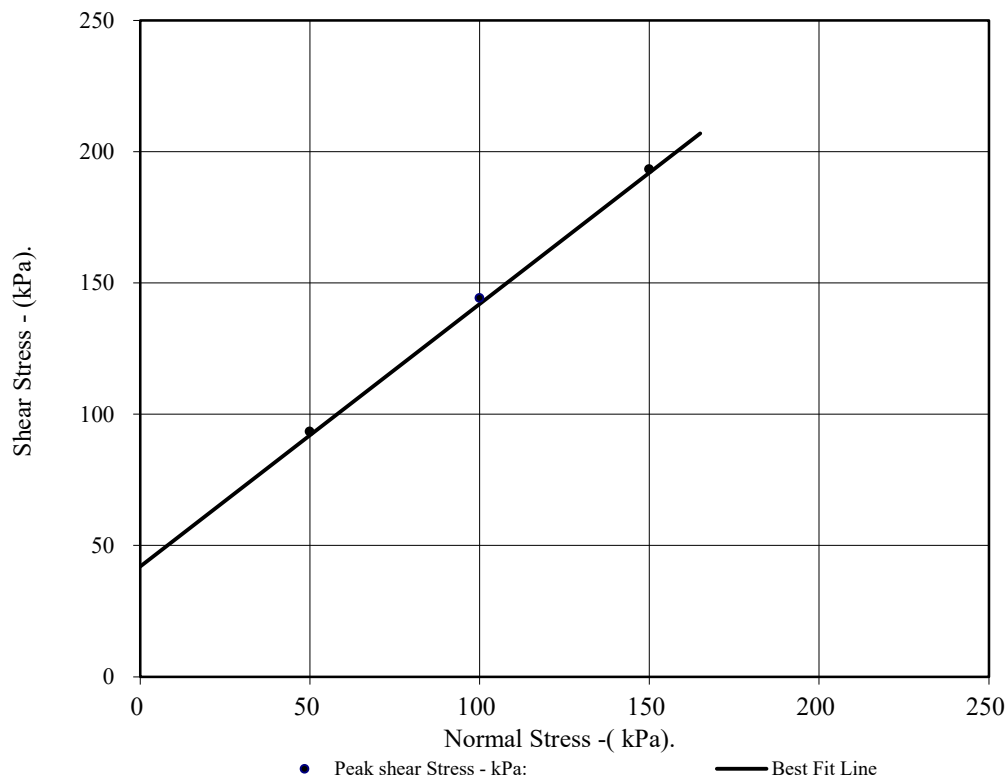
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Client Ref:
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:			Top Depth:		
Sample Number:	IMP - C 107		Base Depth:		
Sample Conditions:	Dry		Sample Type		
Particle Density - Mg/m3:	2.65	Assumed	Remarks:		
Sample Preparation:	Material tested passing 20mm sieve Remoulded using 2.5kg effort.				
Sample Description:	See summary of soil descriptions				
STAGE			1	2	3
Initial Conditions					
Height - mm:			150	150	150
Length - mm:			300	300	300
Moisture Content - %:			6.0	6.0	6.0
Bulk Density - Mg/m3:			1.97	1.97	1.97
Dry Density - Mg/m3:			1.85	1.85	1.85
Voids Ratio:			0.429	0.429	0.429
Normal Pressure- kPa			50	100	150
Consolidation Stage					
Consolidated Height - mm:			149.30	148.88	148.47
Shearing Stage					
Rate of Strain (mm/min)			1.00	1.00	1.00
Displacement at peak shear stress (mm)			19.00	25.50	43.50
Peak shear Stress - kPa:			93	144	193
Final Consolidated Conditions					
Moisture Content - %:			5.8	5.2	5.7
Bulk Density - Mg/m3:			1.98	1.98	1.99
Dry Density - Mg/m3:			1.87	1.88	1.88
Peak					
Angle of Shearing Resistance:(θ)			45		
Effective Cohesion - kPa:			42		



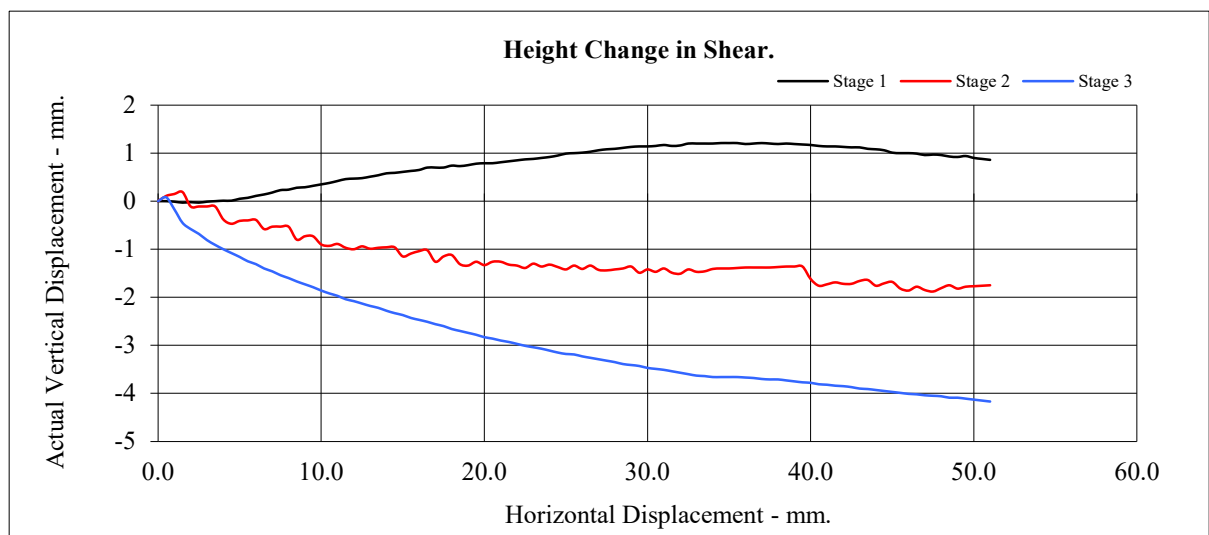
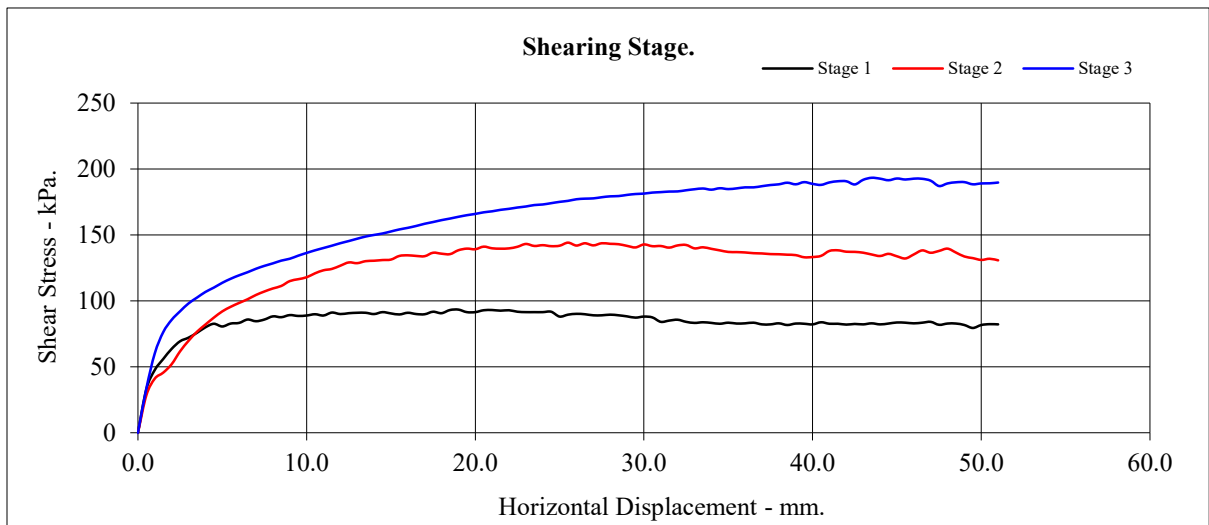
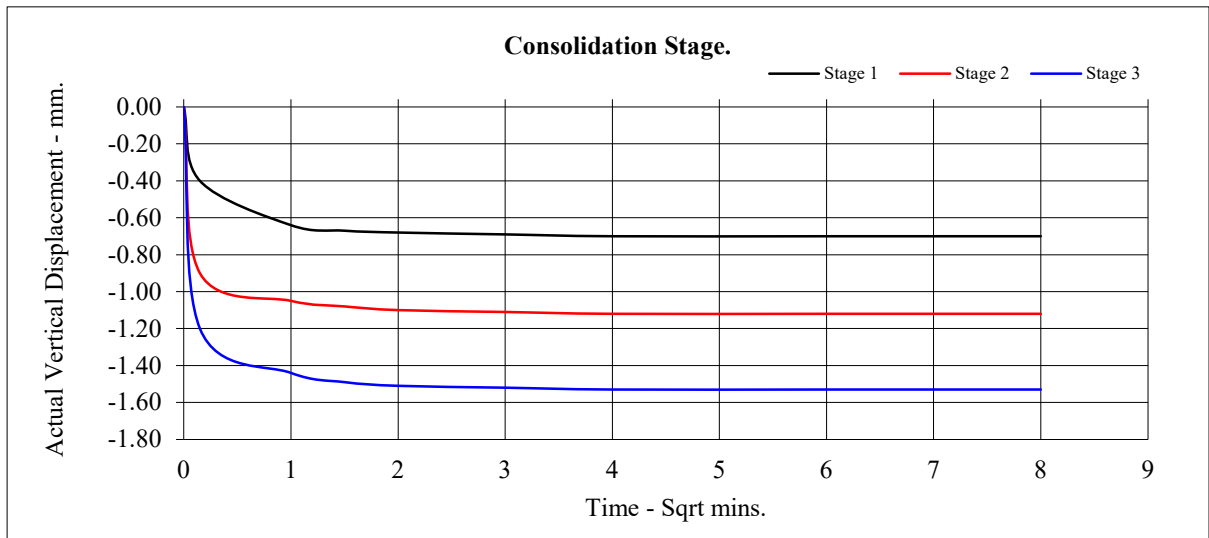
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BS1377:Part 7:1990 Clause 5

Hole Number:		Top Depth:	
Sample Number:	IMP - C 107	Base Depth:	



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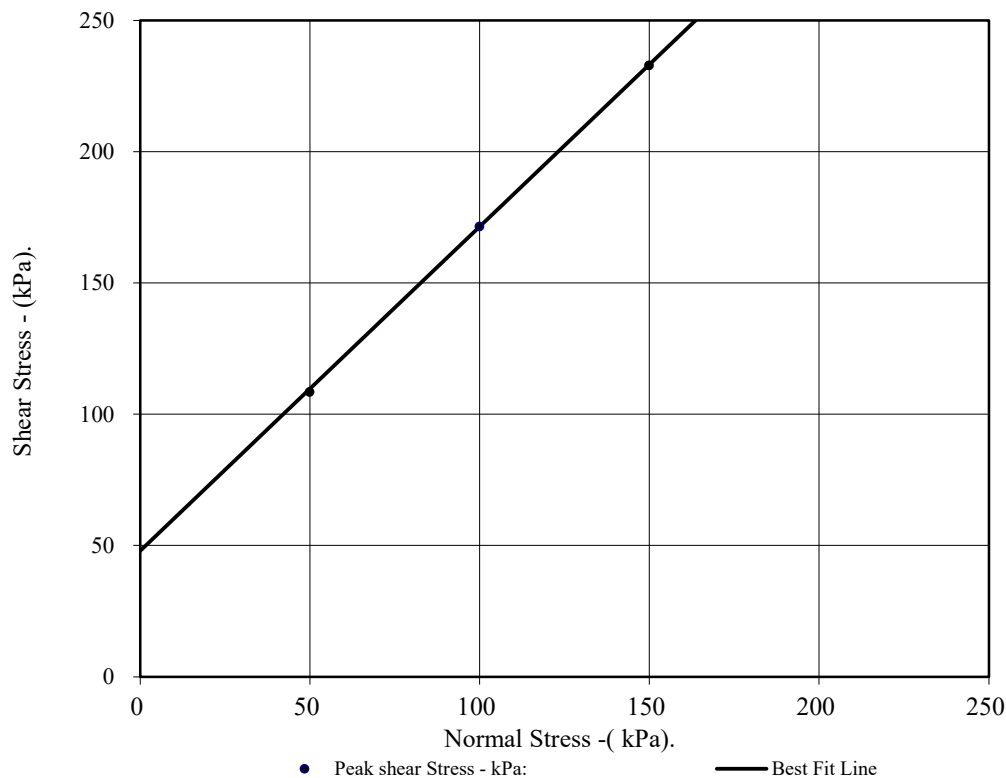
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:			Top Depth:		
Sample Number:	IMP - C 108		Base Depth:		
Sample Conditions:	Dry		Sample Type		
Particle Density - Mg/m3:	2.65	Assumed	Remarks:		
Sample Preparation:	Material tested passing 20mm sieve Remoulded using 2.5kg effort.				
Sample Description:	See summary of soil descriptions				
STAGE			1	2	3
Initial Conditions					
Height - mm:			130	130	130
Length - mm:			300	300	300
Moisture Content - %:			7.0	7.0	7.0
Bulk Density - Mg/m3:			1.96	1.96	1.96
Dry Density - Mg/m3:			1.83	1.83	1.83
Voids Ratio:			0.445	0.445	0.445
Normal Pressure- kPa			50	100	150
Consolidation Stage					
Consolidated Height - mm:			129.15	128.74	128.10
Shearing Stage					
Rate of Strain (mm/min)			1.00	1.00	1.00
Displacement at peak shear stress (mm)			19.50	12.50	23.50
Peak shear Stress - kPa:			108	172	233
Final Consolidated Conditions					
Moisture Content - %:			6.8	6.5	6.7
Bulk Density - Mg/m3:			1.97	1.98	1.99
Dry Density - Mg/m3:			1.85	1.86	1.87
Peak					
Angle of Shearing Resistance:(θ)			51		
Effective Cohesion - kPa:			48		



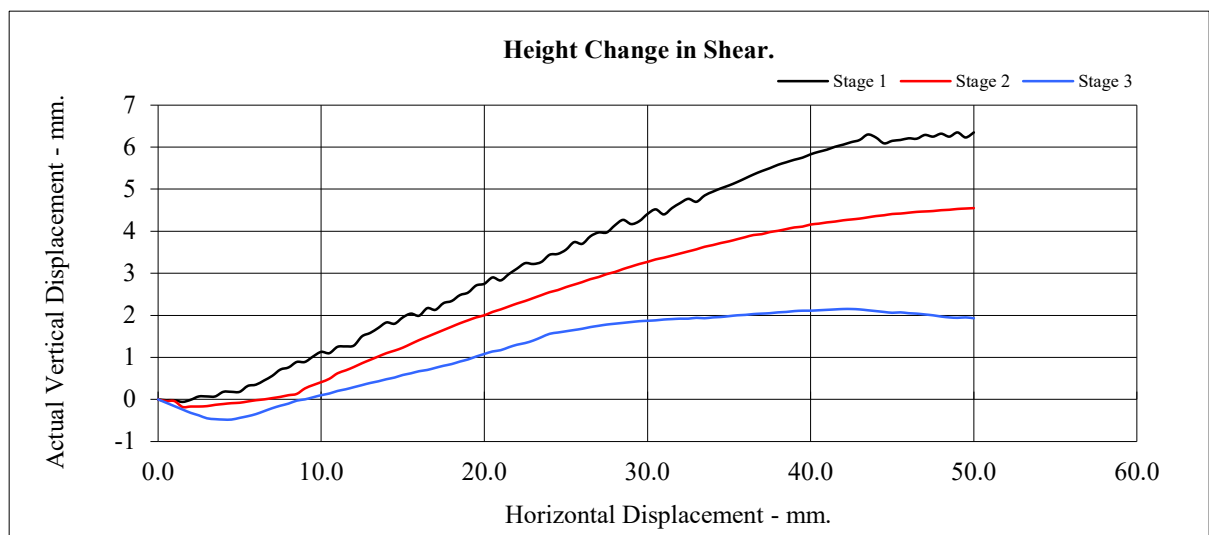
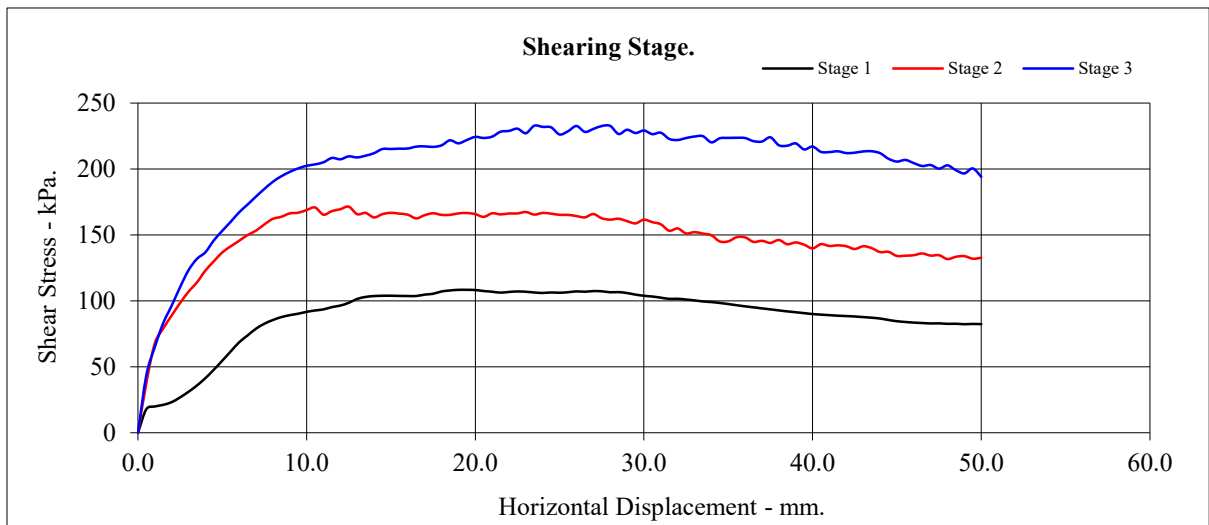
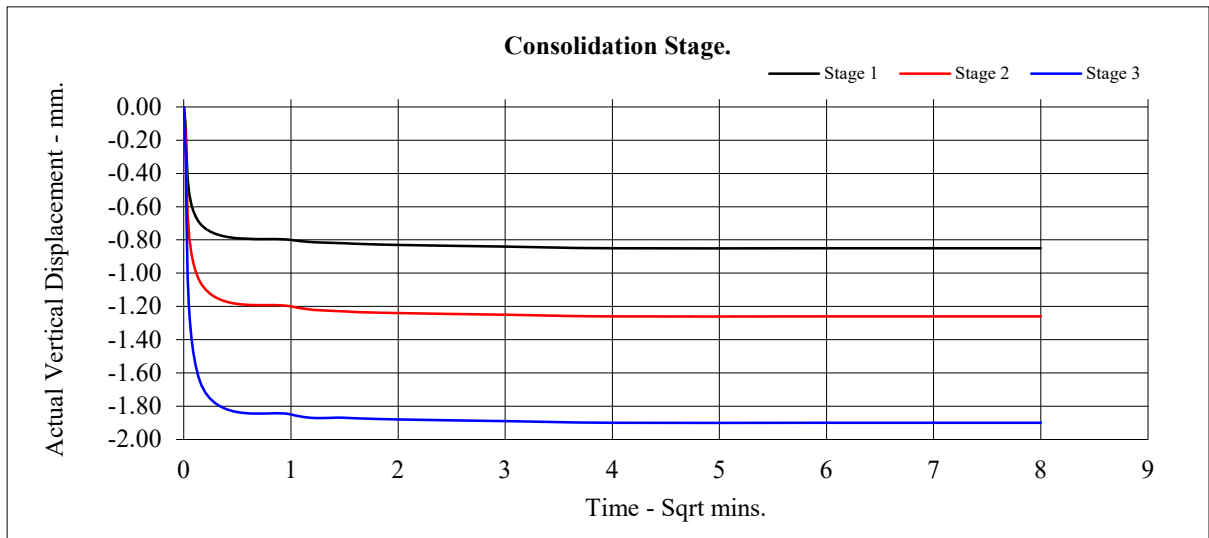
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:		Top Depth:	
Sample Number:	IMP - C 108	Base Depth:	



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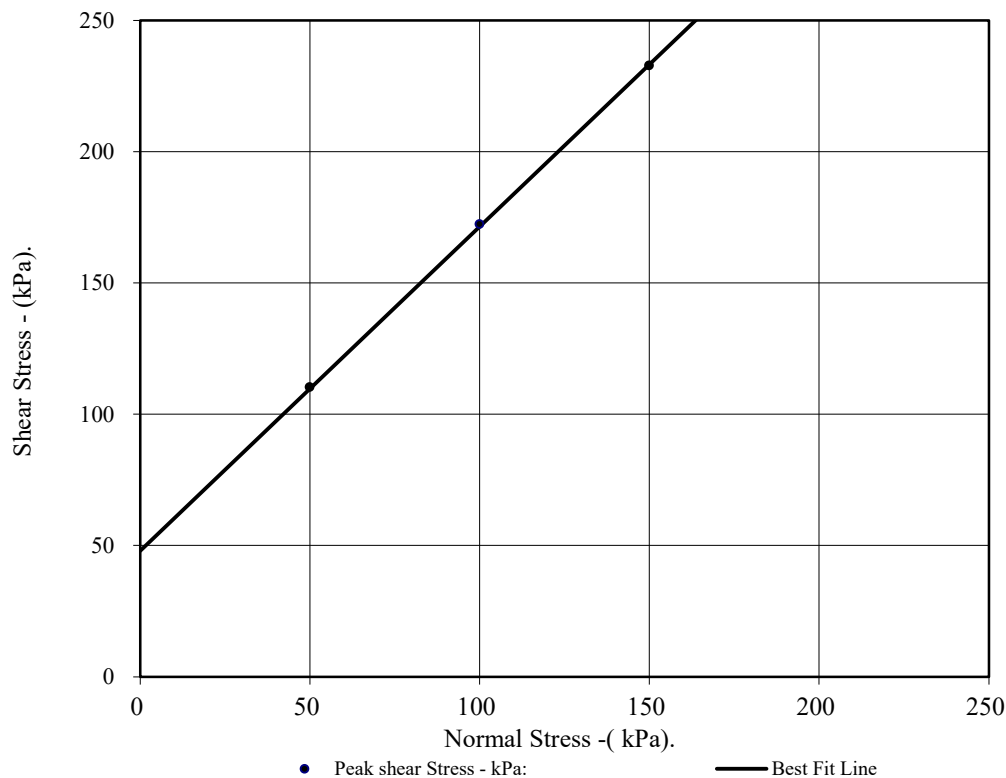
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:			Top Depth:		
Sample Number:	IMP - C 109		Base Depth:		
Sample Conditions:	Dry		Sample Type		
Particle Density - Mg/m3:	2.65	Assumed	Remarks:		
Sample Preparation:	Material tested passing 20mm sieve Remoulded using 2.5kg effort.				
Sample Description:	See summary of soil descriptions				
STAGE			1	2	3
Initial Conditions					
Height - mm:			140	140	140
Length - mm:			300	300	300
Moisture Content - %:			5.9	5.9	5.9
Bulk Density - Mg/m3:			1.91	1.91	1.91
Dry Density - Mg/m3:			1.81	1.81	1.81
Voids Ratio:			0.466	0.466	0.466
Normal Pressure- kPa			50	100	150
Consolidation Stage					
Consolidated Height - mm:			139.47	139.04	138.33
Shearing Stage					
Rate of Strain (mm/min)			1.00	1.00	1.00
Displacement at peak shear stress (mm)			48.00	49.50	48.50
Peak shear Stress - kPa:			110	172	233
Final Consolidated Conditions					
Moisture Content - %:			5.7	5.9	5.4
Bulk Density - Mg/m3:			1.92	1.93	1.94
Dry Density - Mg/m3:			1.82	1.82	1.84
Peak					
Angle of Shearing Resistance:(θ)			51		
Effective Cohesion - kPa:			48		



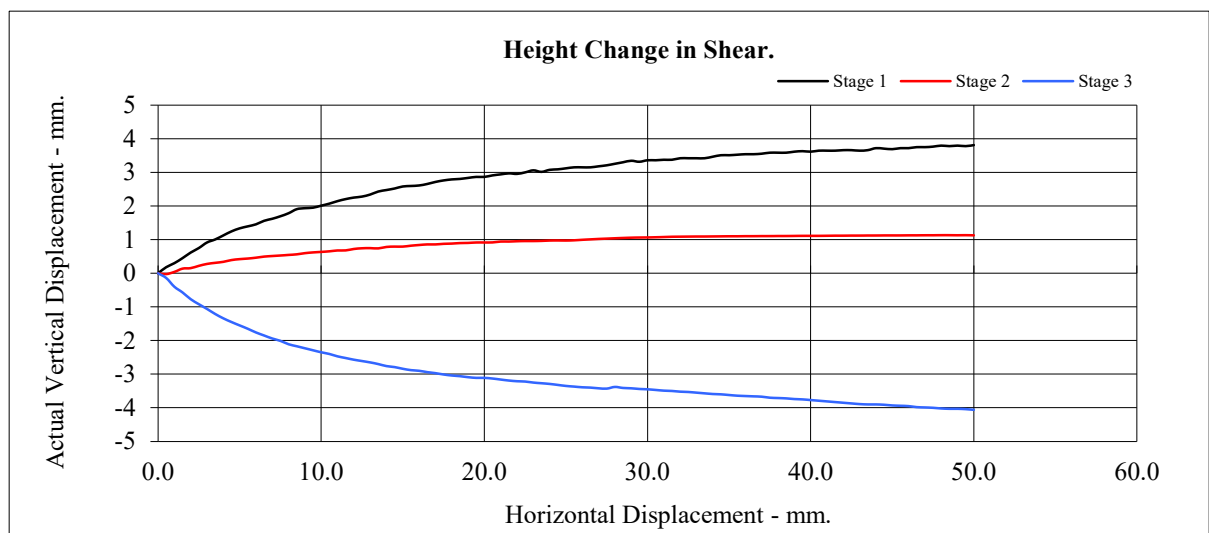
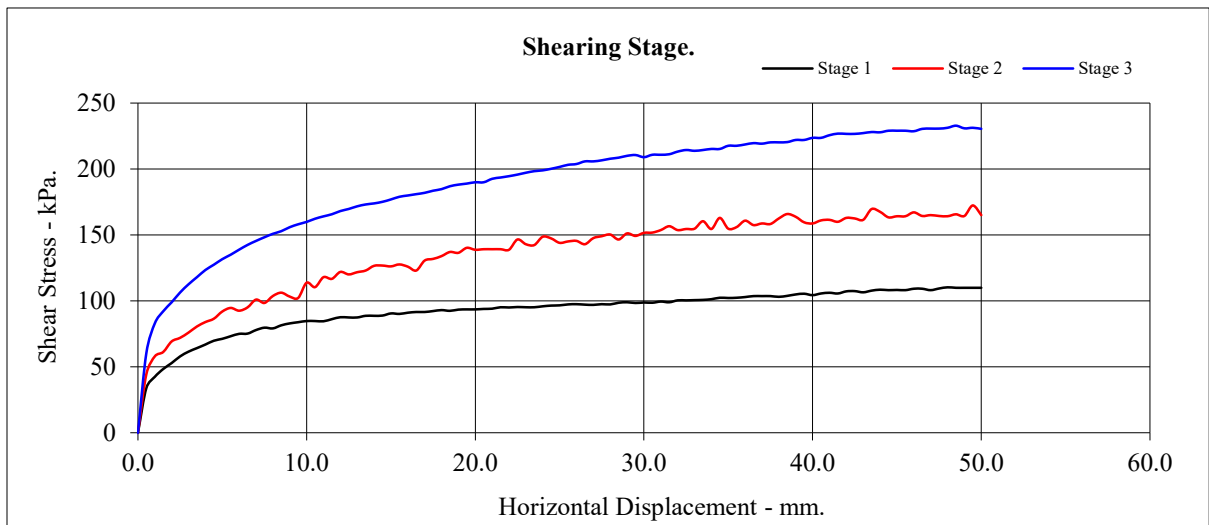
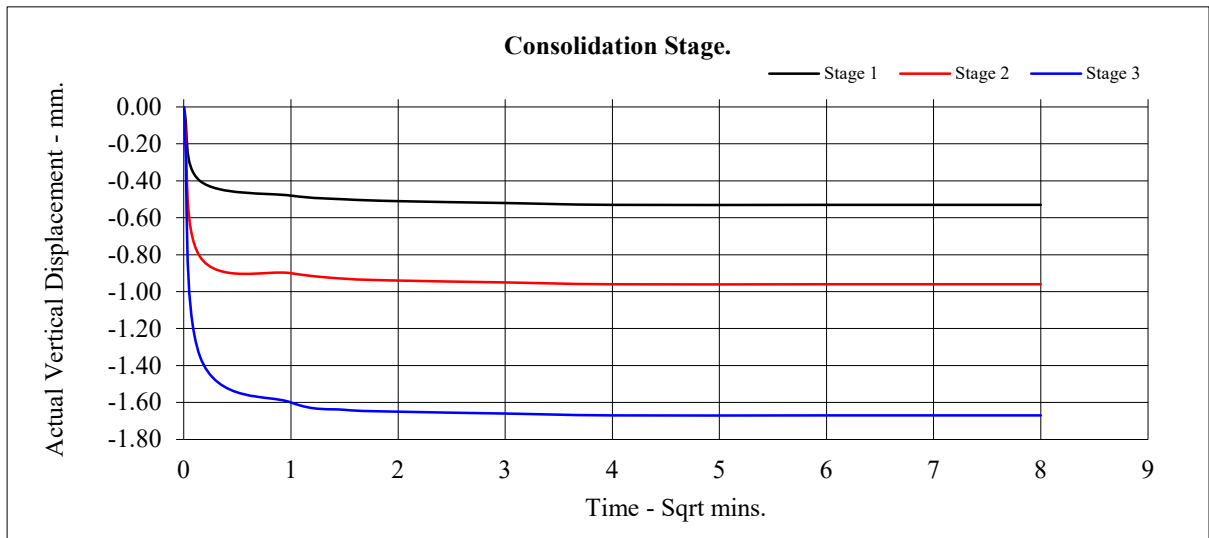
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CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 5

Hole Number:		Top Depth:	
Sample Number:	IMP - C 109	Base Depth:	



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