



Scottish & Southern Electricity Networks

LT307 – BRACO WEST
SITES 2 & 3

REPORT ON GROUND INVESTIGATION

Client:

**Scottish & Southern Electricity
Networks**

Consulting Engineers:

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LT307 – BRACO WEST SITES 2 & 3

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For and on Behalf of Raeburn Drilling and Geotechnical Limited Trading as Igne

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SCOTTISH & SOUTHERN ELECTRICITY NETWORKS

LT307 – BRACO WEST

SITES 2 & 3

REPORT ON GROUND INVESTIGATION

Contract No. 26555

26 January 2024

1. INTRODUCTION

Scottish & Southern Electricity Networks has proposed to construct a new 400kV substation west of the village of Braco within Perth and Kinross. On the instructions of SLR Consulting Ltd, Consulting Engineers to Scottish & Southern Electricity Networks (SSEN), and to their specification, an investigation was carried out to provide information on the ground conditions for design and construction of the proposed works and any geochemical contamination of the site. A factual report only was requested.

The comments given in this report and any opinions expressed therein are based on the ground conditions encountered during the site work, on the results of any in-situ or laboratory testing and any professional third party input. Whilst every effort has been made to ensure the accuracy of the data supplied and any analysis or interpretation derived from it, the possibility exists of variations in the ground, ground-water and ground gas conditions around, below and between the extent of the exploratory positions. No liability can be accepted for any such variations in these conditions. Furthermore, any recommendations are specific to the development as detailed in this Report and no liability will be accepted should they be used for the design of alternative schemes, by third parties, without prior consultation with Raeburn Drilling & Geotechnical Limited trading as Igne.

2. LOCATION OF SITE

The site of the proposed 400kV substation is located within an area of forestry land comprising of mature and semi mature trees on the eastern slopes of Feddal Hill located approximately 5.0km west of Braco Village, Perth and Kinross. Due to two

substation sites being proposed as part of the ground investigation these are centred at the following National Grid References Site 2 NN791089 and Site 3 NN787091.

Both Braco West substations sites are located within an area of existing forestry land, these are both located to the southwest of the existing Braco West Substation (275kV) with overhead electricity cables of the Beaulay to Denny line. The overhead cables bisect the site in northeast to south west direction forming the two areas of the proposed substation plots.

A plan showing the approximate location of the site is given in Figure A1 in Appendix A.

3. GROUND INVESTIGATION

3.1 Site Work

The site work was carried out during the period 15th November to 8th December 2023, in accordance with the guidelines laid down in EN1997-2:2007 (Ref.1), BS5930 (Ref.2), BS10175 (Ref.3) and in-house procedures. The results of the site work are given in Appendix B. A schedule of the site works is presented as Figure B0.

Fourteen boreholes were sunk by sonic and rotary core drilling methods with three boreholes were sunk continuous percussion utilising a dynamic sampler and rotary core drilling methods. Twenty trial pits were excavated by mechanical means, at the positions shown on the site plan (Fig. A2 in Appendix A). The depths of the boreholes and trial pits, the descriptions of the strata encountered and comments on the ground-water conditions are given in the borehole and trial pit records (Figs. B1 to B38). The positions and depths of the boreholes and trial pits were determined by the Consulting Engineers and Client and were set out on site by Raeburn Drilling & Geotechnical Limited trading as Igne in conjunction with the Consulting Engineers and Client.

Approximately 4600 peat probes were undertaken across the site over Braco site 2 and site 3 locations. These results have been reported under separate cover as an excel file. During the ground investigation the scope was modified to reflect the deep peat conditions encountered at Braco West 3, this resulted in new borehole locations with the postfix NEW as noted on Appendix A2 Site Plan.



Disturbed and 100mm diameter tube samples were taken at the depths shown on the borehole and trial pit records and were despatched, together with the rock cores, to the depot at Hamilton for examination and storage. Geochemical soil samples were taken directly into tubs. Samples for volatiles analysis were taken into vials, filling the container completely such that no voids were present. Geochemical samples were stored on site and transported to the laboratory in coolboxes. Each sample was uniquely identified and a transmittal note system used throughout sample transfer.

Photographs were taken of the sonic soil samples and rock core from the boreholes these are presented as Figures C1 to C17. Trial pits and associated spoil heaps is presented as Figures C18 to C38.

Standard (split-barrel sampler and cone) penetration tests (Ref.4) were made to assess the relative density of the materials encountered. The values of penetration resistance, given in the borehole records, are not corrected for energy ratio, or in any other way. The references to relative density under the heading "Description of Strata" in the borehole records are based on the field values of penetration resistance uncorrected for the effects of overburden pressure. Three sets of equipment were used for the tests and the Hammer Energy Test Reports are presented as Figures H1 to H3. Which set was used in each borehole is noted in the "Remarks" section of the borehole record.

Dynamic Cone Penetrometer (DCP) tests (Ref. 14) were undertaken adjacent to 10 no Trial pit locations (see Fig. B0). The results are given in Report A15044 in Appendix D, which include plots of cumulative blow count against depth and California bearing ratio (CBR) against depth.

Soakaway tests (Ref.7) were undertaken in four trial pits, located within the proposed Braco West 2 Substation area. The results are given as Report A15044 in Appendix D.

A nominal 50mm diameter perforated standpipe was installed in each of required boreholes as specified by SLR, details of which are given on the relevant records. Tests were subsequently carried out to determine the methane, carbon dioxide, carbon monoxide, hydrogen sulphide and oxygen contents of the gas in the standpipes. In addition, water level readings were taken in the instruments. The results of the monitoring are given in Figure E1.

During the end of the sitework period on the 11th December 2023, the standpipes in boreholes BH01, BH02, BH04, BH07, BH10, BH11NEW, BH13, BH14NEW & BH19 were purged of three well volumes to develop the installations. Thereafter, water samples were taken by bailer/Waterra, before being / transferred to one litre glass and plastic bottles. The water samples were delivered to the laboratory in coolboxes.

The ground levels and co-ordinates at the borehole and trial pit positions, given on the records, were determined using a Global Positioning System and are related to Ordnance Datum and the National Grid, respectively.

3.2 Laboratory Testing

Individual testing schedules were submitted to SLR the Consulting Engineers for scheduling as per their preference, completed schedules were forwarded to the testing laboratory. The laboratory testing was carried out by Terra Tek Limited (trading as Igne) who hold UKAS Accreditation for the scheduled tests.

The geotechnical laboratory testing was carried out in accordance with the referenced testing procedures given below. The results are given in Appendix F and comprised the following: these have been reported as per schedule so current figure locations are not noted as there are multiple locations over the results pages.

Description of Test	Figures	Ref
Moisture Content Tests		(5)/(13)
Liquid and Plastic Limit Tests		(13)
Bulk Density		(13)
Particle Size Distribution Tests		(13)
Moisture Condition Value		(5)
California Bearing Ratio		(5)
Small Shearbox Testing		(5)
Los Angeles Testing		(11)
Point Load Testing		(12)
Unconfined Compressive Strength		(10)

To date we have a number of geotechnical tests due to be reported through by the laboratory these include testing schedules 14 (TP07, TP13), schedule 15 (TP10

NEW, 11NEW, 12NEW) & Schedule 17(BH10) with the remaining rock testing results including geochemical testing results from subcontract laboratory.

BRE (Ref. 8) suite SD1 tests were undertaken on geotechnical samples from across the site. The SD1 results are reported as per each testing schedule set of results.

In addition, chemical contamination testing was carried out on 19 samples of made ground and soil. The results are given in Appendix G and are included in laboratory Report Reference 23-28085, 23-28676 & r23-28678. The testing comprised the following suite:

Description of Test

Metals (Arsenic, Boron, Cadmium, Chromium Total, Copper, Lead, Mercury, Nickel & Zinc)

pH and Sulphate

Organic Matter

Total Organic Carbon

TPHCWG Aliphatic/Aromatic Split

Polyaromatic Hydrocarbons (PAH) (USEPA 16)

Phenol

Cyanide Total

Asbestos Screen / Identification

Waste Acceptance Criteria



Senior Engineering Geologist

Chief Engineer

**For and on Behalf of Raeburn Drilling and Geotechnical Limited Trading as Igne
Ground Investigation Department
Hamilton**

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REFERENCES

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- (2) BS5930:2015+A1:2020: Code of Practice for Ground Investigations, British Standards Institution, 2020.
- (3) BS10175: Code of Practice for the Investigation of Potentially Contaminated Sites, British Standards Institution, 2011 + A1:2013.
- (4) BS EN ISO 22476-3: Geotechnical investigation and testing. Field testing. Standard penetration test, 2005.
- (5) BS1377 : Methods of Test for Soils for Civil Engineering Purposes, British Standards Institution, 1990.
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- (8) BRE Special Digest 1. Concrete in Aggressive Ground. Building Research Establishment. 2005.
- (9) Suggested Method for Determining Point Load Strength, International Society for Rock Mechanics, Commission on Testing Methods, Int. J Rock Mech. Min. Sci. and Geomech. Abstr., Vol. 22, 1985.
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- (14) Department of Transport. Specification for Highway Works. HMSO. 2006 Amendment.



Site: LT520 BRACO WEST SUBSTATION

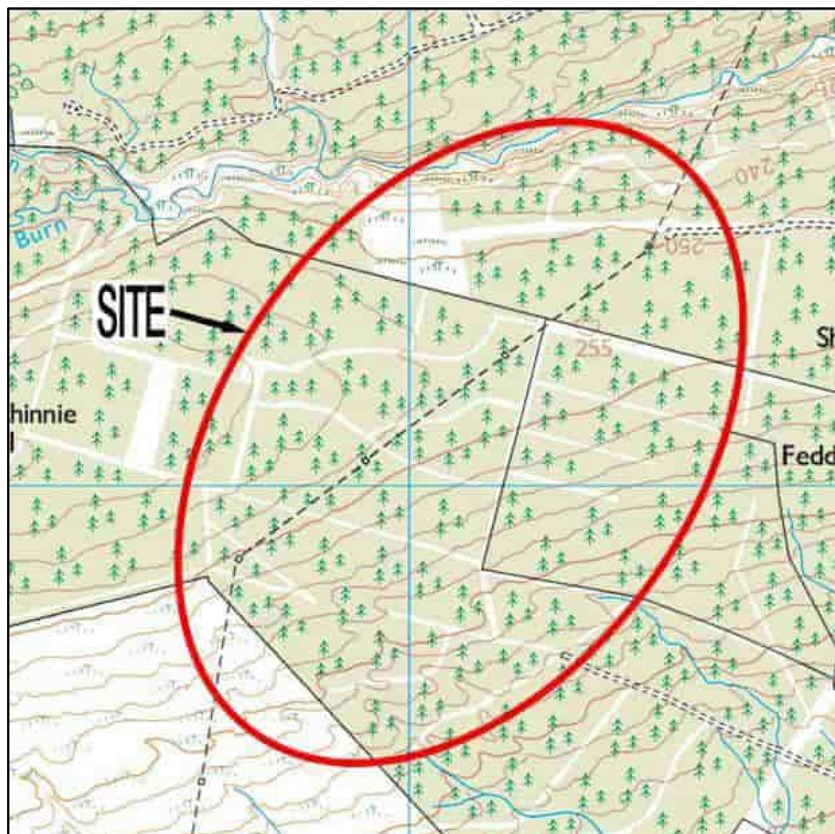
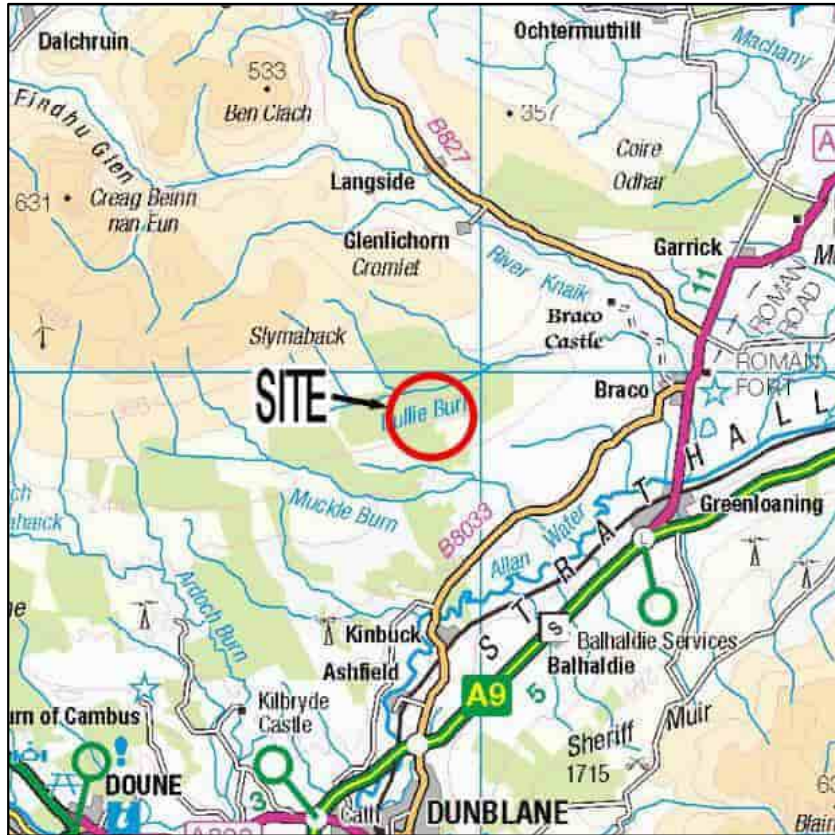
Contract No: 26555

Client: SHE Transmission plc

Engineer: SSE Perth Inveralmond HSE

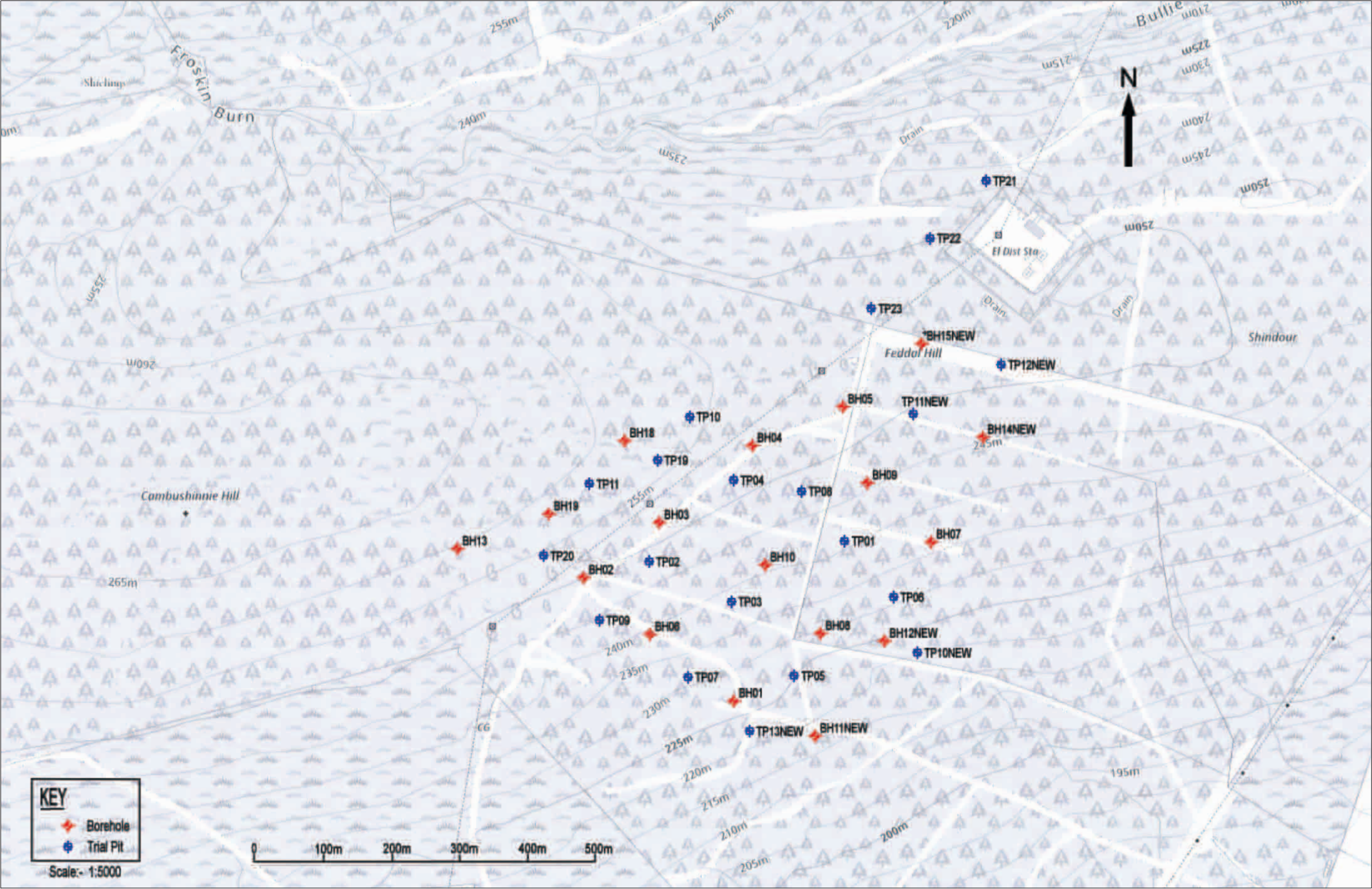
APPENDIX A
PLANS





Originator	RH	<p>Title:</p> <p>LOCATION PLAN</p>	<p>Fig No:</p> <p>A1</p>
Chk & App	Status		
FMR	Final		

Site: A3 SITE PLAN File: P:\GINTWP\PROJECTS\26555.GPJ Printed: 16/01/2024 15:03:56 Raaburn Drilling and Geotechnical Whistlary Rd, Hamilton ML9 0HP Tel: 01698 711177 Email: enquiries@raaburndrilling.com





Site: LT520 BRACO WEST SUBSTATION

Contract No: 26555

Client: SHE Transmission plc

Engineer: SSE Perth Inveralmond HSE

APPENDIX B
SITE WORKS



Boring

The standard method of boring in soil for ground investigation is known as the cable tool method. It uses various tools worked on a wire cable, typically a shell in non-cohesive soils such as sand and gravel, and a clay cutter in cohesive soils such as clay. Very dense soils, boulders or other hard obstructions are disturbed or broken up by chiselling and the fragments removed with the shell. Where the ground conditions require, the borehole is lined with driven steel casings of such sizes that the bottom of the borehole is not less than 125mm diameter.

Where there are constraints upon access, alternative methods of soft ground boring are available. However, each has limitations that need to be taken into account when assessing their suitability and the ground conditions inferred from their results.

Rotary Drilling

Rotary drilling is employed to extend ground investigation beyond the practical limit of cable tool boring in hard formations, commonly rock. Core drilling is used to obtain continuous intact samples of the formation and is generally undertaken with double tube swivel type core barrels fitted with tungsten or diamond bits as appropriate to formation type and hardness. Open-hole rotary drilling using tricone rock roller bits or tungsten insert drag bits, or down-the-hole hammers, is carried out where more limited information is sufficient, strata identification being made from cuttings only. Open-hole rotary drilling methods may also be employed for fast penetration of soils where detailed sampling is not required, prior to coring at depth. Air or water is the flushing medium normally used with rotary drilling methods. Where the ground conditions require, the borehole is lined with inserted or drilled-in casing. Rotary percussion allows dynamic sampling within soils.

Sonic Drilling

Sonic drilling is employed as an alternative boring method for soft ground and rock. The sonic rig operates much like any conventional top-drive rotary rig. The main difference is that a sonic drill rig has a specially designed hydraulically powered drill head or oscillator which produces adjustable high frequency vibratory forces. Sonic samples are extruded direct to plastic liner bags or semi-rigid plastic liners for rapid inspection. Bulk and small disturbed samples are then taken from the plastic liner bags.

Trial Pits

Trial pits are excavated by hand or machine for a number of purposes such as avoiding services, exposing foundations or obtaining a better view of shallow ground conditions.

Samples and In-situ Tests

Tube samples of cohesive soils are generally taken with a 100mm internal diameter open drive sampler known as a U100, with an area ratio of 30%. The sampler is driven into the soil at the bottom of the borehole by a sliding hammer. After a sample is taken, the drive head and cutting shoe are unscrewed from the sample tube and any wet or disturbed soil removed from either end. The sample tube is then sealed with wax and fitted with plastic end caps.

A range of more specialised equipment, e.g. thin walled open drive sampler (UT100), piston or foil samplers, may be used to obtain higher quality samples in conditions where conventional open drive sampling is impracticable or unsatisfactory. The UT100 sampler is specifically utilised to obtain class 1 samples of cohesive soils as required under BS EN1997-2.

Disturbed samples are taken from the boring tools or trial pits at regular intervals. The samples are sealed in airtight containers. Bulk samples are large disturbed samples from the boring tools, or from trial pits, generally where tube samples are unavailable.

The Standard Penetration Test, SPT, in accordance with BS EN ISO 22476-3, determines the resistance of soil to the penetration of a split barrel sampler. A 50mm diameter split barrel sampler is driven 450mm into the soil using a 63.5kg hammer with a 760mm drop, and the penetration resistance, the "N" value, is expressed as the number of blows required to achieve 300mm penetration below an initial penetration of 150mm, the seating drive, through any disturbed soil at the bottom of the borehole.

In coarse soils, the Cone Penetration Test (CPT) is conducted in the same manner as the SPT but using a 50mm diameter 60 degree apex solid cone point to replace the split barrel sampler.

Peat Probing

Generally, peat probing is carried out using a Mackintosh Probe. The probe is pushed through the peat until resistance is met then the depth at which this occurred is recorded.

Groundwater

Borehole water levels are recorded, together with the depths at which seepages or inflows of groundwater are detected and the observations noted on the borehole or trial pit records. These observations may not give an accurate indication of groundwater conditions, for the following reasons:

- The trial pit or borehole is rarely left standing at the relevant depth for sufficient time for the water level to reach equilibrium.
- A permeable stratum may have been sealed off by the borehole casing.
- It may have been necessary to add water to the borehole to facilitate progress.
- There may be seasonal, tidal or other effects at the site.

A more accurate record of groundwater behaviour may be obtained from standpipes or standpipe piezometers.

Gases

Determination and measurement of gases in the ground, commonly in relation to landfills, may be made directly from the ground surface, where a hole is formed by driving a solid and rigid steel spike to depths normally in the range 1.0 to 1.5m. Gas emissions are analysed using an appropriate portable analyser. However, research has shown that the small sample hole size and smearing effects can give a false negative result.

Where more accurate or longer term measurement of emissions is required, gas monitoring standpipes are installed in boreholes.

The following site tests are carried out following procedures set out in the listed standards.

TEST	STANDARD
CBR	BS 1377 : 1990
Data Loggers	BS EN ISO 22282
Ground Water Sampling	BS ISO 5667-1 : 2009
Hand Vanes	BS 1377 : 1990
Permeability Tests	BS EN ISO 22282-2-2012
Slug Tests	BS EN ISO 22282
Soakaway Tests	BRE Digest 365
Surface Water Sampling	BS ISO 5667-6 : 2009

SOIL SAMPLES

U (X) General purpose tube sample; X No of blows to drive sampler
Piston Piston sample

NOTE: Tube samples are 100mm diameter unless otherwise specified in the remarks. Suffix 'a' indicates sample not recovered; suffix 'b' indicates full penetration of sampler not obtained; suffix 'c' indicates full penetration of sampler but limited recovery

D/J/T/V Small Disturbed/Jar/Tub/Vial sample

B/LB Bag/Large Bag sample

UT (X) Thin walled push in sampler (type OS-T/W); X No of blows to drive sampler

ET Sample appropriate for geochemical analyses (tub)

CORE RECOVERY AND ROCK QUALITY

C Core Sample

TCR Total Core Recovery: The total core recovered expressed as a percentage of the core run length

SCR Solid Core Recovery: The core recovered as solid cylinders expressed as a percentage of the core run length

RQD Rock Quality Designation: The core recovered as solid cylinders of length 100mm or more expressed as a percentage of core run length.

RO-S/RO-R Rotary Open Hole Drilling through Soil / Rotary Open Hole Drilling through Rock

FI Fracture Index: The number of discontinuities expressed as fractures per metre

Flush "Depth" indicates depth down to which recorded "Returns" relate

NI Non Intact

NR No Recovery (assumed)

GROUND-WATER

W Water Sample

↕ Ground-water encountered

↕ Depth to which ground-water rose

↕ Ground-water cut off by the casing

WS Water Sample from Standpipe

IN SITU AND FIELD TESTS

SPT=X a/b (pen) Standard penetration test (split barrel sampler(SPT)or cone (CPT)); X is the penetration (N) value;

or CPT=X a/b (pen) 'a' is blow/75mm for seating drive; 'b' is blows/75mm for test drive; (pen) is test drive penetration if less than 300mm.

CBR California bearing ratio test

MCV Moisture condition value test

K Permeability test

HP Hand penetrometer test

FV Field vane test

HV Hand vane test (I = Initial, R = Residual)

ID Density test

PID Photo Ionisation Detector (ppm)

LEGENDS

Material legends are in accordance with ISO 710-1 and 710-2

before a description indicates that it is based on the Driller's record.

INSTALLATIONS (BACKFILL)



Concrete



Bentonite



Spoil



Bentonite/cement grout



Sand



Solid pipe



Gravel



Slotted pipe



Porous element



Wooden plug



Asphalt

DIMENSIONS

All dimensions in metres unless otherwise stated.

ROTARY DRILLING SIZES

Letter	Nominal Diameter (mm)	
	Borehole	Core
Standard		
N	76	54
H	100	76
P	121	92
S	146	113
Non-standard		
412	108	75

Other casing and borehole diameter sizes are available and may be used where required. Details will be on the individual BH logs.

Activity Type/Method Key

CC	Concrete Coring
COM	Rotary Percussion
CP	Cable Percussion (Shell and Auger)
CPT	Static Cone Penetration Test
DCP	Dynamic Cone Penetrometer
DP	Dynamic Cone Sampling
GBS	Geobor-S
HP	Hand Excavated Trial Pit
ICBR	In Situ CBR Test
IDEN	In Situ Density Test
IP	Inspection Pit
IRES	In Situ Resistivity Test
IVAN	In Situ Vane Test
MOSTAP	Monster Steek Apparaat
MP	Mackintosh Probe
PP	Peat Probe
RC	Rotary Coring
RO	Rotary Open Hole
RO-R	Rotary Open in Rock
RO-S	Rotary Open in Soils
SB	Sonic Boring
SC	Sonic Coring
SCP	Static Cone Penetrometer
SL	Sampling Location
SO	Sonic Open Holing
TP	Trial Pit/Trench
WLS	Dynamic (Windowless) Sampler
WS	Window Sampler

Style: SCHEDULE OF BH & TP File: P:\GINTWP\PROJECTS\26555.GPJ Printed: 26/01/2024 15:45:35 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com



Site: LT520 BRACO WEST SUBSTATION

Contract No: 26555



Client: SHE Transmission plc

Engineer: SSE Perth Inveralmond HSE

Exploration Point	Co-ordinates		Ground Level (mO.D.)	Method	Figure No	Installation	Remarks
	Easting (m)	Northing (m)					
BH01	279045.7	708752.2	227.89	IP+SB+GBS	BB1	1	
BH02	278817.0	708935.6	249.18	IP+SB+GBS	BB2	1	
BH03	278938.5	709019.0	250.98	IP+SB+GBS	BB3		
BH04	279075.4	709136.1	252.35	IP+SB+GBS	BB4	1	
BH05	279209.3	709189.4	252.35	IP+SB+GBS	BB5		
BH06	278918.1	708854.7	239.37	IP+RO+RC	BB6		
BH07	279345.8	708987.3	235.10	IP+SB+GBS	BB7	1	
BH08	279174.6	708851.6	228.66	IP+SB+GBS	BB8		
BH09	279245.7	709074.8	245.98	IP+SB+GBS	BB9		
BH10	279097.1	708955.4	240.05	IP+SB+GBS	BB10	1	
BH11 NEW	279166.5	708700.2	216.61	IP	BB11	1	
BH12 NEW	279276.4	708841.5	223.15	IP+SB+GBS	BB12		
BH13	278633.3	708981.5	259.53	IP+SB+GBS	BB13	1	
BH14 NEW	279416.7	709146.0	246.92	IP+RO+RC	BB14	1	
BH15 NEW	279328.4	709282.6	253.23	IP+SB+GBS	BB15		
BH18	278879.8	709141.7	258.49	IP+COM	BB16		
BH19	278769.3	709026.5	257.97	IP+SB+SC	BB17	1	
TP01	279216.2	708992.3	239.05	TP	BB18		
TP02	278914.8	708959.8	247.70	TP	BB19		
TP03	279042.2	708901.3	236.85	TP	BB20		
TP04	279045.9	709078.8	250.56	TP	BB21		
TP05	279135.1	708794.4	223.47	TP	BB23		
TP06	279286.2	708910.8	229.63	TP	BB24		
TP07	278976.9	708791.3	228.97	TP	BB25		
TP08	279149.9	709062.8	247.01	TP	BB26		
TP09	278842.5	708873.5	243.84	TP	BB27		
TP10	278982.3	709176.9	255.65	TP	BB28		
TP10 NEW	279320.5	708826.9	219.82	TP	BB29		
TP11	278832.8	709079.9	257.73	TP	BB30		
TP11 NEW	279319.6	709178.6	250.74	TP	BB31		
TP12 NEW	279448.5	709253.8	251.72	TP	BB32		
TP13 NEW	279072.2	708706.9	221.41	TP	BB33		
TP19	278933.5	709111.8	255.47	TP	BB34		
TP20	278760.5	708969.6	253.41	TP	BB35		
TP21	279425.0	709522.9	242.53	TP	BB36		
TP22	279338.8	709439.4	249.20	TP	BB37		
TP23	279253.9	709333.8	251.53	TP	BB38		

Originator RB	Title: SCHEDULE OF SITE WORKS		Fig No: B0 Sheet 1 of 1
Chk & App FMR			
Status Final			

Style: BOREHOLE NEW File: P:\GINTWP\PROJECTS\26555.GPJ+44 (0)1698 710999 Printed: 26/01/2024 13:25:48 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555							
				Client: SHE Transmission plc										BH01							
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Sonic Boring to Geobore-S to				1.20m 4.00m 10.55m			
Location: E 279045.7 N 708752.2				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush													
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata						Legend	Water Depth	Backfill			
	Depth	Type	Depth	Result														Symbol	Depth		
16/11			9.85			12	10.55	217.34	10.55	Medium strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Partially weathered. Recovered as Non-intact Medium strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with greenish grey with moderately weak mudstone pockets. Partially weathered to unweathered. Fractures are subhorizontal very closely to closely spaced planar to undulating smooth clean with localised gravel infill END OF BOREHOLE							3.10m		10.55		
Remarks:																Hole Diam.	To Depth				
# Description based on Driller's log.																	Boring	Casing			
An inspection pit was excavated by hand to a depth of 1.20m to clear services.																150	4.00	4.00			
No ground-water observations are recorded due to the use of water flush.																146	10.55	10.55			
The Penetration Tests were carried out using Trip Hammer RD54.																					
A 50mm diameter perforated standpipe was installed to a depth of 5.00m.																					
Driller S McL	Originator RB	Ground-water				Water Added		Chiselling			Flush					Fig No: B1 Sheet 2 of 2 Scale 1:50					
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)							
Chk & App	Status DRAFT										100	Water	1.20	7.00							

Client:	SHE Transmission plc
Engineer:	SSE Perth Inveralmond HSE

BH02

Inspection Pit to	1.20m
Geobore-S to	15.35m


Orientation: Vertical

Equipment: Hand Tools, Track Mounted Boart Longyear
LS250 Mini Sonic; Water Flush



Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill															
	Depth	Type	Depth	Result									Symbol	Depth														
17/11/2023	0.50 1.00-1.80 1.00 1.20-1.55 1.20 1.55-1.80	B, D B, D B, D B, D	1.20	SPT=22 0.1/1.5,8.8	TCR	SCR	RQD	FI	AZCL	249.18 247.98 247.63 247.38 246.88 246.48 246.18 245.38 244.68 243.28 243.18 242.18 241.58 240.88 240.08 239.88	1.20 1.55 1.80 2.30 2.70 3.00 3.80 4.50 5.90 6.00 7.00 7.60 8.30 9.10 9.30	Soft brown to dark brown spongy pseudo-fibrous PEAT Soft black plastic amorphorous to pseudo-fibrous PEAT greyish brown silty SAND & GRAVEL. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded of sandstone Assumed zone of core loss Weak to moderately strong reddish brown fine to medium grained SANDSTONE. Recovered as non-intact Moderately strong reddish brown fine to medium grained SANDSTONE. Fractures are subhorizontal very closely spaced planar to undulating smooth to rough clean with occasional clay smear Weak to moderately strong reddish brown fine to medium grained SANDSTONE. Recovered as non-intact Very weak to weak greyish brown MUDSTONE with reddish brown siltstone laminae. Distinctly to destructively weathered. Recovered as soft to firm greyish brown slightly sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular to subangular of mudstone and siltstone. Moderately strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Recovered as non-intact disorganised cobbles and gravel with some subvertical to oblique fractures noted in larger cobble sized fragments Very weak to weak greyish brown MUDSTONE with reddish brown siltstone laminae. Distinctly to destructively weathered. Recovered as soft to firm greyish brown slightly sandy gravelly clay Moderately weak to moderately strong reddish brown thinly to thickly laminated fine to medium grained SANDSTONE with thickly laminated interbedded mudstone. Recovered as non-intact unsorted cobbles and gravel with some clay smears Moderately strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with healed incipient fractures with calcite mineralisation. Fractures are subhorizontal very closely to closely spaced planar to undulating smooth clean with localised gravel infilled, occasional subvertical fracturing noted on refracturing on healed subvertical fractures Moderately strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Fracture Set 1: subhorizontal very closely to closely spaced planar to undulating smooth clean with localised gravel infilled. Fracture Set 2: Oblique to subvertical fracture planar to undulating rough with gravel infill Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with healed incipient fractures with calcite mineralisation. Fracture Set 1: subhorizontal very closely to medium spaced planar to undulating smooth to rough clean. Fracture Set 2: subvertical planar to undulating smooth clean with calcite mineralisation on fracture surfaces Assumed zone of core loss Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Fractures are subhorizontal very closely to medium spaced planar to undulating smooth to rough clean																
																1.80	60	10	0	NI	2.00							
																						3.30	100	0	0	NI	2.00	
																												4.80
					6.00	100	0	0	NA																			
																6.50	91	32	0	NI	2.00							
					7.60	100	67	0	23													2.00						
																9.10	83	58	0	AZCL	2.00							
					19																							

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
No ground-water observations are recorded due to the use of water flush.
The Penetration Tests were carried out using Trip Hammer RD48.
A 50mm diameter perforated standpipe was installed to a depth of 8.00m.


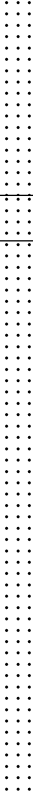
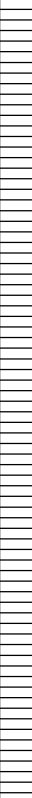

Hole Diam.	To Depth	
	Boring	Casing
150	1.80	1.80
146	15.35	15.35

Driller S McL	Originator RB	Ground-water				Water Added		Chiselling			Flush				Fig No:		
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)			
Chk & App	Status DRAFT											100	Water	1.20	1.80		B2 Sheet 1 of 2 Scale 1:50
												50	Water	1.80	10.30		
												100	Water	10.30	15.35		

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				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555			
				Client: SHE Transmission plc										BH02			
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Geobore-S to 1.20m 15.35m			
Location: E 278817.0 N 708935.6				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush									
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill				
	Depth	Type	Depth	Result									Symbol	Depth			
17/11			9.10				10.30	249.18	10.30	<p>Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with healed incipient fractures with calcite mineralisation. Fracture Set 1: subhorizontal very closely to closely spaced planar to undulating smooth to rough clean, locally gravel infilled. Fracture Set 2: subvertical planar to undulating rough clean with calcite mineralisation on fracture surfaces</p> <p>Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with healed incipient fractures with calcite mineralisation. Fractures are subhorizontal very closely to medium spaced planar to undulating smooth clean</p> <p>Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with healed incipient fractures with calcite mineralisation. Fractures are subhorizontal closely to medium spaced planar to undulating smooth clean</p> <p>Moderately strong to strong reddish brown thinly to thickly laminated fine to medium grained SANDSTONE with healed incipient fractures with calcite mineralisation. Recovered as non intact with subvertical fractures noted with calcite mineralisation on fracture surfaces</p> <p>Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with healed incipient fractures with calcite mineralisation. Fracture Set 1: subhorizontal closely to medium spaced planar to undulating smooth to rough clean, locally gravel infilled. Fracture Set 2: subvertical planar to undulating rough clean</p> <p>Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with healed incipient fractures with calcite mineralisation. Fractures are subhorizontal very closely to medium spaced planar to undulating smooth clean with localised gravel infilled</p>	8.70m 9.40m						
			10.30	100	80	30		10	238.88					10.30			
								8	238.48					10.70			
									237.88					11.30			
								8	236.58					12.60			
								NI	236.13					13.05			
								8	235.18					14.00			
			14.00	96	63	37		10									
20/11							15.35	233.83	15.35	END OF BOREHOLE					9.80m		15.35
Remarks:												Hole Diam.	To Depth				
# Description based on Driller's log.												150	Boring	Casing			
An inspection pit was excavated by hand to a depth of 1.20m to clear services.												146	15.35	15.35			
No ground-water observations are recorded due to the use of water flush.																	
The Penetration Tests were carried out using Trip Hammer RD48.																	
A 50mm diameter perforated standpipe was installed to a depth of 8.00m.																	
Driller S McL	Originator RB	Ground-water				Water Added		Chiselling			Flush					Fig No: B2 Sheet 2 of 2 Scale 1:50	
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)			
Chk & App	Status DRAFT										100	Water	1.20	1.80			
											50	Water	1.80	10.30			
											100	Water	10.30	15.35			

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				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555							
				Client: SHE Transmission plc										BH03							
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Sonic Boring to Geobore-S to 1.20m 2.70m 15.30m							
Location: E 278938.5 N 709019.0				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush													
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill								
	Depth	Type	Depth	Result									Symbol	Depth							
21/11			9.60				5	250.98		... between 10.05 and 10.10m mudstone band											
			11.10	100	73	63		NI	239.68	11.30					Weak to moderately weak thinly to thickly laminated reddish brown SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Recovered as non intact sandy very clayey gravel with cobbles noted. Medium strong to strong thinly to thickly laminated reddish brown SANDSTONE with thinly to thickly laminated mudstone bands. Partially weathered. Fracture Set 1: subhorizontal closely to medium spaced planar to undulating smooth clean. Fracture Set 2: oblique planar to undulating smooth clean.						
									239.38	11.60											
			12.60	100	90	87															
			14.10	100	75	58															
							2.70	235.68	15.30	END OF BOREHOLE					11.90m	15.30					
Remarks: # Description based on Driller's log. An inspection pit was excavated by hand to a depth of 1.20m to clear services. No ground-water observations are recorded due to the use of water flush. The Penetration Tests were carried out using Trip Hammer RD48.												Hole Diam.	To Depth								
												177 146	2.70 15.30	2.70							
Driller DJ	Originator RB	Ground-water				Water Added		Chiselling			Flush					Fig No: B3 Sheet 2 of 2 Scale 1:50					
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)							
Chk & App	Status DRAFT										100	Water	1.20	15.30							

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<div>RAEBURN DRILLING & GEOTECHNICAL LTD</div>				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555					
				Client: SHE Transmission plc										BH04					
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Sonic Boring to Geobore-S to				1.20m 2.70m 15.25m	
Location: E 279075.4 N 709136.1				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush											
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill						
	Depth	Type	Depth	Result									Symbol	Depth					
16/11 2023	0.50 1.00 1.20- 2.00 1.20 2.00- 2.70 2.00	B, D	1.20	SPT=12 2.3/2.3.3.4			0.00	252.35		Soft brown to dark brown spongy amorphous PEAT with cobbles noted. Cobbles are angular, up to 120mm of grey granite and psammite		2.20m 2.65m		0.10					
								251.80	0.55	Reddish brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is fine to coarse subrounded of sandstone				0.50					
								251.15	1.20	Medium dense reddish brown very sandy silty GRAVEL with low cobble content and occasional thickly laminated to thinly bedded silt lenses noted. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded of sandstone. Cobbles are angular to subangular of sandstone.				2.00					
								249.65	2.70	Weak to moderately weak thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with interbedded mudstone bands. Destructively weathered. Recovered as very sandy very clayey angular gravel and cobbles noted									
								248.35	4.00	Medium strong thinly to thickly laminate reddish brown fine to medium grained SANDSTONE. Fractures are subhorizontal closely spaced planar to undulating smooth clean Moderately weak to medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Distinctly weathered. Recovered as non intact									
								248.25	4.10										
								247.65	4.70	Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Fractures are subhorizontal very closely to medium spaced planar to undulating smooth to rough clean with localised gravel infill									
								247.15	5.20	Moderately weak to medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Distinctly weathered. Recovered as non intact									
								246.65	5.70	Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Fractures are subhorizontal closely to medium spaced planar to undulating smooth to rough clean with localised gravel infill									
								246.15	6.20	Weak to moderately weak thinly to thickly laminated greyish brown MUDSTONE. Distinctly to destructively weathered. Recovered as firm slightly sandy gravelly clay									
								245.65	6.70	Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Fracture Set 1: subhorizontal closely to medium spaced planar to undulating smooth to rough clean with localised gravel infill. Fracture Set 2: subvertical planar to undulating smooth clean									
								245.15	7.20	Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with occasional thinly laminated mudstone laminae. Fractures are subhorizontal closely to medium spaced planar to undulating smooth clean									
								243.75	8.60	Weak to moderately weak thinly to thickly laminated greyish brown MUDSTONE. Distinctly to destructively weathered. Recovered as firm slightly sandy gravelly clay Medium strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with occasional thinly laminated mudstone laminae. Fractures are subhorizontal very closely to medium spaced planar to undulating smooth clean.									
								243.45	8.90										
								242.47	9.88	Strong thinly to thickly laminated reddish brown fine to medium grained									
Remarks: # Description based on Driller's log. An inspection pit was excavated by hand to a depth of 1.20m to clear services. No ground-water observations are recorded due to the use of water flush. The Penetration Tests were carried out using Trip Hammer RD48. A 50mm diameter perforated standpipe was installed to a depth of 2.00m.													Hole Diam.	To Depth Boring	Casing				
													177	2.70	2.70				
													145	14.00					
Driller DJ	Originator RB	Ground-water				Water Added		Chiselling			Flush				RAEBURN	Fig No: B4 Sheet 1 of 2 Scale 1:50			
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)					
											100	Water	1.20	15.25					
Chk & App	Status DRAFT																		

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				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555							
				Client: SHE Transmission plc										BH05							
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Sonic Boring to Geobore-S to 1.20m 8.75m 15.75m							
Location: E 279209.3 N 709189.4				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush													
Progress 15/11/2023	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill								
	Depth	Type	Depth	Result										Symbol	Depth						
	0.50	B, D	1.20	SPT=10	1.2 / 2.2, 2.4			0.00	252.35		Soft brown to dark brown spongy pseudo-fibrous PEAT.			0.20							
	1.00	B, D							251.75	0.60	Brown to reddish-brown very gravelly silty fine to coarse SAND. Gravel is angular and sub-angular fine to coarse of sandstone										
	1.20-1.90	B, D							251.15	1.20	Firm reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subround of sandstone										
	1.90-2.00	B, D							250.45	1.90	Reddish brown very sandy silty GRAVEL. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded of sandstone										
									249.65	2.70	Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with thinly bedded mudstone beds. Fractures are horizontal very closely to closely spaced planar to undulating smooth clean with occasional clay infill										
											... between 3.40 and 3.48m firm reddish brown slightly sandy gravelly clay band noted										
											... between 3.60 and 3.74m firm reddish brown slightly sandy gravelly clay band noted										
											Assumed Zone of Core Loss										
											248.05			4.30							
											247.65			4.70	Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Fractures are horizontal very closely to closely spaced planar to undulating smooth clean with occasional clay infill						
					247.45	4.90	Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Recovered as a subangular to subrounded cobbles														
					246.95	5.40	Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Fracture Set 1: horizontal very closely to closely spaced planar to undulating smooth clean. Fracture Set 2: subvertical planar to undulating smooth to rough clean														
							... between 5.30 and 5.40m firm reddish brown slightly sandy gravelly clay band noted														
							Assumed Zone of Core Loss														
					246.40	5.95															
					246.30	6.05	Medium thinly to thickly laminated strong reddish brown fine to medium grained SANDSTONE. Partially weathered. Recovered as Non-intact														
					245.85	6.50	Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Partially weathered. Fracture Set 1: horizontal very closely to closely spaced planar to undulating smooth clean. Fracture Set 2: subvertical planar to undulating smooth to rough clean														
					245.45	6.90	Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Partially weathered. Fractures are horizontal closely spaced planar to undulating smooth clean with occasional clay infill														
					245.30	7.05	Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Partially weathered. Recovered as Non-intact														
							Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Partially weathered. Fractures are horizontal closely to medium spaced planar to undulating smooth clean														
					244.35	8.00	... between 7.90 and 7.95m 40 degree fracture planar to undulating smooth clean														
					243.95	8.40	Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Partially weathered. Fracture Set 1: horizontal closely to medium spaced planar to undulating smooth clean. Fracture Set 2: subvertical planar smooth to rough clean														
					243.60	8.75	Very weak reddish brown MUDSTONE. Distinctly weathered recovered as firm slightly sandy slightly gravelly clay														
					243.45	8.90	... between 8.50 and 8.75m greenish grey mottled noted.														
							Medium strong reddish brown and greenish grey fine to medium grained SANDSTONE with mudstone laminae. Fractures are horizontal very closely to closely spaced planar to undulating smooth clean with occasional clay infill														
							Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Partially weathered. Fractures are horizontal very closely to closely spaced planar smooth clean with occasional clay infill														
							... between 9.30 and 9.35m firm reddish brown slightly sandy gravelly clay band noted														
Remarks:												Hole Diam.		To Depth							
# Description based on Driller's log.												177		Boring							
An inspection pit was excavated by hand to a depth of 1.20m to clear services.												146		Casing							
No ground-water observations are recorded due to the use of water flush.																					
The Penetration Tests were carried out using Trip Hammer RD48.																					
Driller DJ	Originator RB	Ground-water				Water Added		Chiselling			Flush					Fig No: B5 Sheet 1 of 2 Scale 1:50					
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)							
Chk & App	Status DRAFT										100	Water	1.20	15.75							

Orientation: Vertical

Equipment: Hand Tools, Track Mounted Commachio Geo
205



[illegible]

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
No ground-water observations are recorded due to the use of water flush.
The Penetration Tests were carried out using Trip Hammer RD70.

Hole Diam.	To Depth	
	Boring	Casing
130	10.00	3.00

Driller PS	Originator RB	Ground-water				Water Added		Chiselling			Flush				RAE BURN	Fig No:
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)		
Chk & App	Status DRAFT											100 100	Air AirWM	1.20 3.00 3.00	3.00 6.00	B6 Sheet 1 of 2 Scale 1:50

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				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555					
				Client: SHE Transmission plc										BH06					
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to 1.20m Rotary Open Hole to 3.00m Rotary Core Drilling to 10.00m					
Location: E 278918.1 N 708854.7				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Commachio Geo 205											
Progress	Samples		Tests		Casing Depth	Level (mOD) 239.37	Depth	Description of Strata								Legend	Water Depth	Backfill	
	Depth	Type	Depth	Result														Symbol	Depth
								medium grained SANDSTONE with many thinly to thickly laminated mudstone bands. Unweathered. Fractures are subhorizontal very closely to closely spaced planar to undulating smooth clean with localised gravel infilled											
								END OF BOREHOLE											
Remarks:																Hole Diam.	To Depth		
# Description based on Driller's log. An inspection pit was excavated by hand to a depth of 1.20m to clear services. No ground-water observations are recorded due to the use of water flush. The Penetration Tests were carried out using Trip Hammer RD70.																130	Boring	Casing	
Driller PS		Originator RB		Ground-water				Water Added		Chiselling			Flush					Fig No: B6 Sheet 2 of 2 Scale 1:50	
				Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)			
Chk & App		Status DRAFT											100 100	Air AirWM	1.20 3.00	3.00 6.00			



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<div>RAEBURN</div> <div>DRILLING & GEOTECHNICAL LTD</div>				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555			
				Client: SHE Transmission plc										BH08			
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Sonic Boring to Geobore-S to			
Location: E 279174.6 N 708851.6				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush									
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill				
	Depth	Type	Depth	Result									Symbol	Depth			
27/11 2023							228.66		Soft brown to dark brown spongy amorphous PEAT.								
	0.50	B, D															
	0.90	B, D					227.76	0.90									
	1.20	B	1.20	CPT>50 7.18 /19.31 (85)				0.00	227.46	1.20	Brown very gravelly silty fine to coarse SAND. Gravel is fine to coarse angular to subangular of sandstone.						
	2.00	B							Very dense rown very sandy silty GRAVEL with cobbles noted. Sand is fine to coarse. Gravel is fine to coarse angular of sandstone. Cobbles are angular, up to 150mm of sandstone.								
				TCR	SCR	RQD	FI		225.96	2.70							
			2.70	69	15	0		AZCL			Assumed Zone of Core Loss						
								NA			Weak reddish brown SANDSTONE. Destructively weathered. Recovered as sandy very clayey angular fine to coarse gravel of sandstone with cobbles noted						
			4.00	100	73	30			224.36	4.30							
								10			Medium strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with interbedded thinly to thickly laminated mudstone laminae. Fractures are subhorizontal very closely to medium spaced planar to undulating smooth clean and locally gravel infilled ... between 4.90 and 5.50m subvertical fracture planar to undulating smooth to rough clean.						
			5.50	100	90	73			223.16	5.50							
								7			Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with interbedded thinly to thickly laminated mudstone laminae. Fractures are subhorizontal very closely to medium spaced planar to undulating smooth clean and locally gravel infilled						
			7.00	100	90	90			221.66	7.00							
			8.50	93	87	58		6			Strong thickly laminated to thinly bedded greyish brown fine to coarse grained SANDSTONE with occasional cross bedding noted. Fractures are subhorizontal closely to medium spaced planar to undulating smooth clean						
27/11							2.70		218.66	10.00							
Remarks:												END OF BOREHOLE					
# Description based on Driller's log. An inspection pit was excavated by hand to a depth of 1.20m to clear services. No ground-water observations are recorded due to the use of water flush. The Penetration Tests were carried out using Trip Hammer RD48.												Hole Diam.	To Depth				
												177 146	Boring 2.70 10.00	Casing 2.70			
Driller DJ	Originator RB	Ground-water				Water Added		Chiselling			Flush				RAEBURN	Fig No:	
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)		B8	Sheet 1 of 1
Chk & App	Status DRAFT										100	Water	1.20	10.00		Scale 1:50	



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<div>RAEBURN</div> <div>DRILLING & GEOTECHNICAL LTD</div>				Site: LT520 BRACO WEST SUBSTATION						Contract No: 26555														
				Client: SHE Transmission plc						BH09														
				Engineer: SSE Perth Inveralmond HSE						Inspection Pit to Sonic Boring to Geobore-S to				1.20m 4.05m 10.05m										
Location: E 279245.7 N 709074.8				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush																
Progress 22/11 2023	Samples		Tests				Casing Depth	Level (mOD) 245.98	Depth	Description of Strata	Legend	Water Depth	Backfill											
	Depth	Type	Depth	Result									Symbol	Depth										
	0.50 1.00 1.20- 2.70 2.00	B, D B, D B B, D	1.20	CPT>50	19.6 (75)/50 (5)	0.00	245.98		Soft brown to dark brown spongy amorphous PEAT					0.20										
							245.43	0.55	Soft brown to reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse angular of sandstone															
							244.88	1.10	Reddish brown silty fine to coarse SAND & GRAVEL with cobbles noted. Gravel is fine to coarse subangular to subrounded of sandstone and quartz. Cobbles are angular to subrounded of sandstone															
							243.28	2.70	Weak reddish brown SANDSTONE. Destructively weathered. Recovered as sandy very clayey angular fine to coarse gravel of sandstone with cobbles noted															
							242.98	3.00	Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with interbedded thinly to thickly laminated mudstone laminae. Partially weathered. Fractures are subhorizontal very closely to medium spaced planar to undulating smooth clean and locally gravel infilled															
							241.93	4.05	Weak reddish brown SANDSTONE with interbedded mudstone lenses. Destructively weathered. Recovered as sandy very clayey angular fine to coarse gravel of sandstone with cobbles noted. Occasional core with subvertical fractures noted															
							241.63	4.35	Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with interbedded thinly to thickly laminated mudstone laminae. Partially weathered. Fractures are subhorizontal closely to medium spaced planar to undulating smooth clean and locally gravel infilled															
							241.08	4.90	Weak reddish brown SANDSTONE with interbedded mudstone lenses. Destructively weathered. Recovered as sandy very clayey angular fine to coarse gravel of sandstone with cobbles noted. Occasional core with subvertical fractures noted															
							240.03	5.95	Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with interbedded thinly to thickly laminated mudstone laminae. Partially weathered to unweathered. Fractures are subhorizontal closely to widely spaced spaced planar to undulating smooth clean and locally clay infilled															
							239.03	6.95	Weak reddish brown SANDSTONE with interbedded mudstone lenses. Destructively weathered. Recovered as sandy very clayey angular fine to coarse gravel of sandstone with cobbles noted. Occasional core with subvertical fractures noted															
							238.93	7.05	Strong thinly to thickly laminated greyish brown SANDSTONE with thickly lmainited interbedded siltstone. Partially weathered to unweathered. Fractures are subhorizontal very closely to medium spaced planar to undulating smooth to rough clean and locally gravel infilled															
							236.53	9.45	Medium strong to strong thinly to thickly reddish brown laminated fine to medium grained SANDSTONE with some intercalation of thickly laminated light greenish grey mudstone lenses. Partially weathered to unweathered. Fractures are subhorizontal very closely to closely spaced planar to undulating smooth clean with localised gravel infill															
							Remarks: # Description based on Driller's log. An inspection pit was excavated by hand to a depth of 1.20m to clear services. No ground-water observations are recorded due to the use of water flush. The Penetration Tests were carried out using Trip Hammer RD54.												Hole Diam.	To Depth Boring Casing				
												177 146	2.70 10.05	2.70										
Driller DJ	Originator RB	Ground-water				Water Added		Chiselling			Flush				RAEBURN	Fig No: B9 Sheet 1 of 2 Scale 1:50								
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)										
											100	Water	1.20	10.05										
Chk & App	Status DRAFT																							

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				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555							
				Client: SHE Transmission plc										BH09							
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Sonic Boring to Geobore-S to				1.20m 4.05m 10.05m			
Location: E 279245.7 N 709074.8				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush													
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata						Legend	Water Depth	Backfill			
	Depth	Type	Depth	Result														Symbol	Depth		
							245.98	10.05	END OF BOREHOLE									10.05			
Remarks:														Hole Diam.		To Depth					
# Description based on Driller's log. An inspection pit was excavated by hand to a depth of 1.20m to clear services. No ground-water observations are recorded due to the use of water flush. The Penetration Tests were carried out using Trip Hammer RD54.														177 146		2.70 10.05		2.70			
Driller DJ	Originator RB	Ground-water				Water Added		Chiselling			Flush					Fig No: B9 Sheet 2 of 2 Scale 1:50					
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)							
Chk & App	Status DRAFT										100	Water	1.20	10.05							

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				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555									
				Client: SHE Transmission plc										BH12 NEW									
				Engineer: SSE Perth Inveralmond HSE																			
Location: E 279276.4 N 708841.5				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush										Inspection Pit to Sonic Boring to Geobore-S to				1.20m 2.70m 10.85m	
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata						Legend	Water Depth	Backfill					
	Depth	Type	Depth	Result														Symbol	Depth				
			9.35					223.15			END OF BOREHOLE												
								212.30	10.85														
Remarks:																		Hole Diam.	To Depth				
# Description based on Driller's log.																			Boring	Casing			
An inspection pit was excavated by hand to a depth of 0.70m to clear services. Exemption number																		177	2.70	2.70			
No ground-water observations are recorded due to the use of water flush.																		146	10.85				
Driller DJ	Originator RB	Ground-water				Water Added		Chiselling			Flush					Fig No: B12 Sheet 2 of 2 Scale 1:50							
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)									
Chk & App	Status DRAFT										100	Water	0.70	10.85									

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<div>RAEBURN</div> <div>DRILLING & GEOTECHNICAL LTD</div>				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555							
				Client: SHE Transmission plc										BH13							
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Sonic Boring to Geobore-S to				1.20m 4.20m 10.00m			
Location: E 278633.3 N 708981.5				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush													
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill								
	Depth	Type	Depth	Result									Symbol	Depth							
20/11 2023	0.50	B, D						1.20	259.53		Soft brown to dark brown spongy amorphous PEAT	Dry		0.50							
1.20- 2.70 1.20	B UT						258.33		1.20	Very soft black to dark brown plastic amorphous PEAT	1.50										
1.65	D						257.53		2.00												
2.00- 3.80	B, D						257.23		2.30	Soft to firm brown grey mottled slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded of sandstone	2.80										
2.70- 3.80 2.70	B, D	2.70	SPT=28	1.2	5.5	12.6	2.70			Medium dense brown very gravelly clayey fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular to subangular of sandstone	3.80										
3.80- 3.80	B						255.73		3.80												
			TCR	SCR	RQD	FI	255.33		4.20	Brown very gravelly very clayey fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone											
		4.20	100	27	0		5.70			Weak reddish brown SANDSTONE. Destructively weathered. Recovered as sandy very clayey angular fine to coarse gravel of sandstone with cobbles noted											
							253.63		5.90												
21/11			5.70	100	0	0	5.70			Weak to moderately weak reddish brown SANDSTONE Distinctly weathered. Recovered as non-intact with occasional clay bands											
							252.83	6.70													
							252.33	7.20	Medium strong to strong thickly laminated to thinly bedded greyish brown fine to medium grained SANDSTONE. Fractures Set 1: subhorizontal very closely to closely spaced planar to undulating smooth clean and gravel infilled. Fracture Set 2: subvertical planar to undulating smooth clean ...between 7.20 and 7.40m subvertical fracture planar rough clean, with calcite mineralisation												
			7.20	100	27	13	14		Medium strong thickly laminated to thinly bedded reddish brown fine to medium grained SANDSTONE healed subvertical fractures with calcite mineralisation noted. Fractures Set1: subhorizontal very closely to closely spaced planar to undulating smooth clean and gravel infilled. Fracture Set 2: subvertical planar to undulating smooth clean												
			8.70	100	77	23	14		... between 8.40 and 8.70m subvertical fractureplanar rough clean, with calcite mineralisation												
22/11								10.00	249.53	10.00		5.10m	10.00								
Remarks:												END OF BOREHOLE		Hole Diam.	To Depth						
# Description based on Driller's log.												177	1.80	4.20							
An inspection pit was excavated by hand to a depth of 1.20m to clear services.												145	10.00	10.00							
No ground-water observations are recorded due to the use of water flush.																					
The Penetration Tests were carried out using Trip Hammer RD54.																					
Driller S McL	Originator RB	Ground-water				Water Added		Chiselling			Flush				RAEBURN	Fig No: B13 Sheet 1 of 1 Scale 1:50					
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)							
											100	Water	1.20	4.20							
											100	Water	4.20	5.70							
Chk & App	Status DRAFT										100	Water	5.70	10.00							

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<div><div>RAEBURN</div><div>DRILLING & GEOTECHNICAL LTD</div></div>				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555																																																					
				Client: SHE Transmission plc										BH14 NEW																																																					
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Sonic Boring to Sonic Coring to				0.80m 2.70m 8.40m																																																	
Location: E 279416.7 N 709146.0				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush																																																											
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill																																																						
	Depth	Type	Depth	Result									Symbol	Depth																																																					
4/12 2023	0.50 0.80 1.20- 2.00 1.20 2.00- 2.70 2.00	B, D	1.20	SPT=24 7.12/8.7.5.4	1.20	TCR SCR RQD FI	8	246.92	0.20	Soft brown to dark brown spongy pseudo-fibrous PEAT		5.00m		0.50																																																					
04/12															10	246.72	0.20	Firm reddish brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subround and includes sandstone	0.50																																																
																				246.12	0.80	Brown to reddish brown slightly silty slightly sandy GRAVEL with cobbles noted. Sand is fine to coarse. Gravel is fine to coarse angular and sub-angular and includes sandstone. Cobbles are angular and sub-angular up to 90mm of sandstone	1.00																																												
																								245.72	1.20	Very weak brown to reddish brown SANDSTONE recovered as slightly gravelly silty fine to medium sand. Gravel is fine to coarse angular and includes sandstone	2.70																																								
																												244.22	2.70	Moderately weak to medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Fracture Set 1: subhorizontal to oblique very closely to closely spaced planar to undulating smooth clean and locally gravel infilled. Fracture Set 2: subvertical planar to undulating smooth clean	2.70																																				
																																243.32	3.60	Weak to moderately weak thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Recovered as sandy clayey gravel	2.70																																
																																				242.12	4.80	Moderately weak to medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Fractures are subhorizontal to oblique very closely to closely spaced planar to undulating smooth clean and locally gravel infilled.	2.70																												
																																								241.82	5.10	Weak to moderately weak thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Recovered as sandy clayey gravel	2.70																								
																																												241.52	5.40	Moderately weak to medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Fractures are subhorizontal to oblique very closely to closely spaced planar to undulating smooth clean and locally gravel infilled.	2.70																				
																																																241.22	5.70	Weak to moderately weak thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Recovered as sandy clayey gravel	2.70																
																																																				240.82	6.10	Medium strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with occasional healed fractures with calcite mineralisation. Fracture Set 1: subhorizontal very closely to medium spaced planar to undulating smooth clean. Fracture Set 2: subvertical planar to undulating smooth clean with occasional gravel infilled	2.70												
																																																								239.02	7.90	Weak to moderately weak thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Recovered as sandy clayey gravel	2.70								
																																																												238.92	8.00	Medium strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with occasional healed fractures with calcite mineralisation. Fractures are subhorizontal very closely to closely spaced planar to undulating smooth clean.	2.70				
																																																																238.62	8.30	Weak to moderately weak thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Recovered as sandy clayey gravel	2.70
	236.97	9.95	END OF BOREHOLE	9.95																																																															
Remarks: # Description based on Driller's log. An inspection pit was excavated by hand to a depth of 0.80m to clear services. Exemption number 76/2023. No ground-water observations are recorded due to the use of water flush. The Penetration Tests were carried out using Trip Hammer RD54.										Hole Diam.		To Depth Boring Casing																																																							
Driller SW					Originator RB	Ground-water				Water Added		Chiselling			Flush				RAEBURN	Fig No: B14 Sheet 1 of 1 Scale 1:50																																															
						Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)																																																	
Chk & App					Status DRAFT										100	Water	0.80	8.40																																																	

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<div>RAEBURN</div> <div>DRILLING & GEOTECHNICAL LTD</div>				Site: LT520 BRACO WEST SUBSTATION										Contract No: 26555							
				Client: SHE Transmission plc										BH18							
				Engineer: SSE Perth Inveralmond HSE										Inspection Pit to Rotary Open Hole to Rotary Core Drilling to				1.20m 3.20m 10.00m			
Location: E 278879.8 N 709141.7				Orientation: Vertical				Equipment: Hand Tools, Track Mounted Commachio Geo 205													
Progress	Samples		Tests				Casing Depth	Level (mOD)	Depth	Description of Strata	Legend	Water Depth	Backfill								
	Depth	Type	Depth	Result									Symbol	Depth							
30/11 2023	0.30	B, D						258.49		Soft brown to dark brown spongy amorphous PEAT				0.50							
29/11	1.20	D UL	1.20	SPT=13 2.3/3.3,4.3			0.00														
	2.20	D UL	2.20	SPT=17 3.3/4.4,5.4			2.20			256.59	1.90	Soft brown to reddish brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to coarse sub-angular to sub-rounded of sandstone and quartzite									
	3.20	D	3.20	SPT=48 3.5/7.11,13,17			2.20 3.20			255.29	3.20	# Driller Notes weathered red brown SANDSTONE.		0.00m							
				TCR	SCR	RQD	FI			254.49	4.00	Moderately weak to medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Recovered as non-intact sandy gravel									
							NI			253.59	4.90	Medium strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Distinctly weathered. Fractures are subhorizontal very closely to closely spaced planar to undulating smooth clean.									
							3			252.99	5.50	Moderately weak to medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly weathered. Recovered as non-intact sandy gravel									
							NI			252.89	5.60	Medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Fractures are subhorizontal medium spaced planar to undulating smooth clean									
										252.49	6.00	Moderately weak to medium strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with many thickly laminated mudstone bands. Distinctly to partially weathered. Recovered as non-intact sandy clayey gravel									
										251.79	6.70	Medium strong to strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE with may thinly to thickly laminated mudstone bands. Fractures are subhorizontal very closely to closely spaced planar to undulating smooth clean									
							8						... between 7.90 to 8.40m subvertical fracture planar to undulating rough with gravel infill.								
									249.99	8.50	Strong thinly to thickly laminated reddish brown fine to medium grained SANDSTONE. Fractures are subhorizontal closely to medium spaced planar to undulating smooth clean										
						4															
									248.49	10.00				10.00							
Remarks:														END OF BOREHOLE		Hole Diam.		To Depth			
# Description based on Driller's log. An inspection pit was excavated by hand to a depth of 1.20m to clear services. No ground-water observations are recorded due to the use of water flush. The Penetration Tests were carried out using Trip Hammer RD54.																130		10.00			
Driller PS		Originator RB		Ground-water				Water Added		Chiselling			Flush				RAEBURN		Fig No: B16 Sheet 1 of 1 Scale 1:50		
				Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)					
Chk & App		Status DRAFT											100 100 0	Air AirWM AirWM	1.20 4.00 5.00	3.20 5.00 10.00					

Orientation: Vertical

Equipment: Hand Tools, Track Mounted Boart Longyear
LS250 Mini Sonic; Water Flush

[illegible]





Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
No ground-water observations are recorded due to the use of water flush.
The Penetration Tests were carried out using Trip Hammer RD54.

Hole Diam.	To Depth	
	Boring	Casing
166	2.70	2.70
145	10.05	10.05


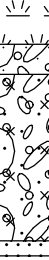


Driller	Originator RB	Ground-water				Water Added		Chiselling			Flush			
		Struck	Rose To	Time(min)	Cut Off	From	To	From	To	hh:mm	Returns	Type	From (m)	To (m)
Chk & App	Status DRAFT										100 0	Water Water	2.70 4.20	4.20 10.05

B17
Sheet 1 of 2
Scale 1:50









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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP01							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 1.10m							
Location: E 279216.2 N 708992.3				Orientation: Vertical				Equipment: 15T Tracked Excavator				Width - 1.30m Length - 4.00m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
21/11/2023	0.30	B, D			239.05		Soft brown to dark brown spongy amorphous PEAT		Dry						
	0.60	B, B, B, B, D			238.65	0.40	Brown to reddish brown very sandy silty GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse angular of sandstone. Cobbles are angular up to 140mm of sandstone								
	0.80	B			238.15	0.90									
				237.95	1.10	Medium strong brown grey SANDSTONE. Rock is slightly to moderately weathered and recovered as: gravelly silty fine to medium sand with high cobble content and medium boulder content. Gravel is fine to coarse angular and includes sandstone. Cobbles and boulders are angular, up to 480mm of sandstone									
							END OF TRIAL PIT								
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 1.10m due to hard digging (possible bedrock).															
Driller	Originator AD	Ground-water													
		Struck	Rose To	Time(mins)	Cut Off										
Chk & App	Status DRAFT														
								Fig No: B18 Sheet 1 of 1 Scale 1:50							

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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555		
				Client: SHE Transmission plc				Trial Pit No. TP02		
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 1.70m		
Location: E 278914.8 N 708959.8			Orientation: Vertical		Equipment: 14T Tracked Excavator			Width - 1.30m Length - 3.80m		
Progress	Sample Depth	Samples and Tests		Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill	
		Type	Result						Symbol	Depth
27/11/2023	0.20	B, D		247.70		Soft brown to dark brown spongy amorphous PEAT		Dry		
	0.30	B, D		247.40	0.30	Light brown slightly gravelly slightly clayey fine to medium SAND with occasional roots and local black organic stains. Gravel is fine to coarse angular of sandstone				
	0.70	B, B, B, B, D		247.20	0.50	Reddish brown to brown very sandy very silty GRAVEL with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular up to 160mm of sandstone				
	1.50	B, D		246.10	1.60					
27/11	1.70	B, D		246.00	1.70	Medium strong brown SANDSTONE slightly to moderately weathered. Recovered as cobbles and some boulders with some finer material comprising slightly gravelly slightly silty fine to coarse sand. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 370mm of sandstone				
						END OF TRIAL PIT				
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 1.700m due to hard digging (possible bedrock).										
Driller	Originator AD	Ground-water						Fig No: B19 Sheet 1 of 1 Scale 1:50		
Chk & App	Status DRAFT	Struck	Rose To	Time(mins)	Cut Off					








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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555			
				Client: SHE Transmission plc				Trial Pit No. TP03			
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 1.50m			
Location: E 279042.2 N 708901.3				Orientation: Vertical				Equipment: 14T Tracked Excavator			
								Width - 1.30m Length - 3.70m			
Progress	Sample Depth	Samples and Tests		Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill		
		Type	Result						Symbol	Depth	
21/11 2023	0.30	B, D		236.85		Soft brown to dark brown spongy amorphous PEAT					
	0.50	ES		236.45	0.40	Brown to reddish brown very sandy silty GRAVEL with low cobble content. Gravel is fine to coarse sub-rounded to sub-angular of sandstone and psammite. Cobbles are sub-rounded to sub-angular up to 130mm of sandstone and psammite					
	0.60	B, B, B, D									
		1.00	B, D, ES		235.65	1.20					
21/11	1.30	B, B, B, D		235.35	1.50	Medium strong brown grey SANDSTONE. Rock is slightly to moderately weathered and recovered as: silty sand and gravel with low cobble content and low to medium boulder content. Sand is fine to medium. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular, up to 310mm of sandstone					
						----- END OF TRIAL PIT -----					
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 1.50m due to hard digging (possible bedrock).											
Driller	Originator AD	Ground-water									Fig No: B20 Sheet 1 of 1 Scale 1:50
		Struck	Rose To	Time(mins)	Cut Off						
Chk & App	Status DRAFT										


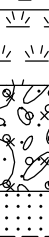


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<div><div>RAEBURN</div><div>DRILLING & GEOTECHNICAL LTD</div></div>				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555												
				Client: SHE Transmission plc Engineer: SSE Perth Inveralmond HSE				Trial Pit No. TP04												
								Trial Pit to 2.00m												
Location: E 279045.9 N 709078.8				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.70m								
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill										
		Type	Result							Symbol	Depth									
27/11/2023	0.20	B, D		250.56		Soft brown to dark brown spongy pseudo-fibrous PEAT with occasional pieces of wood		Dry												
	0.30	B, D		250.26	0.30	Light brown to light grey slightly gravelly very clayey fine to medium SAND. Gravel is fine to coarse angular and sub-angular of sandstone														
	0.60	B, B, B, B, D		250.16	0.40	Soft to firm reddish brown to brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular and subangular up to 140mm of sandstone														
	1.00	B																		
	1.60	B, B, D		249.16	1.40	Light brown very gravelly clayey fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular of sandstone. Cobbles are angular up to 150mm of sandstone														
27/11				248.56	2.00beneath 1.80m becoming low boulder content. Boulders are angular, up to 228mm and of brow sandstone														
							END OF TRIAL PIT													
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 2.00m due to hard digging (possible bedrock).																				
Driller	Originator AD	Ground-water								<div><div>RAEBURN</div></div>				Fig No: B21 Sheet 1 of 1 Scale 1:50						
Struck	Rose To	Time(mins)	Cut Off																	
Chk & App	Status DRAFT																			








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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP05							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 2.50m							
Location: E 279135.1 N 708794.4				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.40m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
27/11/2023	0.50	B, D, ES			223.47		Soft brown to dark brown spongy pseudo-fibrous PEAT with occasional pieces of wood								
	1.00	ES													
	1.50	B, D													
	2.00	B, B, B, B, D, ES			221.67	1.80	Brown silty SAND and GRAVEL with low to medium cobble content. Sand is fine to medium. Gravel is fine to coarse sub-rounded to subangular locally angular of sandstone and quartzite. Cobbles are subrounded to subangular up to 170mm and of sandstone								
27/11					220.97	2.50	END OF TRIAL PIT		Dry						
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit collapsed throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 2.50m due to hard digging (possible bedrock).															
Driller	Originator AD	Ground-water								 Fig No: B23 Sheet 1 of 1 Scale 1:50					
Chk & App	Status DRAFT	Struck	Rose To	Time(mins)	Cut Off										


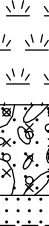


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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc Engineer: SSE Perth Inveralmond HSE				Trial Pit No. TP06							
								Trial Pit to 1.50m							
Location: E 279286.2 N 708910.8				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.80m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
21/11 2023	0.30	B, D, ES			229.63		Soft brown to dark brown spongy amorphous PEAT								
	0.60	ES			229.13	0.50	Brown to reddish brown very sandy silty GRAVEL with low cobble content and low boulder content. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 490mm of sandstone								
	0.80	B, B, B, B, D													
	1.00	B, D													
21/11	1.10	ES			228.43	1.20									
					228.13	1.50	Medium strong brown grey SANDSTONE. Rock is slightly to moderately weathered and recovered as: gravelly silty fine to medium sand with medium to high cobble content and medium boulder content. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 500mm of sandstone		Dry						
							----- END OF TRIAL PIT -----								
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 1.50m due to hard digging (possible bedrock).															
Driller		Originator AD		Ground-water										Fig No: B24 Sheet 1 of 1 Scale 1:50	
Struck		Rose To		Time(mins)		Cut Off									
Chk & App		Status DRAFT													


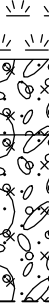


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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP07							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 1.20m							
Location: E 278976.9 N 708791.3				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.60m			
Progress 7/12 2023 7/12	Sample Depth	Samples and Tests			Level (m) 228.97	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
		0.30 B, D													
		0.70 B, B, B, B, B, D													
		1.00 B													
							228.57	0.40	Soft brown to dark brown spongy amorphous PEAT						
									Brown to reddish brown sandy clayey GRAVEL with medium to high cobble content and low boulder content. Sand is fine to coarse. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 240mm of sandstone						
							227.97	1.00	Medium strong brown SANDSTONE. Rock is slightly to moderately weathered and recovered as: boulders with some cobbles slightly gravelly slightly clayey fine to coarse sand. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 500mm of sandstone						
							227.77	1.20	END OF TRIAL PIT						
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was encountered at a depth of 1.20m. Trial pit was terminated at a depth of 1.20m due to hard digging (possible bedrock).															
Driller		Originator AD		Ground-water								Fig No: B25 Sheet 1 of 1 Scale 1:50			
				Struck 1.20	Rose To	Time(mins)	Cut Off								
Chk & App		Status DRAFT													















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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc Engineer: SSE Perth Inveralmond HSE				Trial Pit No. TP08							
								Trial Pit to 1.50m							
Location: E 279149.9 N 709062.8				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.50m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
21/11 2023	0.50 1.00	B, D, ES B, B, B, D, ES		247.01			Soft brown to dark brown spongy amorphous PEAT								
				246.31	0.70		Brown to reddish brown very gravelly silty fine to coarse SAND with low cobble content. Gravel is fine to coarse angular to subangular of sandstone and quartzite. Cobbles are angular and subangular up to 130mm of sandstone								
				245.71	1.30		Medium strong brown grey SANDSTONE. Rock is slightly to moderately weathered and recovered as: gravelly silty fine to medium sand with medium cobble content and low boulder content. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 320mm of sandstone								
				245.51	1.50		END OF TRIAL PIT								
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 1.50m due to hard digging (possible bedrock).															
Driller		Originator AD		Ground-water								Fig No: B26 Sheet 1 of 1 Scale 1:50			
Struck		Rose To		Time(mins)		Cut Off									
Chk & App		Status DRAFT													






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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555			
				Client: SHE Transmission plc				Trial Pit No. TP09			
				Engineer: SSE Perth Inveralmond HSE							
Location: E 278842.5 N 708873.5				Orientation: Vertical				Equipment:			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill	
		Type	Result							Symbol	Depth
27/11 2023	0.20	B, D			243.84		Soft brown to dark brown spongy amorphous PEAT with occasional pieces of wood				
	0.50	ES			243.44	0.40	Light brown to light grey very sandy slightly silty GRAVEL with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular locally sub-angular of sandstone. Cobbles are angular up to 130mm of sandstone				
	0.60	B, B, D									
	1.00	B, ES			242.94	0.90	Brown to reddish brown very sandy slightly silty GRAVEL with low cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse angular of sandstone. Cobbles are angular up to 150mm and of sandstone. Boulders are angular up to 250 mm of sandstone				
	1.50	B, B, B, B, B, D									
27/11	2.00	ES			241.84	2.00beneath 1.80m becoming low boulder content END OF TRIAL PIT				
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was encountered at a depth of 2.00m. Trial pit was terminated at a depth of 2.10m due to hard digging (possible bedrock).											
Driller	Originator AD	Ground-water									
		Struck 2.00	Rose To	Time(mins)	Cut Off						
Chk & App	Status DRAFT					Fig No: B27 Sheet 1 of 1 Scale 1:50					







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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP10							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 2.30m							
Location: E 278982.3 N 709176.9				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.60m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
28/11 2023	0.50	B, D, ES			255.65		Soft brown to dark brown spongy amorphous PEAT with occasional pieces of wood								
	1.00	ES													
	1.40	ES			254.35	1.30									
	1.50	B, B, B, B, D					Brown slightly gravelly silty fine to coarse SAND with low cobble content. Gravel is fine to coarse subangular to subrounded locally angular of sandstone and quartzite. Cobbles are subangular to subrounded up to 130mm of sandstone								
28/11	2.10	ES			253.45	2.20									
	2.20	B			253.35	2.30	Medium strong brown SANDSTONE slightly to moderately weathered. Recovered as silty SAND & GRAVEL with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 440mm of sandstone		Dry						
							END OF TRIAL PIT								
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 2.30m due to hard digging (possible bedrock).															
Driller	Originator AD	Ground-water													
		Struck	Rose To	Time(mins)	Cut Off										
Chk & App	Status DRAFT					Fig No: B28 Sheet 1 of 1 Scale 1:50									



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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP10 NEW							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 1.70m							
Location: E 279320.5 N 708826.9				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 4.10m			
Progress 30/11/2023	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
		B, D													
		B, B, B, D													
0.20			219.82	0.30	Topsoil: Dark brown slightly gravelly silty fine to medium SAND. Gravel is fine to coarse sub-rounded to sub-angular of sandstone and quartzite.										
0.50			219.52		Brown to reddish brown slightly gravelly slightly clayey to clayey fine to medium SAND with low cobble content. Gravel is fine to coarse sub-rounded to sub-angular of sandstone. Cobbles are sub-rounded to sub-angular up to 140mm of sandstone										
1.50	B, B, B, B, B, D		218.72	1.10	Brown to reddish brown gravelly slightly clayey to clayey fine to coarse SAND with medium cobble content and low to medium boulder content. Gravel is fine to coarse angular of sandstone. Boulders and cobbles are angular up to 390mm of sandstone										
				218.12	1.70	END OF TRIAL PIT									
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 1.70m due to hard digging (possible bedrock).															
Driller		Originator AD		Ground-water						Fig No: B29 Sheet 1 of 1 Scale 1:50					
				Struck	Rose To	Time(mins)	Cut Off								
Chk & App		Status DRAFT													



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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP11							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 2.50m							
Location: E 278832.8 N 709079.9				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.60m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
28/11/2023					257.73		Soft brown to dark brown spongy amorphous PEAT								
	0.50	B, D			257.13	0.60	Light brown to light grey very gravelly very silty SAND with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to sub-angular of sandstone. Cobbles are angular to sub-angular up to 80mm of sandstone Firm to stiff reddish brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to medium. Gravel is fine to coarse subangular locally sub-rounded of sandstone, granite and quartzite. Cobbles are subangular up to 140mm of sandstone and granite								
	0.70	B, D			256.83	0.90									
	1.00 1.10	B B, B, B, D													
	2.10	B, B, D			255.43	2.30	Brown very clayey SAND & GRAVEL with medium cobble content and occasional lenses of soft brown clay. Sand is fine to coarse. Gravel is fine to coarse angular of sandstone. Cobbles are angular up to 150mm of sandstone								
	2.50	B, B, B, D													
28/11					254.93	2.80	END OF TRIAL PIT								
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 2.80m due to hard digging (possible bedrock).															
Driller		Originator AD		Ground-water								Fig No: B30 Sheet 1 of 1 Scale 1:50			
Struck		Rose To		Time(mins)		Cut Off									
Chk & App		Status DRAFT													













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				Site: LT520 BRACO WEST SUBSTATION						Contract No: 26555	
				Client: SHE Transmission plc Engineer: SSE Perth Inveralmond HSE						Trial Pit No. TP11 NEW	
										Trial Pit to 2.20m	
Location: E 279319.6 N 709178.6			Orientation: Vertical			Equipment: 14T Tracked Excavator			Width - 1.30m Length - 3.80m		
Progress 30/11/2023	Sample Depth	Samples and Tests		Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill		
		Type	Result						Symbol	Depth	
	0.50	D		250.74		Soft brown to dark brown spongy pseudo-fibrous PEAT					
1.00	B, B, B, B, D		250.14	0.60	Reddish brown to brown slightly gravelly silty to very silty fine to medium SAND with low cobble content and low boulder content. Gravel is fine to coarse angular and subangular of sandstone. Cobbles and boulders are angular and subangular up to 250mm of sandstone						
1.90	B, B, B, D		249.24	1.50	Reddish brown slightly gravelly to gravelly slightly clayey to clayey fine to medium SAND with low to medium cobble content. Gravel is fine to coarse angular of sandstone. Cobbles are angular up to 160mm of sandstone						
2.00	B		248.74	2.00	Medium strong brown SANDSTONEslightly to moderately weathered. Recovered as boulders with some cobbles and much finer material comprising of slightly gravelly slightly clayey fine to coarse sand. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 430mm of sandstone						
			248.54	2.20	END OF TRIAL PIT						
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 2.20m due to hard digging (possible bedrock).											
Driller AD		Originator AD		Ground-water						Fig No: B31 Sheet 1 of 1 Scale 1:50	
Struck		Rose To		Time(mins)		Cut Off					
Chk & App		Status DRAFT									








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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP12 NEW							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 2.00m							
Location: E 279448.5 N 709253.8				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 4.30m			
Progress 30/11/2023	Sample Depth	Samples and Tests Type Result		Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill						
				251.72					Symbol	Depth					
	0.20	B, D		251.37	0.35	Soft brown to dark brown spongy amorphous PEAT									
	0.60	B, B, B, B, D				Reddish brown slightly gravelly clayey fine to medium SAND with low cobble content. Gravel is fine to coarse subrounded to subangular of sandstone. Cobbles subangular to subrounded up to 120mm of sandstone									
	1.00	B													
	1.20	D													
	1.60	B, B, B, B		250.32	1.40	Brown to reddish brown gravelly slightly clayey to clayey fine to medium SAND with low to medium cobble content and low boulder content. Gravel is fine to coarse angular of sandstone. Boulders and cobbles are angular up to 335mm of sandstone									
				249.72	2.00	END OF TRIAL PIT									
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 2.00m due to hard digging (possible bedrock).															
Driller AD		Originator AD		Ground-water								Fig No: B32 Sheet 1 of 1 Scale 1:50			
Struck		Rose To		Time(mins)		Cut Off									
Chk & App		Status DRAFT													








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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP13 NEW							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 2.40m							
Location: E 279072.2 N 708706.9				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.80m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
1/12 2023	0.00	B, D			221.41	0.20	Soft brown to dark brown spongy amorphous PEAT								
	0.50	B, B, B, B, B, D			221.21	0.70	Brown silty SAND and GRAVEL with medium cobble content and low boulder content. Sand is fine to coarse. Gravel is fine to coarse rounded to subangular of sandstone and quartzite. Cobbles and boulders are rounded to subangular up to 225mm of sandstone								
	1.00	B, B, B, B, B, D			220.71		Brown to reddish brown very gravelly slightly clayey to clayey fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular and subangular of sandstone. Cobbles are angular and subangular up to 160mm of sandstone								
	2.00	B, B, B, B, D					...beneath 1.80m becoming low boulder content. Boulders are angular, up to 570mm and includes sandstone								
1/12					219.01	2.40	END OF TRIAL PIT								
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was encountered at a depth of 1.50m. Trial pit was terminated at a depth of 2.40m due to hard digging (possible bedrock).															
Driller		Originator AD		Ground-water								Fig No: B33 Sheet 1 of 1 Scale 1:50			
Struck		Rose To		Time(mins)		Cut Off									
Chk & App		Status DRAFT													




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				Site: LT520 BRACO WEST SUBSTATION					Contract No: 26555		
				Client: SHE Transmission plc					Trial Pit No. TP19		
				Engineer: SSE Perth Inveralmond HSE					Trial Pit to 2.50m		
Location: E 278933.5 N 709111.8			Orientation: Vertical		Equipment: 14T Tracked Excavator			Width - 1.30m Length - 3.10m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill	
		Type	Result							Symbol	Depth
28/11/2023	0.50	B, D			255.47		Soft brown to dark brown spongy pseudo-fibrous PEAT with occasional pieces of wood				
	0.80	B, D			254.77	0.70					
	1.00	B			254.57	0.90	Light brown to light grey slightly gravelly slightly clayey fine to medium SAND. Gravel is fine to medium subangular of sandstone				
	1.10	B, B, B, D					Firm reddish brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to medium. Gravel is fine to coarse subangular, locally subrounded of sandstone, granite and quartzite. Cobbles are subangular up to 140mm of sandstone and granite				
	1.20	B									
	2.10	B, B, D									
28/11	2.40	B			253.07	2.40					
					252.97	2.50	Medium strong brown SANDSTONE, slightly to moderately weathered. Recovered as boulders with some cobbles and much finer material comprising of slightly gravelly slightly clayey fine to coarse sand. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 550mm of sandstone.		Dry		
							END OF TRIAL PIT				
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 2.50m due to hard digging (possible bedrock).											
Driller	Originator AD	Ground-water									
		Struck	Rose To	Time(mins)	Cut Off						
Chk & App	Status DRAFT					Fig No: B34 Sheet 1 of 1 Scale 1:50					


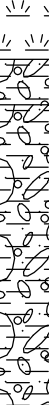



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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP20							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 1.70m							
Location: E 278760.5 N 708969.6				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.30m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
28/11/2023	0.50	B, D, ES					Soft brown to dark brown spongy pseudo-fibrous PEAT with occasional pieces of wood								
	1.00	ES													
	1.40	B, B, B, B, D, ES			252.11	1.30	Grey to reddish brown very gravelly silty fine to coarse SAND with high cobble content. Gravel is fine to coarse angular locally sub-angular of sandstone. Cobbles are angular to subangular of sandstone.								
	1.60	B			251.81 251.71	1.60 1.70									
28/11							Medium strong brown SANDSTONE. Slightly to moderately weathered. Recovered as cobbles with some boulders and much finer material comprising of slightly gravelly slightly clayey fine to coarse sand. Gravel is fine to coarse angular of sandstone. Cobbles and boulder are angular up to 500mm of sandstone		Dry						
							END OF TRIAL PIT								
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 1.70m due to hard digging (possible bedrock).															
Driller	Originator AD	Ground-water													
		Struck	Rose To	Time(mins)	Cut Off										
Chk & App	Status DRAFT														
								Fig No: B35 Sheet 1 of 1 Scale 1:50							




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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP21							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 3.00m							
Location: E 279425.0 N 709522.9				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.80m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
20/11/2023	0.50	B, B, B, D, ES		242.53	0.10	MADE GROUND: Dark brown slightly gravelly silty fine to coarse SAND with occasional roots. Gravel is fine to coarse subangular to subrounded of granite and psammite									
0.70	D		241.83	0.70	MADE GROUND: Reddish brown gravelly clayey fine to coarse sand with medium to high cobble content and occasional pieces of wood. Gravel is fine to coarse angular locally subangular of granite. Cobbles are angular up to 150mm of granite										
1.00	B, D, ES		241.78	0.75	Dark brown slightly gravelly silty fine to coarse SAND with occasional roots. Gravel is fine to medium subrounded of granite psammite and quartzite. Relict/buried Topsoil										
1.50	B, B, B, D, ES		241.33	1.20	Soft brown to light brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded of granite, psammite and sandstone										
2.50	B, B, D, ES				Soft reddish brown slightly sandy slightly gravelly CLAY with low cobble content and low boulder content. Sand is fine to medium. Gravel is fine to coarse subrounded locally subangular and includes granite psammite sandstone and quartzite. Cobbles and boulders are sub-rounded up to 125mm of granite and psammite										
				beneath 2.50m becoming very sandy										
20/11				239.53	3.00	END OF TRIAL PIT			Dry						
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 3.00m due to reaching scheduled depth.															
Driller	Originator AD	Ground-water						Fig No: B36 Sheet 1 of 1 Scale 1:50							
Chk & App	Status DRAFT	Struck	Rose To	Time(mins)	Cut Off										

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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555		
				Client: SHE Transmission plc				Trial Pit No. TP22		
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 2.80m		
Location: E 279338.8 N 709439.4			Orientation: Vertical		Equipment: 14T Tracked Excavator			Width - 1.30m Length - 2.60m		
Progress	Sample Depth	Samples and Tests		Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill	
		Type	Result						Symbol	Depth
20/11/2023	0.30	B, D		249.20		Soft brown to dark brown spongy pseudo-fibrous PEAT				
	0.50	B, D, ES		248.80	0.40	Firm grey slightly sandy slightly gravelly CLAY with low cobble content and occasional roots. Sand is fine to coarse. Gravel is fine to coarse rounded to subrounded of granite, psammite and quartzite				
	1.00	B, B, B, D, ES		248.50	0.70	Soft to firm reddish brown slightly sandy gravelly CLAY with medium cobble content and low boulder content. Sand is fine to medium. Gravel is fine to coarse subrounded, locally subangular of granite, psammite, sandstone and quartzite. Cobbles and boulders are sub-rounded up to 128mm of granite and psammite				
	2.00	B, B, D, ES								
20/11				246.50	2.70	Medium strong brown grey SANDSTONE slightly weathered. Recovered as slightly silty sandy gravel with medium cobble content and low boulder content. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 240mm of sandstone END OF TRIAL PIT		Dry		
				246.40	2.80					
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 2.80m due to hard digging (possible bedrock).										
Driller	Originator AD	Ground-water					Fig No: B37 Sheet 1 of 1 Scale 1:50			
Chk & App	Status DRAFT	Struck	Rose To	Time(mins)	Cut Off					

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				Site: LT520 BRACO WEST SUBSTATION				Contract No: 26555							
				Client: SHE Transmission plc				Trial Pit No. TP23							
				Engineer: SSE Perth Inveralmond HSE				Trial Pit to 2.10m							
Location: E 279253.9 N 709333.8				Orientation: Vertical				Equipment: 14T Tracked Excavator				Width - 1.30m Length - 3.70m			
Progress	Sample Depth	Samples and Tests			Level (m)	Depth	Description of Strata	Legend	Water Depth	Backfill					
		Type	Result							Symbol	Depth				
21/11 2023	0.30	B, D, ES			251.53		MADE GROUND: Grey to brown gravelly silty fine to coarse sand with medium cobble content and occasional roots, pieces of wood and a plastic net. Gravel is fine to coarse angular of granite. Cobbles are angular up to 150mm of granite								
	0.60	B, D, ES			251.03	0.50	Soft brown to dark brown spongy pseudo-fibrous PEAT								
	0.90	B, D, ES			250.73	0.80	Brown to orange brown gravelly slightly silty fine to coarse SAND. Gravel is fine to coarse subangular of granite, psammite and quartzite								
	1.25	B, B, B, B, D, ES			250.38	1.15	Reddish brown very gravelly very silty fine to coarse SAND with low cobble content. Gravel is fine to coarse angular of sandstone. Cobbles are angular up to 160mm of sandstone								
						beneath 1.60m becoming medium cobble content.								
	2.00	B, B, D, ES			249.53 249.43	2.00 2.10	Medium strong reddish brown SANDSTONE slightly to moderately weathered. Recovered as gravelly silty fine to coarse sand with medium to high cobble content and low boulder content. Gravel is fine to coarse angular of sandstone. Cobbles and boulders are angular up to 280mm of sandstone								
							END OF TRIAL PIT								
Remarks: Trial pit CAT scanned prior to excavation to check for services. The walls of the pit stood vertical throughout excavation. Ground-water was not encountered. Trial pit was terminated at a depth of 2.10m due to hard digging (possible bedrock).															
Driller		Originator AD		Ground-water						Fig No: B38 Sheet 1 of 1 Scale 1:50					
Struck		Rose To		Time(mins)		Cut Off									
Chk & App		Status DRAFT													



Site: LT520 BRACO WEST SUBSTATION

Contract No: 26555

Client: SHE Transmission plc

Engineer: SSE Perth Inveralmond HSE

APPENDIX C
PHOTOGRAPHS





	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	

RAEBURN	Fig No:
	C1





Originator	RB
Chk & App	Status
FMR	FINAL

Title:

SONIC & ROCK CORE PHOTOGRAPHS

Fig No:

C2



Originator	RB
Chk & App	Status
FMR	FINAL

Title:	SONIC & ROCK CORE PHOTOGRAPHS
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Fig No:	C2
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	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	

Fig No:
C3



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	



Originator	RB
Chk & App	Status
FMR	FINAL

Title:	SONIC & ROCK CORE PHOTOGRAPHS
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Fig No:	C4
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Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS		Fig No: C4
RB			
Status			
FINAL			



Originator	RB
Chk & App	Status
FMR	FINAL

Title:	SONIC & ROCK CORE PHOTOGRAPHS
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Fig No:	C4
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	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	





Originator	RB
Chk & App	Status
FMR	FINAL

Title:	SONIC & ROCK CORE PHOTOGRAPHS
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Fig No:	C6
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Originator
RB

Chk & App
FMR

Status
FINAL

Title:

SONIC & ROCK CORE PHOTOGRAPHS

RAEBURN

Fig No:

C6



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	

RAEBURN	Fig No:
	C7



Originator	RB
Chk & App	Status
FMR	FINAL

Title: SONIC & ROCK CORE PHOTOGRAPHS



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	



Originator	RB
Chk & App	Status
FMR	FINAL

Title:	SONIC & ROCK CORE PHOTOGRAPHS
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Fig No:	C8
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Originator	RB
Chk & App	Status
FMR	FINAL

Title:	SONIC & ROCK CORE PHOTOGRAPHS
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Fig No:	C8
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Originator	RB
Chk & App	Status
FMR	FINAL

Title: SONIC & ROCK CORE PHOTOGRAPHS





	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	

RAEBURN	Fig No:
	C11



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	

RAEBURN	Fig No:
	C11



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	



Originator
RB

Title:

SONIC & ROCK CORE PHOTOGRAPHS

RAEBURN

Fig No:

C12

Chk & App
FMR

Status
FINAL



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	



	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	

RAEBURN	Fig No:
	C13





	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	





	Originator	Title: SONIC & ROCK CORE PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	

RAEBURN	Fig No:
	C15



Originator	RB
Chk & App	Status
FMR	FINAL

Title:	SONIC & ROCK CORE PHOTOGRAPHS
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Fig No:	C16
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Originator	RB
Chk & App	Status
FMR	FINAL

Title:	SONIC & ROCK CORE PHOTOGRAPHS
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Fig No:	C17
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Originator	RB
Chk & App	Status
FMR	FINAL

Title: SONIC & ROCK CORE PHOTOGRAPHS











	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	

RAEBURN	Fig No: C20
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	Originator
	RB
Chk & App	Status
FMR	FINAL

Title:


TRIAL PIT PHOTOGRAPHS

Fig No:

C21



Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 17:56:38 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator RB	Title: TRIAL PIT PHOTOGRAPHS		Fig No: C21
Chk & App FMR	Status FINAL			







Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 17:57:04 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	





Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 17:57:04 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	







Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 17:57:16 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	







Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 17:57:29 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	





	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	



Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 17:57:53 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	

RAEBURN	Fig No:
	C27



	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	





Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 17:58:07 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	







Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:04:45 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	





Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:04:56 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	







Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:05:08 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	





Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:05:21 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	









Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:05:43 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator	Title: TRIAL PIT PHOTOGRAPHS
	RB	
Chk & App	Status	
FMR	FINAL	







Style: TP PHOTOS File: P:\GINTWP\PROJECTS\26555.GPJ Printed: 25/01/2024 18:05:55 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com





Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:06:07 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com



Style: TP PHOTOS File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 17:58:19 Raeburn Drilling and Geotechnical, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

	Originator
	RB
Chk & App	Status
FMR	FINAL

Title:
TRIAL PIT PHOTOGRAPHS

Fig No:
C29



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Test Pit No TP03

Test Run No 1

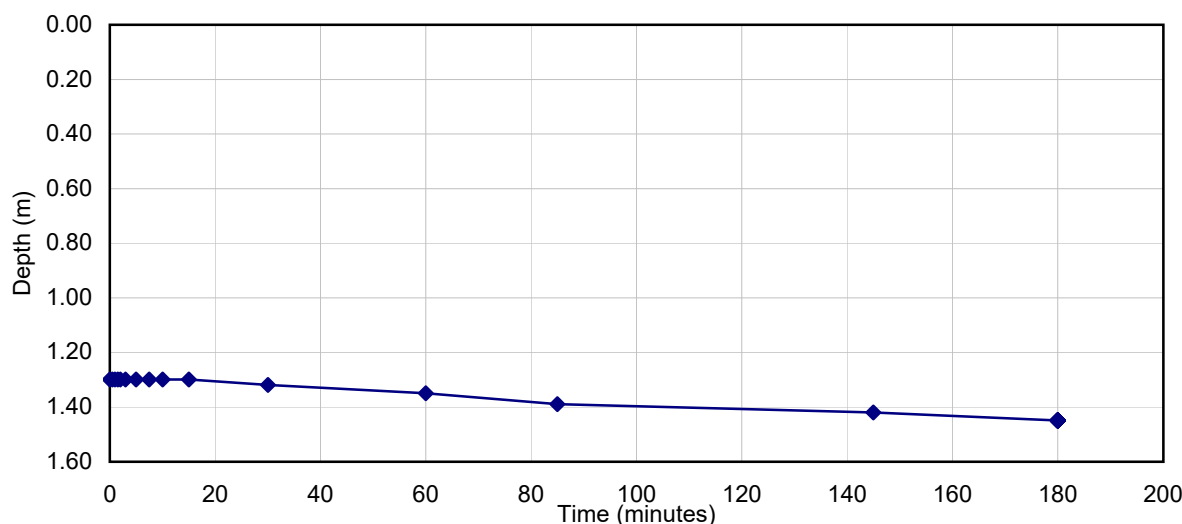
Date of Test 06.12.23

Time (minute)	Depth to Water (m)
0	1.30
0.5	1.30
1	1.30
1.5	1.30
2	1.30
3	1.30
5	1.30
7.5	1.30
10	1.30
15	1.30
30	1.32
60	1.35
85	1.39
145	1.42
180	1.45

Weather Conditions		
Dry, cold		
Non Engineering Strata Description		
0.00-0.40: PEAT		
0.40-0.90: Light greyish brown SAND and GRAVEL with cobbles.		
0.90-2.00: Reddish brown silty SAND and GRAVEL with cobbles.		
Test Pit Dimensions		
Length	m	2.90
Width	m	0.80
Depth	m	2.00
Test Parameters		
Maximum Effective Depth	m	1.30
75% Effective Depth	m	1.48
25 % Effective Depth	m	1.83
Effective Storage Volume	m ³	0.81
Surface Area a _{p50}	m ²	4.91
Time for 75%	min	~
Time for 25%	min	~
t _{p75-25}	min	~

Soil Infiltration Rate
INDETERMINATE

Comments
Bedrock at 2.00m. Test terminated due to slow water outflow.



Originator	Checked & Approved	SOAKAWAY BRE 365	
RB	 14/12/2023		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Test Pit No TP06

Test Run No 1

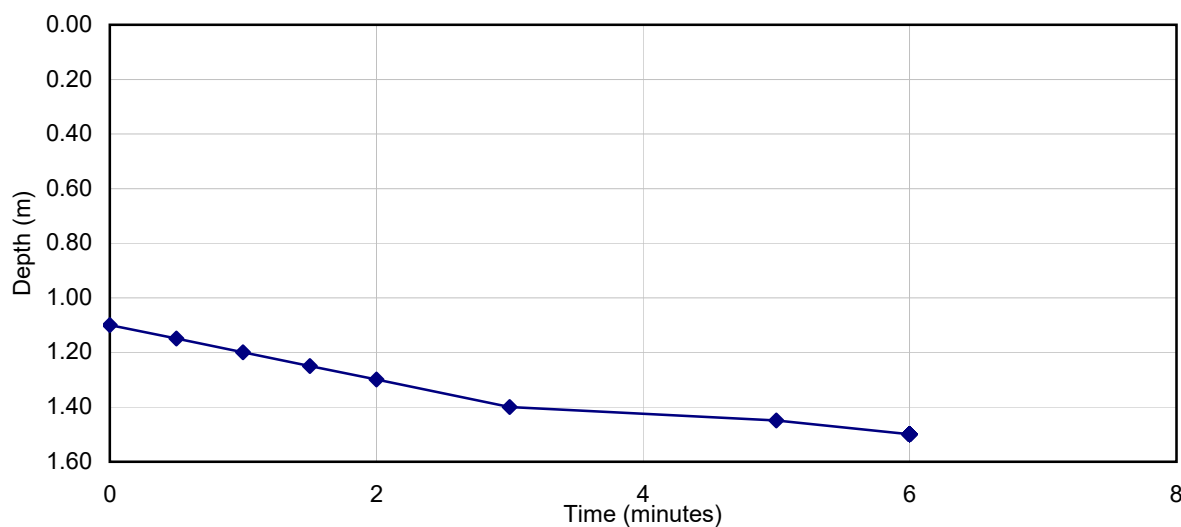
Date of Test 06.12.23

Time (minute)	Depth to Water (m)
0	1.10
0.5	1.15
1	1.20
1.5	1.25
2	1.30
3	1.40
5	1.45
6	1.50

Weather Conditions	
Dry, cold	
Non Engineering Strata Description	
0.00-0.40: PEAT 0.40-1.20: Reddish brown gravelly silty SAND with cobbles and boulders. 1.20-1.50: Greyish brown SANDSTONE.	
Test Pit Dimensions	
Length	m 3.20
Width	m 1.10
Depth	m 1.50
Test Parameters	
Maximum Effective Depth	m 1.10
75% Effective Depth	m 1.20
25 % Effective Depth	m 1.40
Effective Storage Volume	m ³ 0.70
Surface Area a _{p50}	m ² 5.24
Time for 75%	min 1
Time for 25%	min 3
t _{p75-25}	min 2

Soil Infiltration Rate
1.1E-03 m/s

Comments
Bedrock at 1.50m. Unable to fill pit above 1.10m due to filtration rate.



Originator	Checked & Approved	SOAKAWAY BRE 365	
RB	 14/12/2023		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Test Pit No TP06

Test Run No 2

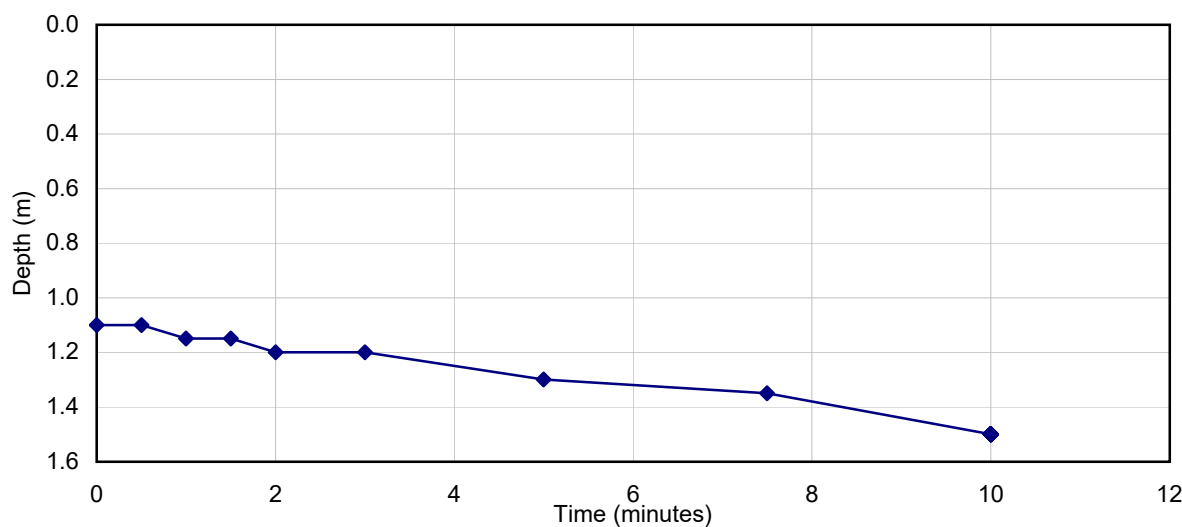
Date of Test 06.12.23

Time (minute)	Depth to Water (m)
0	1.10
0.5	1.10
1	1.15
1.5	1.15
2	1.20
3	1.20
5	1.30
7.5	1.35
10	1.50

Weather Conditions	
Dry, cold	
Non Engineering Strata Description	
0.00-0.40: PEAT 0.40-1.20: Reddish brown gravelly silty SAND with cobbles and boulders. 1.20-1.50: Greyish brown SANDSTONE.	
Test Pit Dimensions	
Length	m 3.20
Width	m 1.10
Depth	m 1.50
Test Parameters	
Maximum Effective Depth	m 1.10
75% Effective Depth	m 1.20
25 % Effective Depth	m 1.40
Effective Storage Volume	m ³ 0.70
Surface Area a _{p50}	m ² 5.24
Time for 75%	min 2
Time for 25%	min 8.3
t _{p75-25}	min 6

Soil Infiltration Rate
3.6E-04 m/s

Comments
Bedrock at 1.50m. Unable to fill pit above 1.10m due to filtration rate.



Originator	Checked & Approved	SOAKAWAY BRE 365	
RB	 14/12/2023		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Test Pit No TP06

Test Run No 3

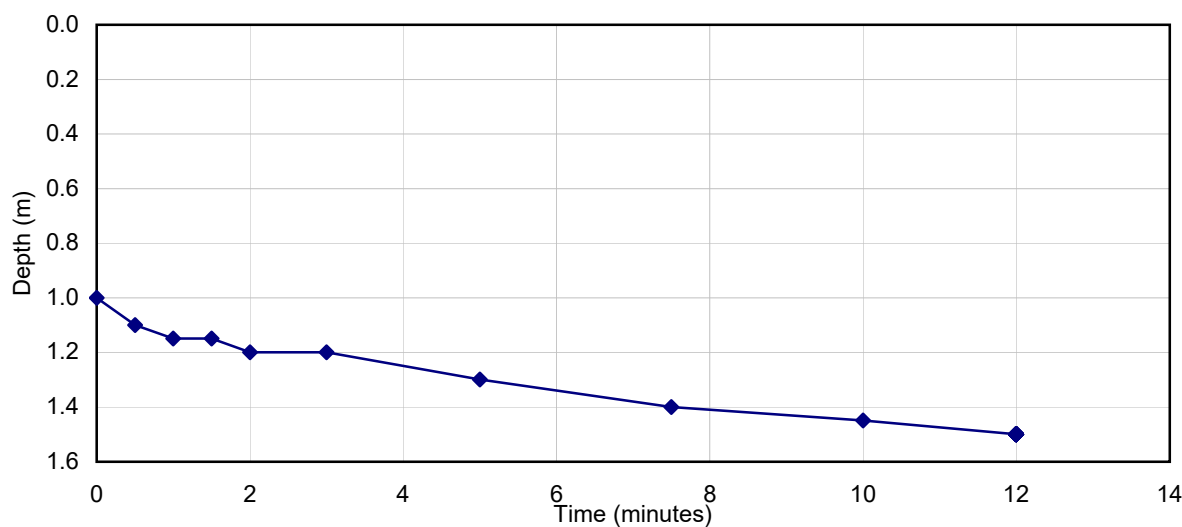
Date of Test 06.12.23

Time (minute)	Depth to Water (m)
0	1.00
0.5	1.10
1	1.15
1.5	1.15
2	1.20
3	1.20
5	1.30
7.5	1.40
10	1.45
12	1.50

Weather Conditions	
Dry, cold	
Non Engineering Strata Description	
0.00-0.40: PEAT 0.40-1.20: Reddish brown gravelly silty SAND with cobbles and boulders. 1.20-1.50: Greyish brown SANDSTONE.	
Test Pit Dimensions	
Length	m 3.20
Width	m 1.10
Depth	m 1.50
Test Parameters	
Maximum Effective Depth	m 1.00
75% Effective Depth	m 1.13
25 % Effective Depth	m 1.38
Effective Storage Volume	m ³ 0.88
Surface Area a _{p50}	m ² 5.67
Time for 75%	min 0.78
Time for 25%	min 7
t _{p75-25}	min 6

Soil Infiltration Rate
4.2E-04 m/s

Comments
Bedrock at 1.50m.



Originator	Checked & Approved	SOAKAWAY BRE 365	
RB	 14/12/2023		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Test Pit No TP07

Test Run No 1

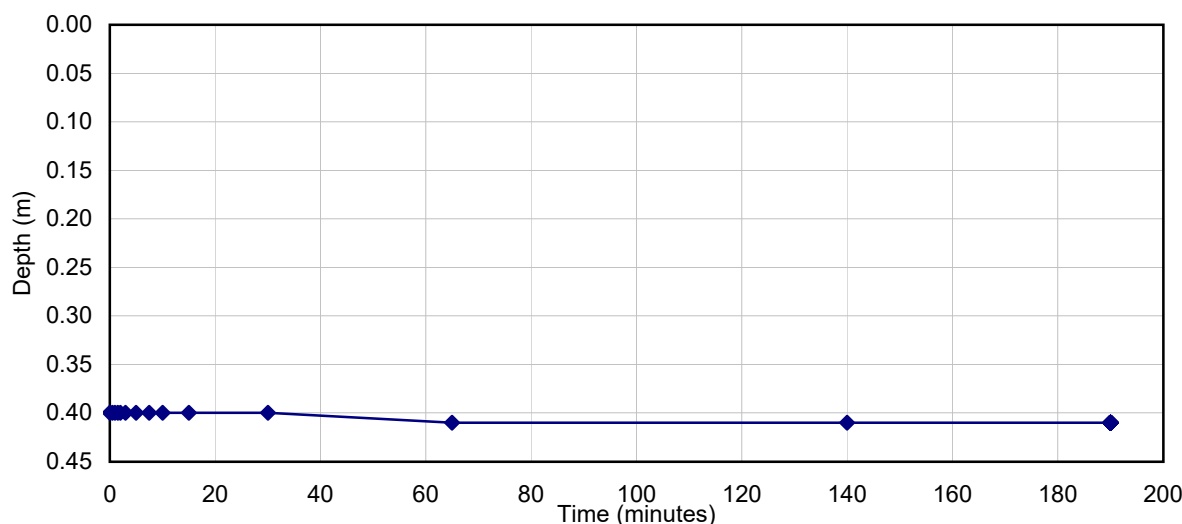
Date of Test 05.12.23

Time (minute)	Depth to Water (m)
0	0.40
0.5	0.40
1	0.40
1.5	0.40
2	0.40
3	0.40
5	0.40
7.5	0.40
10	0.40
15	0.40
30	0.40
65	0.41
140	0.41
190	0.41

Weather Conditions	
Dry, cold	
Non Engineering Strata Description	
0.00-0.40: PEAT 0.40-1.00: Reddish brown sandy clayey GRAVEL with cobbles and boulders. 1.00-1.20: Greyish brown slightly clayey slightly gravelly SANDSTONE with cobbles and boulders.	
Test Pit Dimensions	
Length	m 2.00
Width	m 1.10
Depth	m 1.20
Test Parameters	
Maximum Effective Depth	m 0.40
75% Effective Depth	m 0.60
25 % Effective Depth	m 1.00
Effective Storage Volume	m ³ 0.88
Surface Area a _{p50}	m ² 4.68
Time for 75%	min ~
Time for 25%	min ~
t _{p75-25}	min ~

Soil Infiltration Rate
INDETERMINATE

Comments
Bedrock at 1.20m. Test terminated due to slow water outflow.



Originator	Checked & Approved	SOAKAWAY BRE 365	
RB	 14/12/2023		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Test Pit No TP13

Test Run No 1

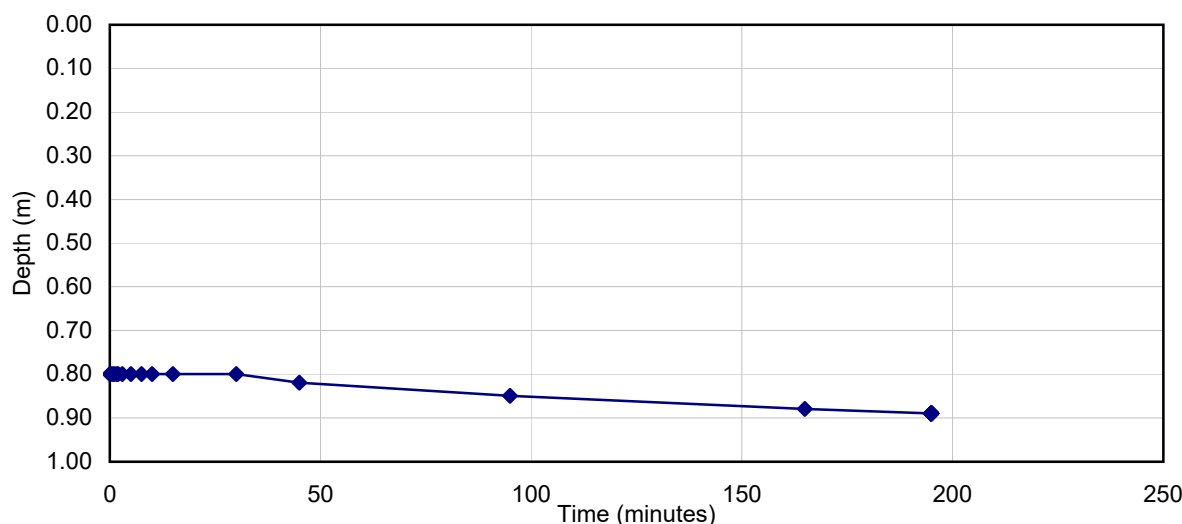
Date of Test 05.12.23

Time (minute)	Depth to Water (m)
0	0.80
0.5	0.80
1	0.80
1.5	0.80
2	0.80
3	0.80
5	0.80
7.5	0.80
10	0.80
15	0.80
30	0.80
45	0.82
95	0.85
165	0.88
195	0.89

Weather Conditions		
Dry, cold		
Non Engineering Strata Description		
0.00-0.40: PEAT		
0.40-0.90: Brown SAND and GRAVEL with cobbles and boulders.		
0.90-2.00: Reddish brown very gravelly clayey SAND with cobbles.		
Test Pit Dimensions		
Length	m	2.10
Width	m	0.90
Depth	m	1.80
Test Parameters		
Maximum Effective Depth	m	0.80
75% Effective Depth	m	1.05
25 % Effective Depth	m	1.55
Effective Storage Volume	m ³	0.95
Surface Area a _{p50}	m ²	4.89
Time for 75%	min	~
Time for 25%	min	~
t _{p75-25}	min	~

Soil Infiltration Rate
INDETERMINATE

Comments
Bedrock at 2.00m. Test terminated due to slow water outflow.



Originator	Checked & Approved	SOAKAWAY BRE 365	
RB	 14/12/2023		



Site

LT520 BRACO WEST SUBSTATION

Contract No 26555

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Date tested 28.11.23

Test Location TP02

Tested by RF

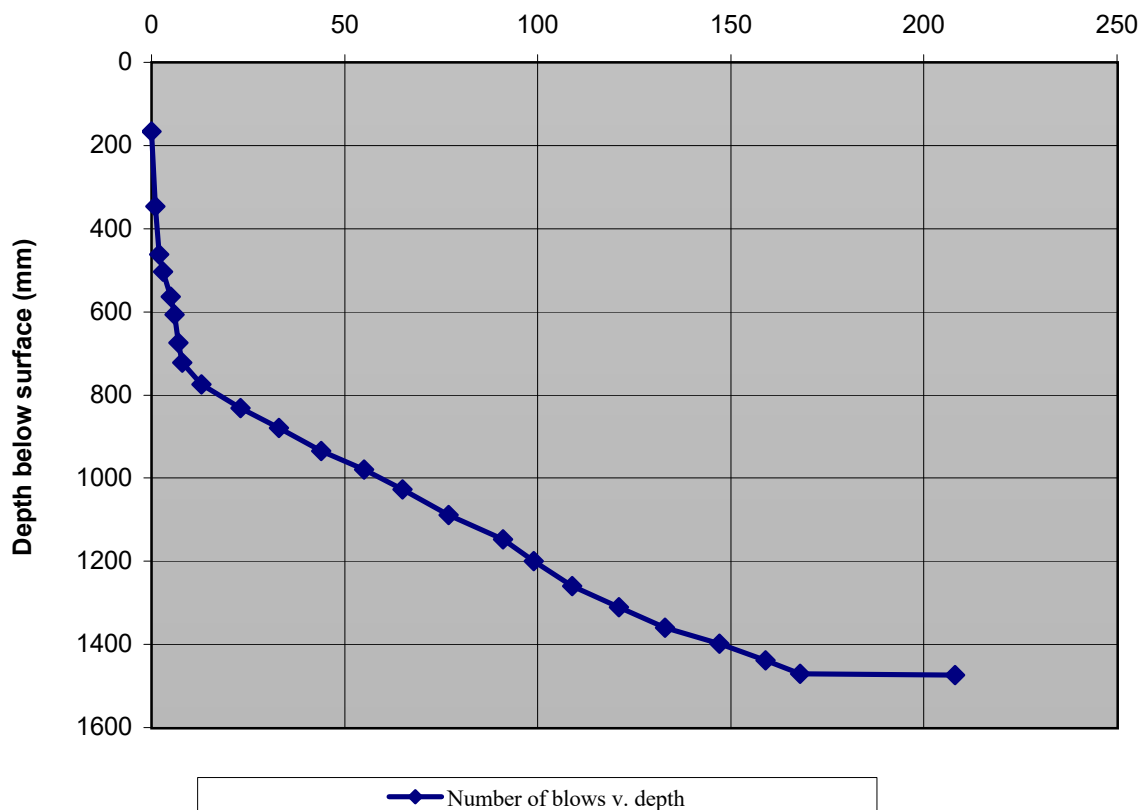
DCP No. 1

Weather Sunny, clear, cold

Zero Error (mm) 167

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
167	722	8	8	Topsoil	69.38	3
722	1259	109	101	Unknown	5.32	52
1259	1471	168	59	Unknown	3.59	78
1471	1474	208	40	Unknown	0.08	4667

Remarks:

Cone Angle 60°

UKAS accredited test - No

Test stopped to add extension rods at a depth of 892mm

Test stopped at 1474mm due to refusal of equipment to further penetration

Originator

Checked & Approved

Dynamic Cone Penetrometer

IM

06/12/2023

In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB

Sheet 1 of 1



Site

LT520 BRACO WEST SUBSTATION

Contract No 26555

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Date tested 28.11.23

Test Location TP03

Tested by RF

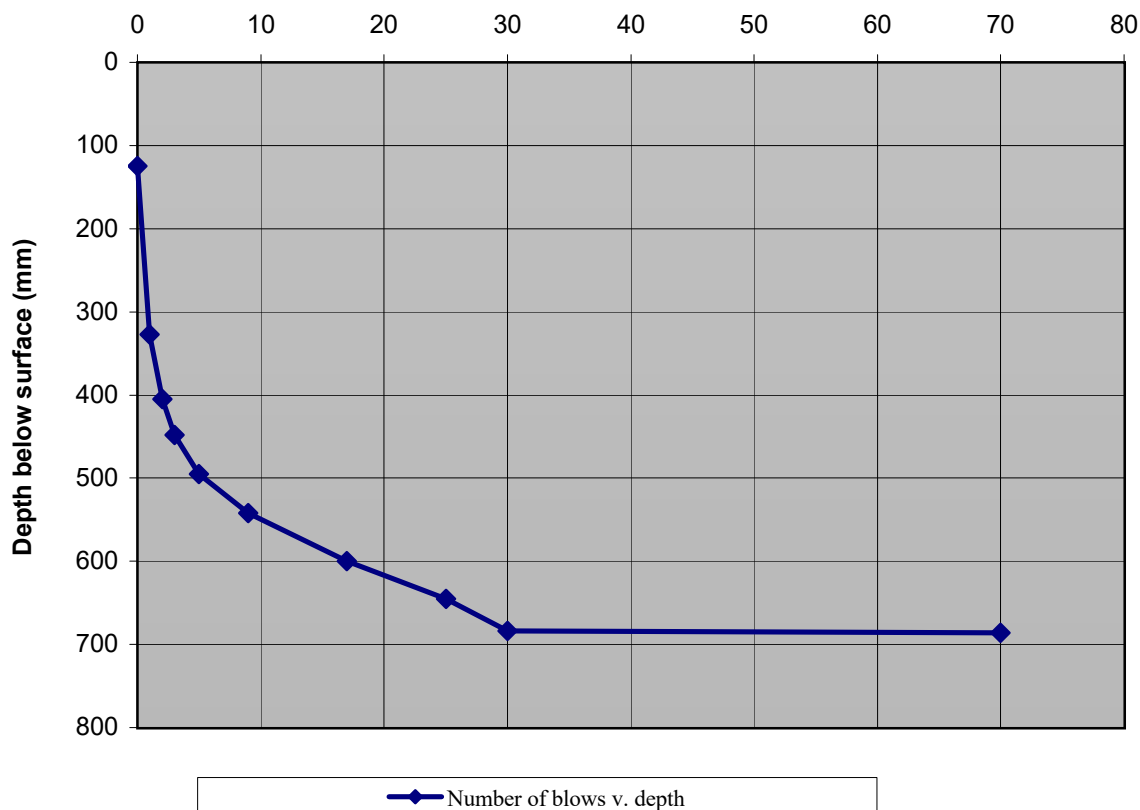
DCP No. 2

Weather Sunny, clear, cold

Zero Error (mm) 125

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
125	405	2	2	Topsoil	140.00	2
405	495	5	3	Unknown	30.00	8
495	645	25	20	Unknown	7.50	36
645	684	30	5	Unknown	7.80	34
684	686	70	40	Unknown	0.05	7165

Remarks:

Cone Angle 60°

UKAS accredited test - No

Test stopped to add extension rods at a depth of 892mm

Test stopped at 684mm due to refusal of equipment to further penetration

Originator

Checked & Approved

Dynamic Cone Penetrometer

IM

06/12/2023

In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB

Sheet 1 of 1



Site

LT520 BRACO WEST SUBSTATION

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Contract No 26555

Date tested 28.11.23

Test Location TP04

Tested by RF

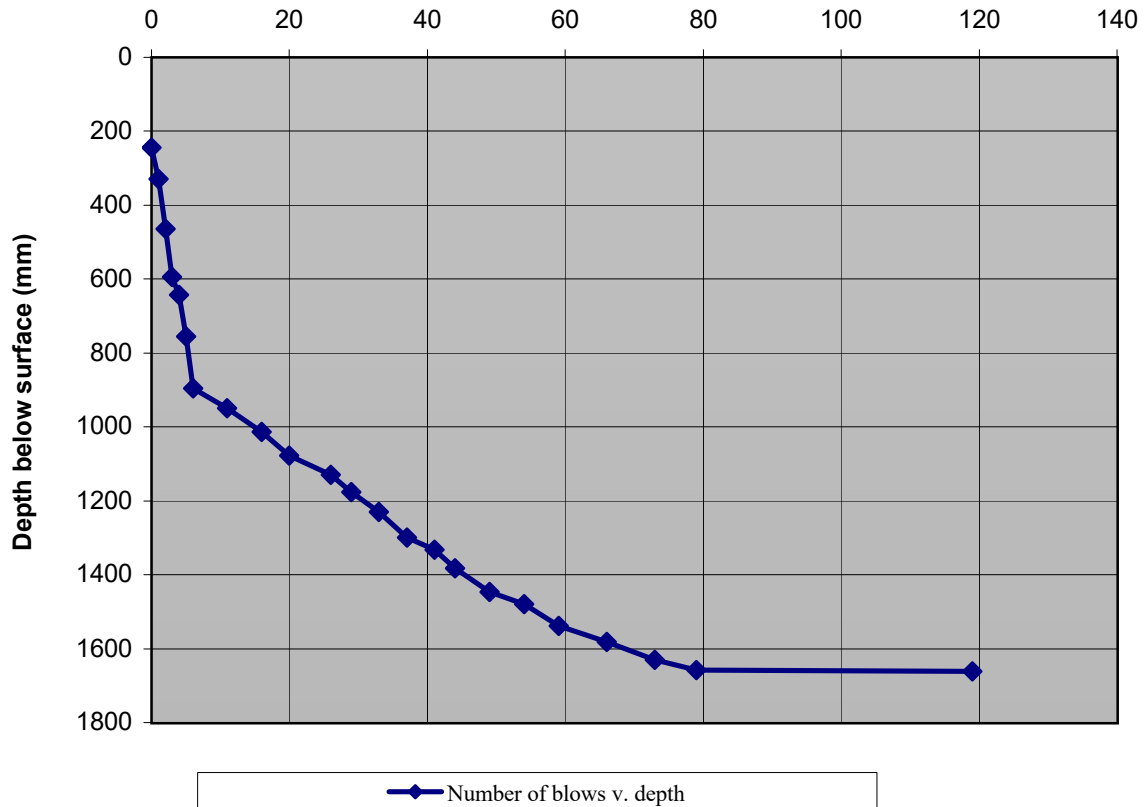
DCP No. 3

Weather Sunny, clear, cold

Zero Error (mm) 245

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
245	895	6	6	Topsoil	108.33	2
895	1129	26	20	Unknown	11.70	22
1129	1333	41	15	Unknown	13.60	19
1333	1658	79	38	Unknown	8.55	31
1658	1661	119	40	Unknown	0.08	4667

Remarks:

Cone Angle 60°

UKAS accredited test - No

Test stopped to add extension rods at a depth of 895mm

Test stopped at 1661mm due to refusal of equipment to further penetration

Originator

Checked & Approved

Dynamic Cone Penetrometer

IM

06/12/2023

In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB

Sheet 1 of 1



Site

LT520 BRACO WEST SUBSTATION

Contract No 26555

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Date tested 28.11.23

Test Location TP07

Tested by RF

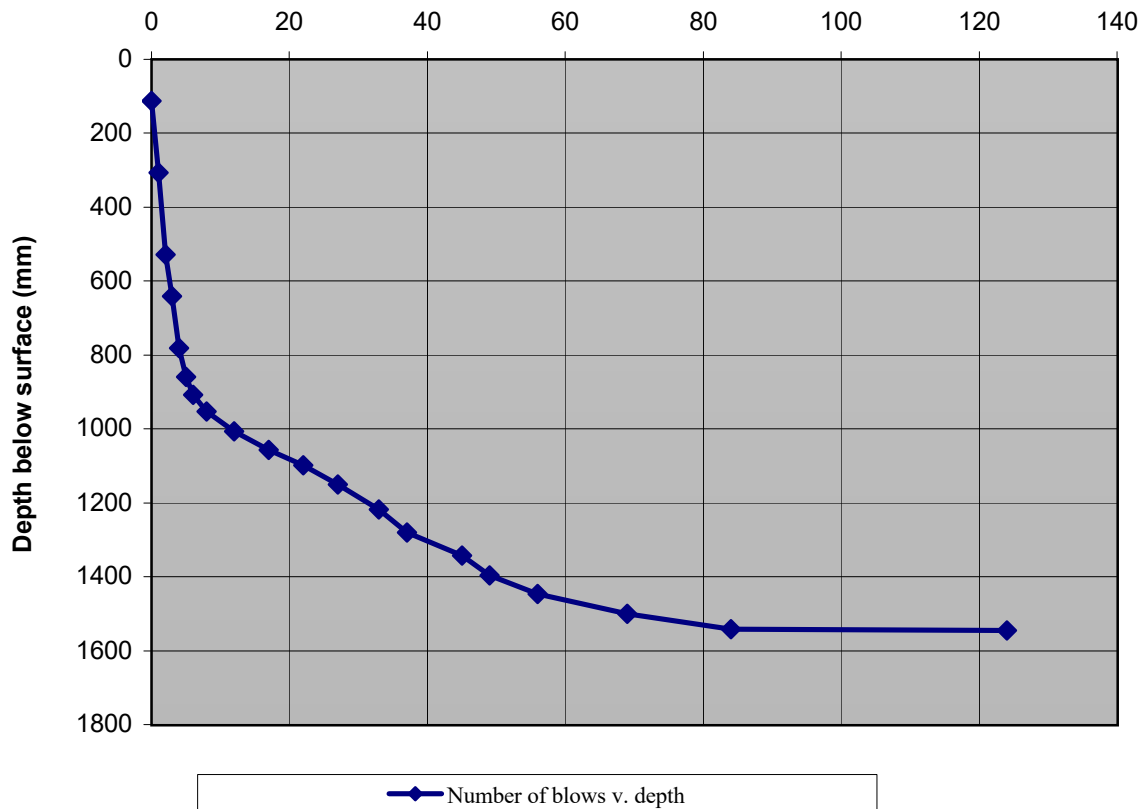
DCP No. 4

Weather Sunny, clear, cold

Zero Error (mm) 113

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
113	907	6	6	Topsoil	132.33	2
907	1280	37	31	Unknown	12.03	22
1280	1446	56	19	Unknown	8.74	31
1446	1542	84	28	Unknown	3.43	82
1542	1545	124	40	Unknown	0.08	4667

Remarks:

Cone Angle 60°

UKAS accredited test - No

Test stopped to add extension rods at a depth of 907mm

Test stopped at 1545mm due to refusal of equipment to further penetration

Originator

Checked & Approved

Dynamic Cone Penetrometer

IM

06/12/2023

In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB

Sheet 1 of 1



Site

LT520 BRACO WEST SUBSTATION

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Contract No 26555

Date tested 28.11.23

Test Location TP09

Tested by RF

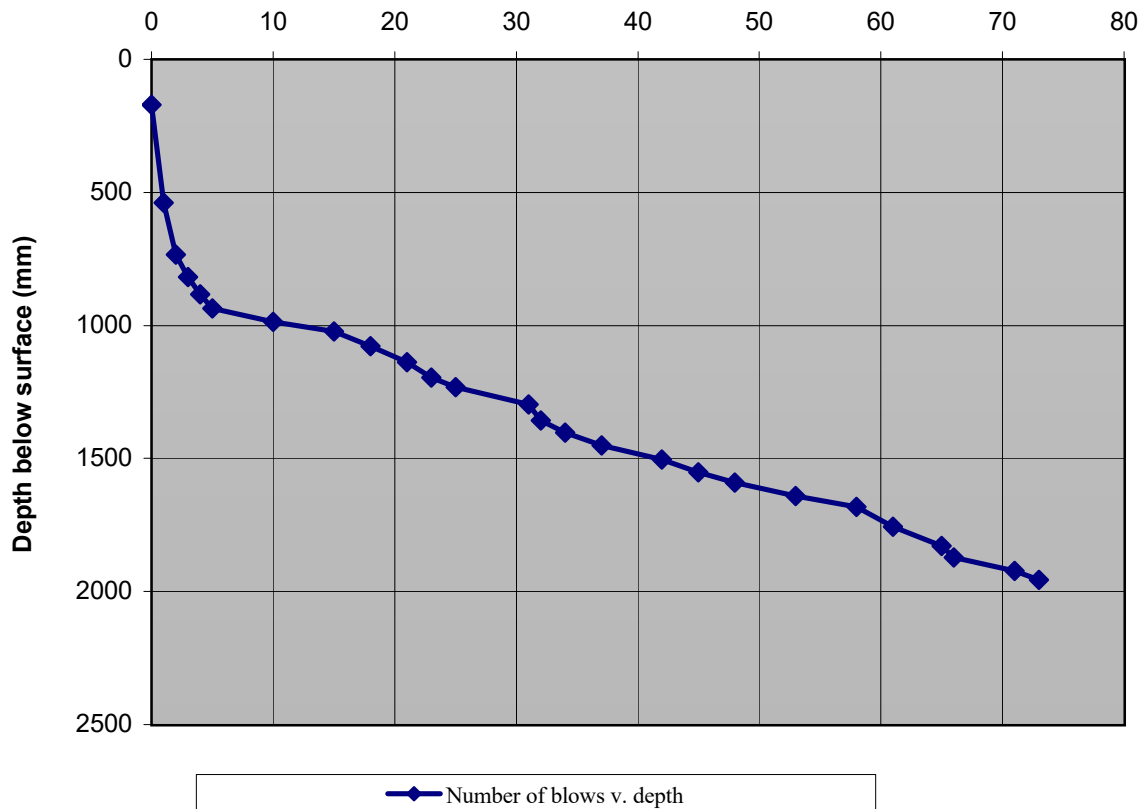
DCP No. 5

Weather Sunny, clear, cold

Zero Error (mm) 170

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
170	735	2	2	Topsoil	282.50	1
735	937	5	3	Unknown	67.33	4
937	1022	15	10	Unknown	8.50	31
1022	1297	31	16	Unknown	17.19	15
1297	1403	34	3	Unknown	35.33	7
1403	1681	58	24	Unknown	11.58	23
1681	1871	66	8	Unknown	23.75	11
1871	1957	73	7	Unknown	12.29	21

Remarks:

Cone Angle 60° UKAS accredited test - No

Test stopped to add extension rods at depths of 937mm and 1756mm

Test stopped at 1957mm due to refusal of equipment to further penetration

Originator	Checked & Approved	Dynamic Cone Penetrometer	
IM	IM 06/12/2023	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	



Site

LT520 BRACO WEST SUBSTATION

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Contract No 26555

Date tested 28.11.23

Test Location TP19

Tested by RF

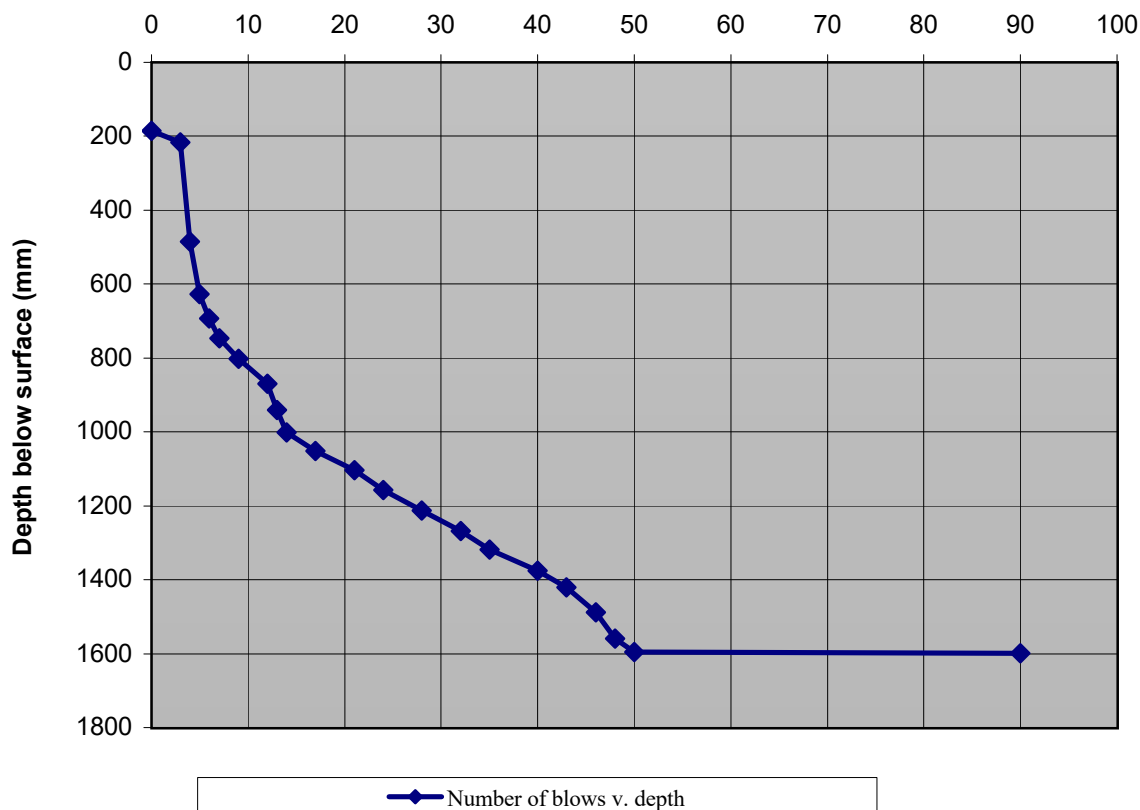
DCP No. 6

Weather Sunny, clear, cold

Zero Error (mm) 185

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
185	217	3	3	Topsoil	10.67	25
217	693	6	3	Unknown	158.67	1
693	870	12	6	Unknown	29.50	8
870	1001	14	2	Unknown	65.50	4
1001	1489	46	32	Unknown	15.25	17
1489	1596	50	4	Unknown	26.75	9
1596	1599	90	40	Unknown	0.08	4667

Remarks:

Cone Angle 60° UKAS accredited test - No

Test stopped to add extension rods at depths of 940mm

Test stopped at 1599mm due to refusal of equipment to further penetration

Originator	Checked & Approved	Dynamic Cone Penetrometer	
IM	IM 06/12/2023	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	



Site

LT520 BRACO WEST SUBSTATION

Contract No 26555

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Date tested 28.11.23

Test Location TP20

Tested by RF

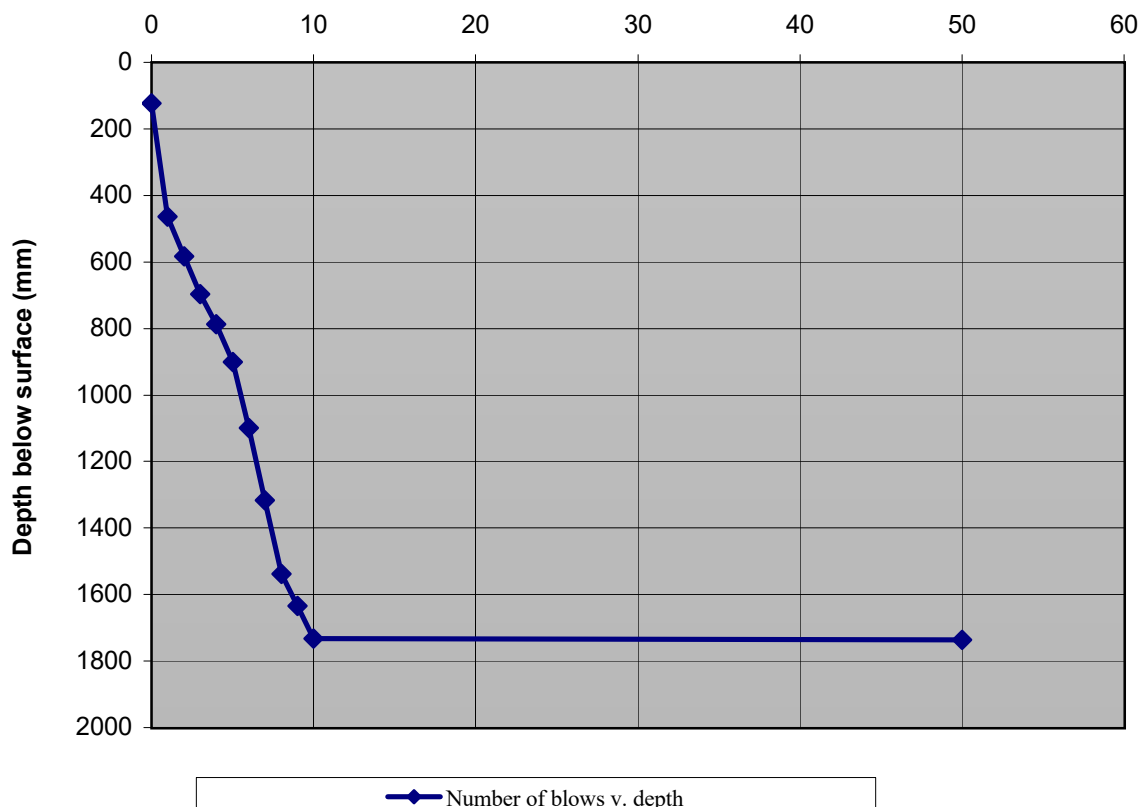
DCP No. 7

Weather Sunny, clear, cold

Zero Error (mm) 124

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
124	464	1	1	Topsoil	340.00	1
464	900	5	4	Unknown	109.00	2
900	1538	8	3	Unknown	212.67	1
1538	1733	10	2	Unknown	97.50	2
1733	1736	50	40	Unknown	0.08	4667

Remarks:

Cone Angle 60°

UKAS accredited test - No

Test stopped to add extension rods at a depth of 900mm

Test stopped at 1736mm due to refusal of equipment to further penetration

Originator

Checked & Approved

Dynamic Cone Penetrometer

IM

06/12/2023

In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB

Sheet 1 of 1



Site

LT520 BRACO WEST SUBSTATION

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Contract No 26555

Date tested 28.11.23

Test Location TP21

Tested by RF

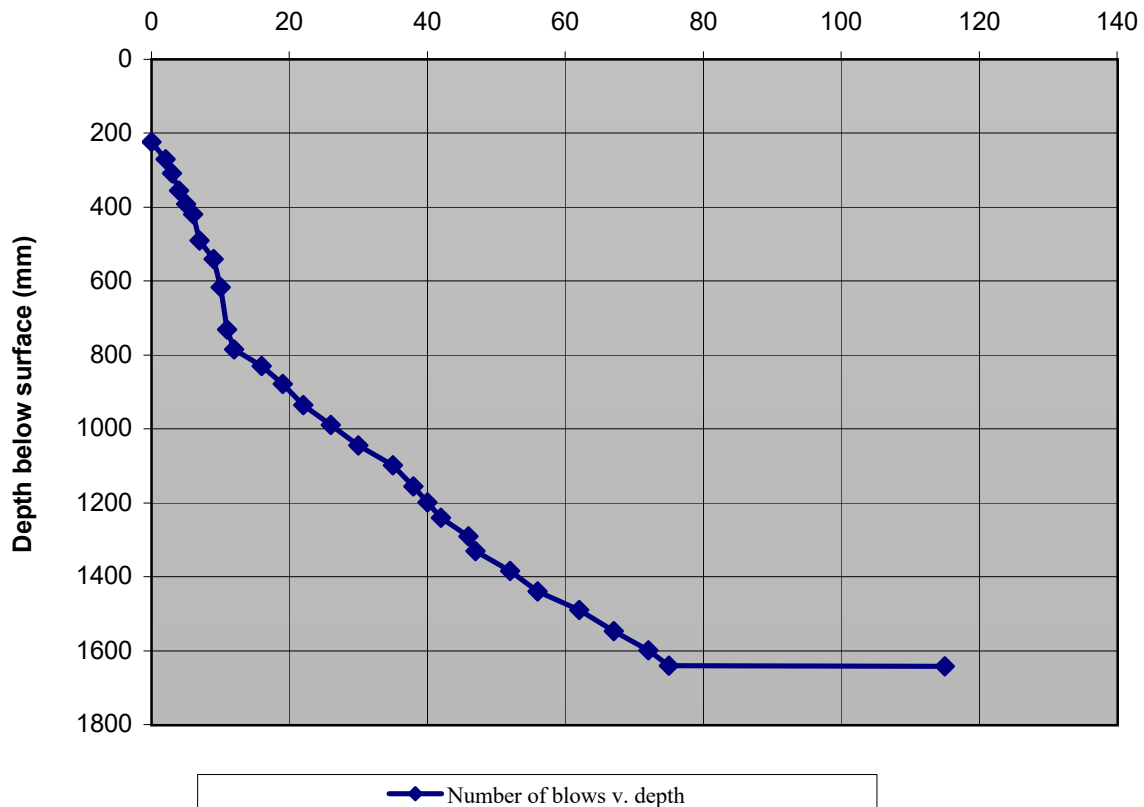
DCP No. 8

Weather Sunny, clear, cold

Zero Error (mm) 223

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
223	541	9	9	Topsoil	35.33	7
541	784	12	3	Unknown	81.00	3
784	1331	47	35	Unknown	15.63	17
1331	1640	75	28	Unknown	11.04	24
1640	1642	115	40	Unknown	0.05	7165

Remarks:

Cone Angle 60°

UKAS accredited test - No

Test stopped to add extension rods at a depth of 805mm

Test stopped at 1642mm due to refusal of equipment to further penetration

Originator

Checked & Approved

Dynamic Cone Penetrometer

IM

06/12/2023

In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB

Sheet 1 of 1



Site

LT520 BRACO WEST SUBSTATION

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Contract No 26555

Date tested 28.11.23

Test Location TP22

Tested by RF

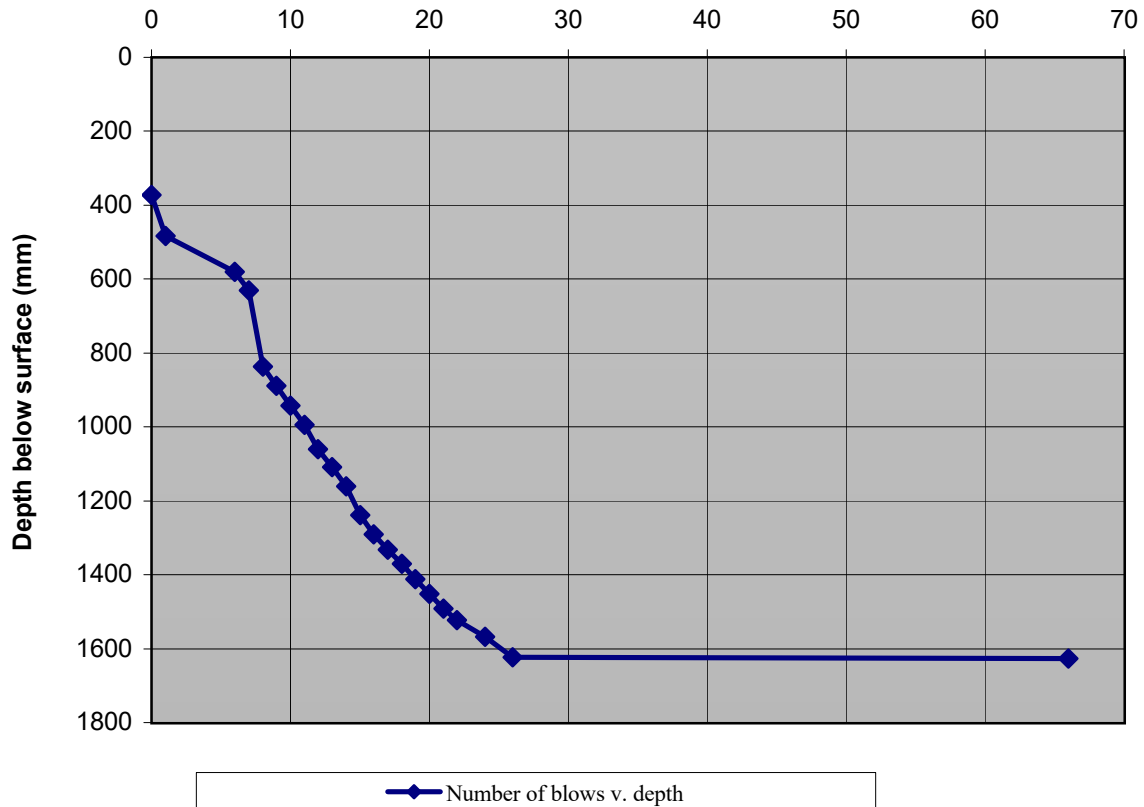
DCP No. 9

Weather Sunny, clear, cold

Zero Error (mm) 372

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
372	484	1	1	Topsoil	112.00	2
484	580	6	5	Unknown	19.20	13
580	837	8	2	Unknown	128.50	2
837	1160	14	6	Unknown	53.83	4
1160	1523	22	8	Unknown	45.38	5
1523	1623	26	4	Unknown	25.00	10
1623	1626	66	40	Unknown	0.08	4667

Remarks:

Cone Angle 60° UKAS accredited test - No

Test stopped to add extension rods at a depth of 837mm

Test stopped at 1626mm due to refusal of equipment to further penetration

Originator	Checked & Approved	Dynamic Cone Penetrometer	
IM	IM 06/12/2023	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	



Site

LT520 BRACO WEST SUBSTATION

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Contract No 26555

Date tested 28.11.23

Test Location TP23

Tested by RF

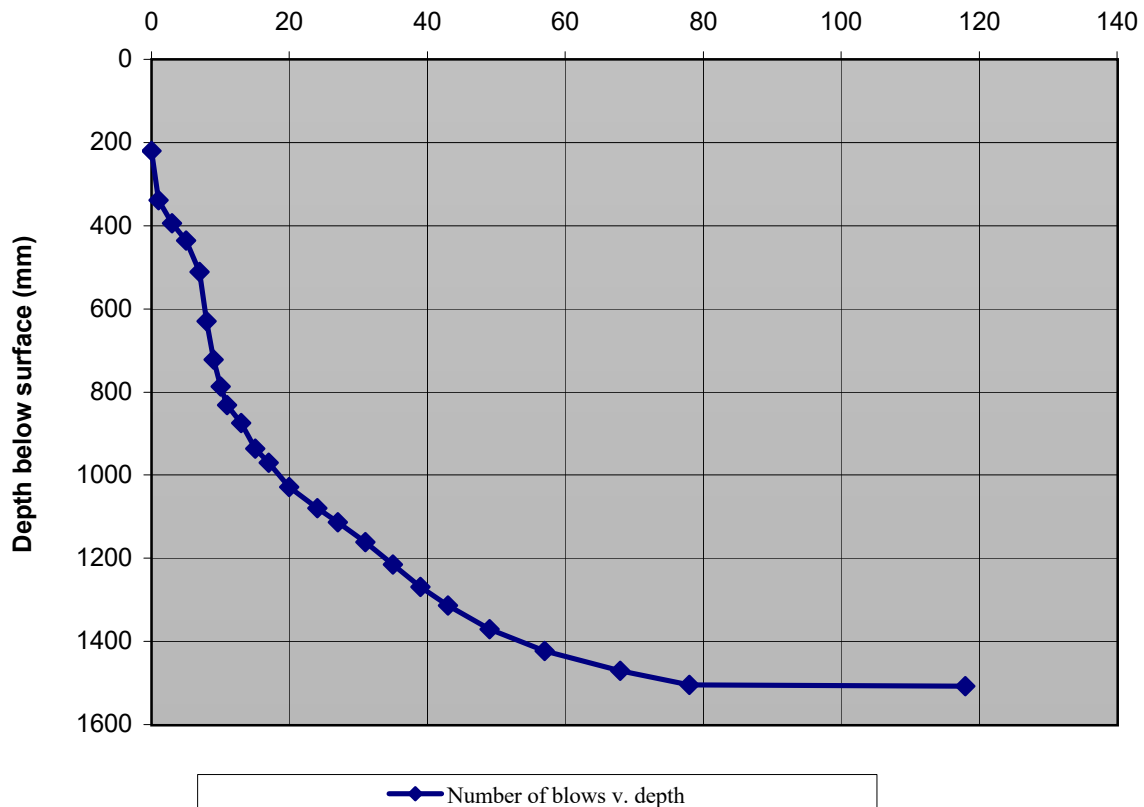
DCP No. 10

Weather Sunny, clear, cold

Zero Error (mm) 220

DYNAMIC CONE PENETROMETER GRAPH

Number of Blows



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
220	339	1	1	Topsoil	119.00	2
339	512	7	6	Unknown	28.83	9
512	832	11	4	Unknown	80.00	3
832	1028	20	9	Unknown	21.78	12
1028	1423	57	37	Unknown	10.68	25
1423	1505	78	21	Unknown	3.90	72
1505	1508	118	40	Unknown	0.08	4667

Remarks:

Cone Angle 60° UKAS accredited test - No

Test stopped to add extension rods at a depth of 832mm

Test stopped at 1508mm due to refusal of equipment to further penetration

Originator	Checked & Approved	Dynamic Cone Penetrometer	
IM	IM 06/12/2023	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	



Site: LT520 BRACO WEST SUBSTATION	Contract No: 26555
Client: SHE Transmission plc	
Engineer: SSE Perth Inveralmond HSE	



APPENDIX E
MONITORING



Style: SPIPE MONITORING File: P:\GINTW\PROJECTS\26555.GPJ Printed: 26/01/2024 17:02:31 Raeburn Drilling and Geotechnical Whistlerry Rd, Hamilton ML3 0HP Tel: 01898-711177 E-mail: enquiries@raeburndrilling.com

<div>RAEBURN</div> <div>DRILLING & GEOTECHNICAL LTD</div>				Site: LT520 BRACO WEST SUBSTATION									Contract No: 26555		
				Client: SHE Transmission plc Engineer: SSE Perth Inveralmond HSE									* Water level measurements taken from ground level.		
Borehole No.	Surveyed Level (m OD)	Depth to Base of Standpipe (m)	Date /Time	Atmospheric Pressure (mBar)	Gas Composition					Differential Pressure (Pa)	Flow (l/hr)	Depth to Water (m) (mBGL)	Depth (mOD)	Remarks	
					CH ₄ (%vol)	CO ₂ (%vol)	O ₂ (%vol)	H ₂ S (ppm)	CO (ppm)						
BH01	227.89		23/01/24 09:00	969	0.00	0.00	19.40	0.00	0.00	-8.00	-1.80	2.44	225.45	Dry, Overcast	
	227.89		23/01/24 09:01		0.00	0.10	19.50	0.00	1.00					Dry, Overcast	
	227.89		23/01/24 09:02		0.00	0.00	19.40	0.00	0.00					Dry, Overcast	
	227.89		23/01/24 09:03		0.00	0.00	19.40	0.00	0.00					Dry, Overcast	
	227.89		23/01/24 09:04		0.00	0.00	19.40	0.00	0.00					Dry, Overcast	
	227.89		23/01/24 09:05		0.00	0.00	19.40	0.00	0.00		-1.80			Dry, Overcast	
BH02	249.18		23/01/24 09:00	965	0.00	0.00	18.60	0.00	0.00	-4.00	-0.80	4.78	244.40	Dry, Overcast	
	249.18		23/01/24 09:01		0.00	0.00	19.40	0.00	0.00					Dry, Overcast	
	249.18		23/01/24 09:02		0.00	0.10	19.30	0.00	0.00					Dry, Overcast	
	249.18		23/01/24 09:03		0.00	0.10	19.10	0.00	0.00					Dry, Overcast	
	249.18		23/01/24 09:04		0.00	0.10	18.90	0.00	0.00					Dry, Overcast	
	249.18		23/01/24 09:05		0.00	0.10	18.80	0.00	1.00		-0.70			Dry, Overcast	
BH04	252.35		23/01/24 09:00	962	0.00	0.20	19.30	0.00	1.00	-6.00	-1.30	Dry		Overcast, raining	
	252.35		23/01/24 09:01		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	252.35		23/01/24 09:02		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	252.35		23/01/24 09:03		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	252.35		23/01/24 09:04		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	252.35		23/01/24 09:05		0.00	0.10	19.40	0.00	0.00		-1.30			Overcast, raining	
BH07	235.10		23/01/24 09:00	970	0.00	0.00	19.30	0.00	1.00	-22.00	-3.40	4.51	230.59	Dry, Overcast	
	235.10		23/01/24 09:01		0.00	0.10	19.40	0.00	0.00					Dry, Overcast	
	235.10		23/01/24 09:02		0.00	0.10	19.40	0.00	0.00					Dry, Overcast	
	235.10		23/01/24 09:03		0.00	0.10	19.40	0.00	1.00					Dry, Overcast	
	235.10		23/01/24 09:04		0.00	0.10	19.40	0.00	1.00					Dry, Overcast	
	235.10		23/01/24 09:05		0.00	0.10	19.30	0.00	0.00		-3.40			Dry, Overcast	
BH10	240.05		23/01/24 09:00	968	0.00	0.00	19.30	0.00	1.00	-22.00	-3.40	Dry		Dry, Overcast	
	240.05		23/01/24 09:01		0.00	0.00	19.40	0.00	1.00					Dry, Overcast	
	240.05		23/01/24 09:02		0.00	0.10	19.40	0.00	0.00					Dry, Overcast	
	240.05		23/01/24 09:03		0.00	0.10	19.30	0.00	0.00					Dry, Overcast	
	240.05		23/01/24 09:04		0.00	0.10	19.30	0.00	0.00					Dry, Overcast	
	240.05		23/01/24 09:05		0.00	0.10	19.30	0.00	0.00		-3.40			Dry, Overcast	
BH11 NEW	216.61		23/01/24 09:00	970	0.00	0.00	19.30	0.00	0.00	0.50	-1.20	1.02	215.59	Dry, Overcast	
	216.61		23/01/24 09:01		0.00	0.00	19.40	0.00	0.00					Dry, Overcast	
	216.61		23/01/24 09:02		0.00	0.00	19.40	0.00	0.00					Dry, Overcast	
	216.61		23/01/24 09:03		0.00	0.00	19.40	0.00	0.00					Dry, Overcast	
	216.61		23/01/24 09:04		0.00	0.10	19.40	0.00	0.00					Dry, Overcast	
	216.61		23/01/24 09:05		0.00	0.10	19.30	0.00	0.00		-1.20			Dry, Overcast	
BH13	259.53		23/01/24 09:00	963	0.00	0.20	19.00	0.00	1.00	-20.00	-3.30	Dry		Overcast, raining	
	259.53		23/01/24 09:01		0.00	0.10	19.40	0.00	0.00					Overcast, raining	
	259.53		23/01/24 09:02		0.00	0.10	19*.3	0.00	0.00					Overcast, raining	
	259.53		23/01/24 09:03		0.00	0.10	19.30	0.00	1.00					Overcast, raining	
	259.53		23/01/24 09:04		0.00	0.10	19.30	0.00	0.00					Overcast, raining	
	259.53		23/01/24 09:05		0.00	0.10	19.30	0.00	1.00		-3.30			Overcast, raining	
BH14 NEW	246.92		23/01/24 09:00	971	0.00	0.10	19.20	0.00	1.00	-25.00	-3.60	Dry		Dry, Overcast	
	246.92		23/01/24 09:01		0.00	0.10	19.40	0.00	1.00					Dry, Overcast	
Originator		Title:													
RB		RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES													
Status															
DRAFT															
Chk & App														RAEBURN	Fig No:
FMR															E1
Sheet 1 of 2															

Style: SPIPE MONITORING File: P:\GINTW\PROJECTS\26555.GPJ Printed: 26/01/2024 17:02:31 Raeburn Drilling and Geotechnical Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

				Site: LT520 BRACO WEST SUBSTATION							Contract No: 26555						
				Client: SHE Transmission plc Engineer: SSE Perth Inveralmond HSE							* Water level measurements taken from ground level.						
Borehole No.	Surveyed Level (m OD)	Depth to Base of Standpipe (m)	Date /Time	Atmospheric Pressure (mBar)	Gas Composition					Differential Pressure (Pa)	Flow (l/hr)	Depth to Water (m) (mBGL)	Depth (mOD)	Remarks			
					CH ₄ (%vol)	CO ₂ (%vol)	O ₂ (%vol)	H ₂ S (ppm)	CO (ppm)								
BH14 NEW	246.92		23/01/24 09:02		0.00	0.10	19.30	0.00	1.00					Dry, Overcast			
	246.92		23/01/24 09:03		0.00	0.10	19.30	0.00	2.00					Dry, Overcast			
	246.92		23/01/24 09:04		0.00	0.10	19.30	0.00	1.00					Dry, Overcast			
	246.92		23/01/24 09:05		0.00	0.10	19.30	0.00	2.00		-3.60			Dry, Overcast			
BH19	257.97		23/01/24 09:00	962	0.00	0.10	18.80	0.00	0.00	0.00	0.00	8.74	249.23	Overcast, raining			
	257.97		23/01/24 09:01		0.00	0.10	19.20	0.00	0.00					Overcast, raining			
	257.97		23/01/24 09:02		0.00	0.10	19.40	0.00	0.00					Overcast, raining			
	257.97		23/01/24 09:03		0.00	0.10	19.30	0.00	0.00					Overcast, raining			
	257.97		23/01/24 09:04		0.00	0.10	19.20	0.00	0.00					Overcast, raining			
	257.97		23/01/24 09:05		0.00	0.10	19.10	0.00	0.00		0.00			Overcast, raining			
Originator RB		Title: RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES												Fig No:			
Chk & App														Status		E1	
FMR														DRAFT		Sheet 2 of 2	

TEST

STANDARD

CLASSIFICATION TESTS

Determination of water content	BS EN ISO 17892-1:2014
Determination of liquid limit	BS 1377 : 1990 : Part 2 : 4.3 and 4.4
Determination of liquid and plastic limits	BS EN ISO 17892-12:2018
Determination of bulk density	BS EN ISO 17892-2:2014
Determination of particle density	BS EN ISO 17892-3:2016
Determination of particle size distribution	BS EN ISO 17892-4:2016

CHEMICAL TESTS

Determination of organic matter content	BS 1377 : 1990 : Part 3 : 3.4
Determination of mass loss on ignition	BS 1377 : 1990 : Part 3 : 4.3
Determination of sulphate content of soil and groundwater	BS 1377 : 1990 : Part 3 : 5.2, 5.3 and 5.5
Determination of chloride content	BS 1377 : 1990 : Part 3 : 7.2 and 7.3
Determination of pH value	BS 1377 : 1990 : Part 3 : 9.5

COMPACTION-RELATED TESTS

Determination of dry density/moisture content relationship	BS 1377 : 1990 : Part 4 : 3.3 to 3.6
Determination of moisture condition value (MCV)	SDD Tech Memo SH7/83; SDD Appls Guide No.1 Rev. 1989
Determination of California Bearing Ratio (CBR)	BS 1377 : 1990 : Part 4 : 7.4

CONSOLIDATION AND STRENGTH TESTS

Incremental loading oedometer test	BS EN ISO 17892-5:2017
Unconfined compression test	BS EN ISO 17892-7:2018
Unconsolidated undrained triaxial test	BS EN ISO 17892-8:2018
Consolidated triaxial compression tests on water saturated soils	BS EN ISO 17892-9:2018
Lab Vane Tests	BS 1377 : 1990
Direct shear tests	BS EN ISO 17892-10:2019
Permeability tests	BS EN ISO 17892-11:2019
Fall cone test	BS EN ISO 17892-6:2017

ROCK TESTS

Determination of point load strength	ISRM Commission on Testing Methods, 1985
Determination of unconfined compressive strength	ASTM D7012-14
LA Abrasion Tests	BS EN 1097-2:2010 and BS 818 : Part 2 : 1990
Magnesium Soundness Tests	BS EN 1367-2
Slake durability	ISRM Suggested methods
Rock porosity / density	ISRM Suggested methods

Raeburn (Trading as igne) Hamilton


Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-1

Issue No 01

LABORATORY TEST REPORT




Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-1	Date samples received	12/12/2023
Your Ref	26555	Date written instructions received	29/11/2023
Purchase Order	26555	Date testing commenced	15/12/2023
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	12	Determination of Water Content	Yes
	4	Atterberg Limit	Yes
	12	Particle Size Distribution	Yes
	1	Moisture Content / Dry Density Relationship	Yes
	5	Moisture Condition Value	Yes
	1	California Bearing Ratio	Yes
	2	Shear Strength by Direct Shear	Yes
	1	Resistance to Fragmentation by Los Angeles Method	Yes
	4	Chemical Analysis	s/c - Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 18/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  18/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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www.igne.com



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

Head Office : Whistleberry Road, Hamilton, Glasgow, Scotland, ML3 0HP

				Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
				Client SHE Transmission plc			
				Engineer SSE Perth Inveralmond HSE			
Sample Identification				Lab Sample ID	Non Engineering Description	Water Content %	
Exploratory Hole	Depth m	Sample Ref	Sample Type				
TP01	0.60		B	2012712	Brown silty sandy fine to coarse GRAVEL with cobbles	15.2	
TP01	0.60		D	2012711	Brown silty sandy fine to coarse GRAVEL	14.1	
TP03	0.60		B	2012714	Brown silty very sandy fine to coarse GRAVEL	16.6	
TP03	0.60		D	2012713	Brown silty very sandy fine to coarse GRAVEL	21.3	
TP03	1.30		D	2012715	Brown silty SAND and GRAVEL. Gravel is fine to coarse	14.4	
TP06	1.00		D	2012718	Brown silty very sandy fine to coarse GRAVEL	13.0	
TP08	1.00		B	2012721	Brown silty very gravelly SAND. Gravel is fine to coarse	17.1	
TP08	1.00		D	2012719	Brown silty very gravelly SAND. Gravel is fine to coarse	18.8	
TP21	1.00		D	2012723	Brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse	17.9	
TP21	1.50		B	2012725	Brown slightly gravelly slightly sandy CLAY with cobbles. Gravel is fine to coarse	14.0	
TP21	1.50		D	2012724	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse	16.4	
TP22	0.50		D	2012727	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse	17.4	
TP22	1.00		B	2012730	Brown very clayey SAND and GRAVEL. Gravel is fine to coarse	15.1	
TP22	1.00		D	2012728	Brown very clayey SAND and GRAVEL. Gravel is fine to coarse	13.1	
Notes							
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014				
TP	 18/01/2024						
						Sheet 1 of 2	

Version 026 - 01/09/2023
1212 - Moisture Content Table - A15044-1.xls

62 Rochsolloch Road, Airdrie, ML6 9BG
Lab Project No A15044-1 : 18/01/2024 12:29:52

				SiteLT520 BRACO WEST SUBSTATION		Contract No26555	
				ClientSHE Transmission plc			
				EngineerSSE Perth Inveralmond HSE			
Sample Identification							
Exploratory Hole	Depth m	Sample Ref	Sample Type				
TP22	2.00		D	2012731	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse	12.0	
TP23	0.90		D	2012734	Brown gravelly silty SAND. Gravel is fine to coarse	30.6	
TP23	1.25		B	2012737	Brown silty very gravelly SAND. Gravel is fine to coarse	15.6	
TP23	1.25		D	2012735	Brown silty very gravelly SAND. Gravel is fine to coarse	16.7	
Notes							
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014				
TP	CD 18/01/2024						
						Sheet 2 of 2	



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No. 26555

Hole ID TP21

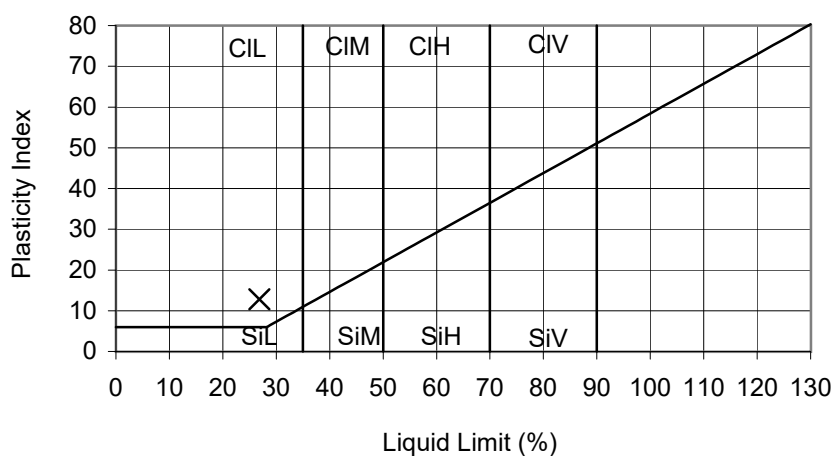
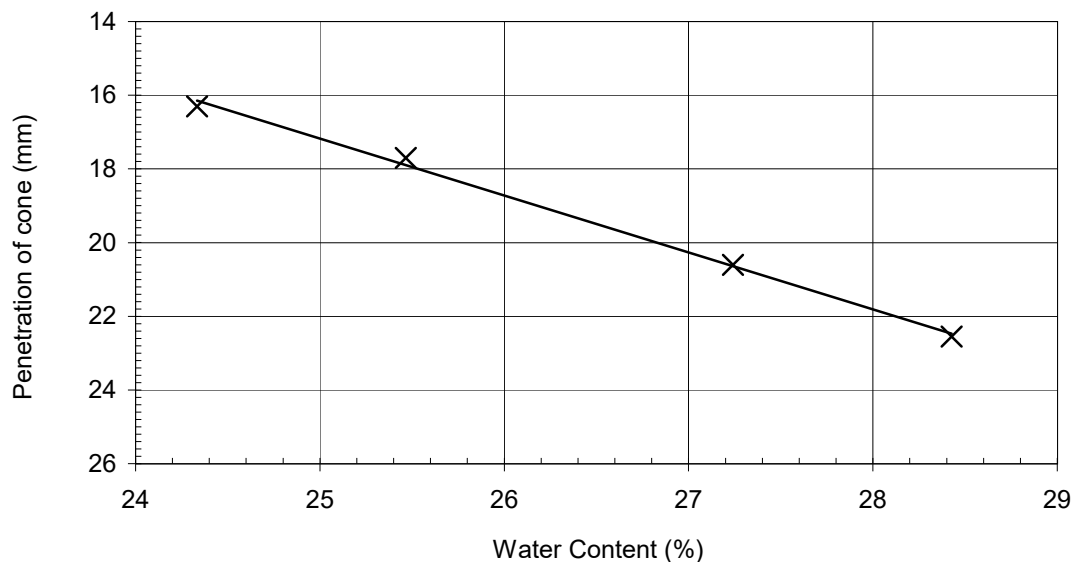
Sample Ref

Depth (m) 1.50

Sample Type D

Non Engineering Description : Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 16.4 %
 Percentage retained on 425µm sieve : 36 %
 Liquid Limit : 27 %
 Plastic Limit : 14 %
 Plasticity Index : 13

Equivalent water content of material passing 425µm sieve : 25.6 %

Liquidity Index : 0.89

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	 18/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No. 26555

Hole ID TP22

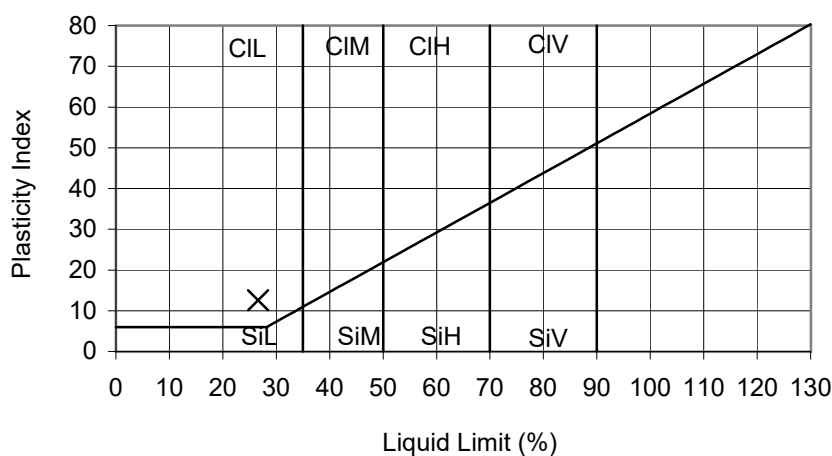
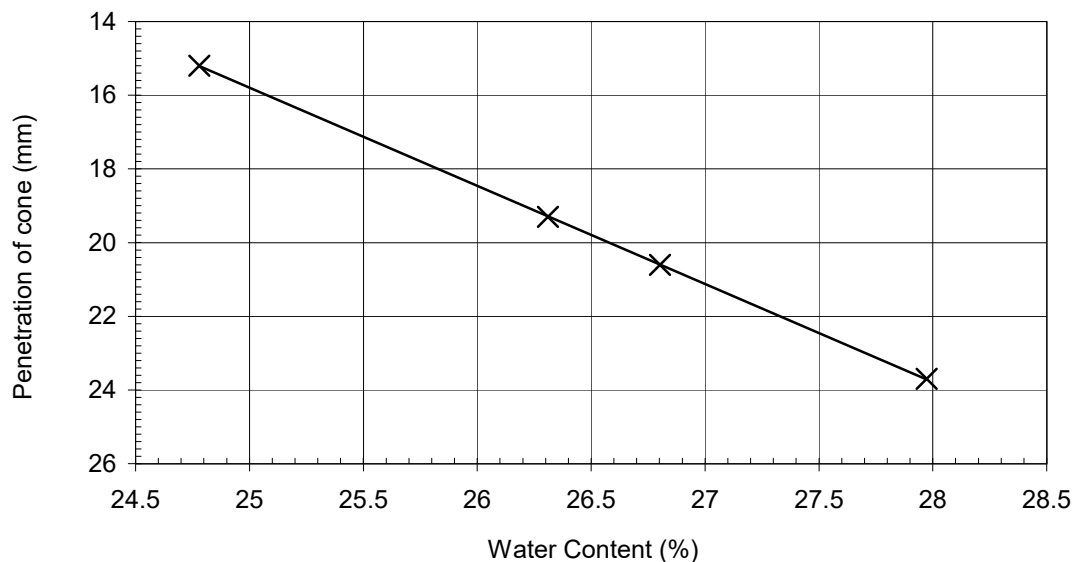
Sample Ref

Depth (m) 0.50

Sample Type D

Non Engineering Description : Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 17.4 %
 Percentage retained on 425µm sieve : 42 %
 Liquid Limit : 27 %
 Plastic Limit : 14 %
 Plasticity Index : 13

Equivalent water content of material passing 425µm sieve : 30.0 %

Liquidity Index : 1.23

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	 18/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No. 26555

Hole ID TP22

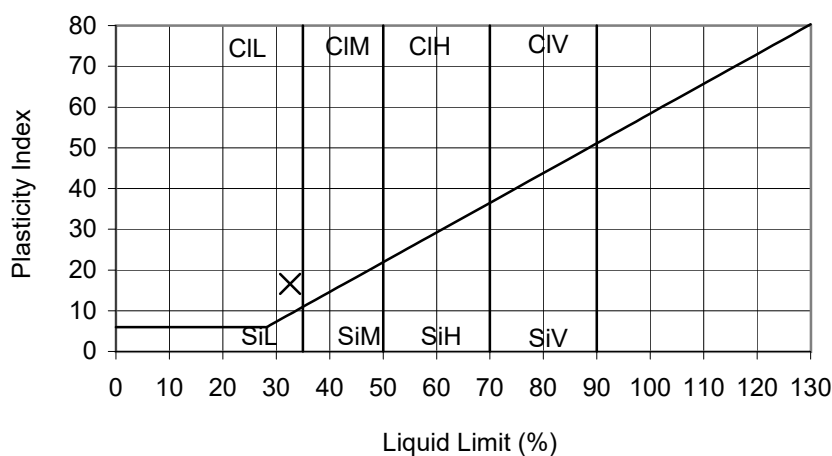
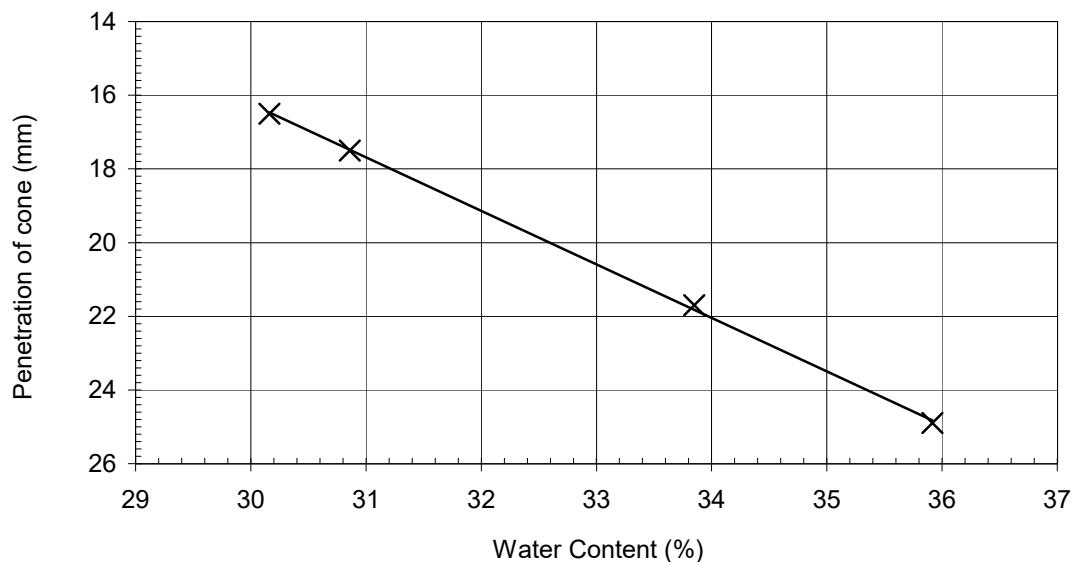
Sample Ref

Depth (m) 1.00

Sample Type D

Non Engineering Description : Brown very clayey SAND and GRAVEL. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 13.1 %
 Percentage retained on 425µm sieve : 49 %
 Liquid Limit : 33 %
 Plastic Limit : 16 %
 Plasticity Index : 17

Equivalent water content of material passing 425µm sieve : 25.7 %

Liquidity Index : 0.57

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	 18/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No. 26555

Hole ID TP22

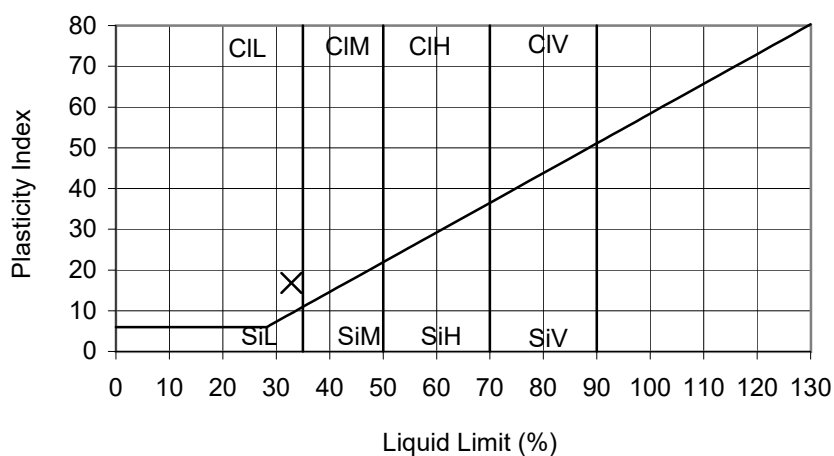
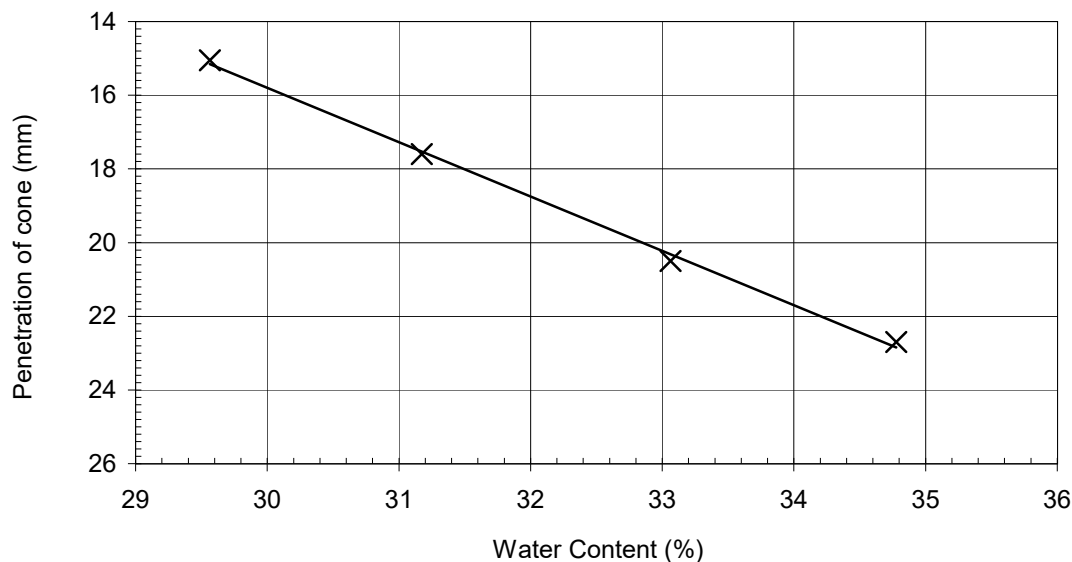
Sample Ref

Depth (m) 2.00

Sample Type D

Non Engineering Description : Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Liquid Limit was determined by mixing using increasing water content and 30° cone


Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 12.0 %
 Percentage retained on 425µm sieve : 39 %
 Liquid Limit : 33 %
 Plastic Limit : 16 %
 Plasticity Index : 17

Equivalent water content of material passing 425µm sieve : 19.7 %

Liquidity Index : 0.22

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	 18/01/2024		

	SiteLT520 BRACO WEST SUBSTATION		Contract No26555	
	ClientSHE Transmission plc		HoleTP01	
	EngineerSSE Perth Inveralmond HSE		Sample Ref Depth (m)0.60 Sample TypeB	


Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	89
63.0 mm	89
50.0 mm	79
37.5 mm	73
28.0 mm	67
20.0 mm	60
14.0 mm	50
10.0 mm	44
6.30 mm	37
5.00 mm	35
3.35 mm	31
2.00 mm	29
1.18 mm	27
630 µm	24
425 µm	22
300 µm	20
200 µm	18
150 µm	16
63 µm	10
20 µm	6
6 µm	3
2 µm	2

Non Engineering Description	
Brown silty sandy fine to coarse GRAVEL with cobbles	


Sample Proportions - %	
Cobbles	11.3
Gravel	59.6
Sand	19.1
Silt	8.4
Clay	1.6
Particle Density - Assumed (Mg/m3)2.65	
Particle Diameter - mm	
D100	90
D60	20
D10	0.058
Uniformity Coefficient <small>(SHW series 600, Table 6/1, footnote 5)</small>	
344.8	

Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
MC	CD 18/01/2024		

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	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP03	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 0.60 Sample Type B	

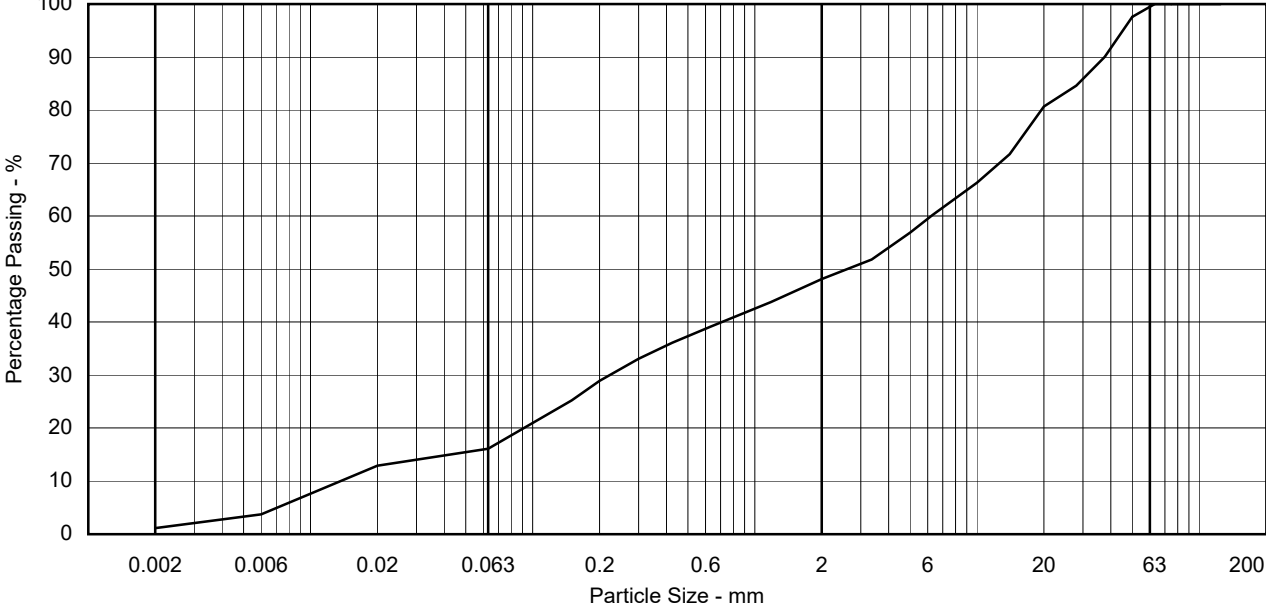
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	98
37.5 mm	90
28.0 mm	85
20.0 mm	81
14.0 mm	72
10.0 mm	66
6.30 mm	60
5.00 mm	57
3.35 mm	52
2.00 mm	48
1.18 mm	44
630 µm	39
425 µm	36
300 µm	33
200 µm	29
150 µm	25
63 µm	16
20 µm	13
6 µm	4
2 µm	1

Non Engineering Description	
Brown silty very sandy fine to coarse GRAVEL	

Sample Proportions - %	
Cobbles	0.0
Gravel	51.9
Sand	32.2
Silt	14.8
Clay	1.1
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	6.2
D10	0.014
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 442.9	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			




Percentage Passing - %

Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
MC	CD 18/01/2024		

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SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP03

Sample Ref

Depth (m)1.30

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	98
50.0 mm	95
37.5 mm	94
28.0 mm	92
20.0 mm	89
14.0 mm	85
10.0 mm	81
6.30 mm	74
5.00 mm	70
3.35 mm	63
2.00 mm	58
1.18 mm	53
630 µm	47
425 µm	43
300 µm	40
200 µm	36
150 µm	33
63 µm	19
20 µm	11
6 µm	7
2 µm	3

Non Engineering Description

Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse

Sample Proportions - %

Cobbles	1.6
Gravel	40.4
Sand	39.8
Silt	14.8
Clay	3.3

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	75
D60	2.5
D10	0.013

Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)192.3

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %

Particle Size - mm

Originator

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



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	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP06	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.00 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	97
37.5 mm	92
28.0 mm	88
20.0 mm	86
14.0 mm	79
10.0 mm	71
6.30 mm	63
5.00 mm	59
3.35 mm	55
2.00 mm	50
1.18 mm	46
630 µm	41
425 µm	36
300 µm	30
200 µm	23
150 µm	18
63 µm	16
20 µm	11
6 µm	7
2 µm	4

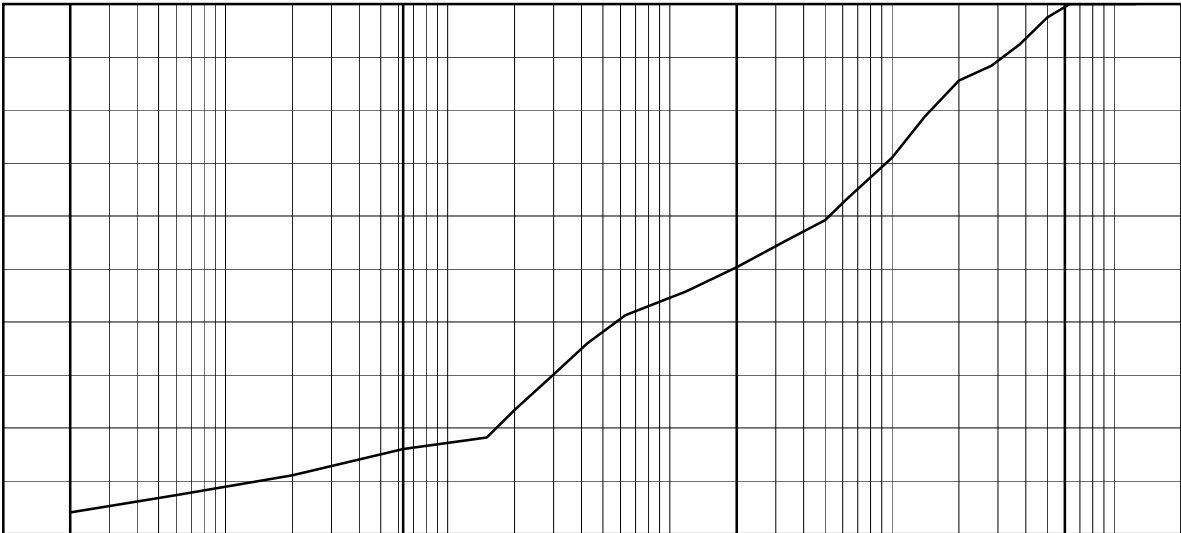
Non Engineering Description	
Brown silty very sandy fine to coarse GRAVEL	

Sample Proportions - %	
Cobbles	0.0
Gravel	49.6
Sand	34.7
Silt	11.6
Clay	4.0
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	5.2
D10	0.014
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 371.4	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
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	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP08	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.00 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	99
20.0 mm	97
14.0 mm	94
10.0 mm	91
6.30 mm	86
5.00 mm	84
3.35 mm	79
2.00 mm	72
1.18 mm	63
630 µm	53
425 µm	48
300 µm	44
200 µm	39
150 µm	34
63 µm	20
20 µm	11
6 µm	8
2 µm	3

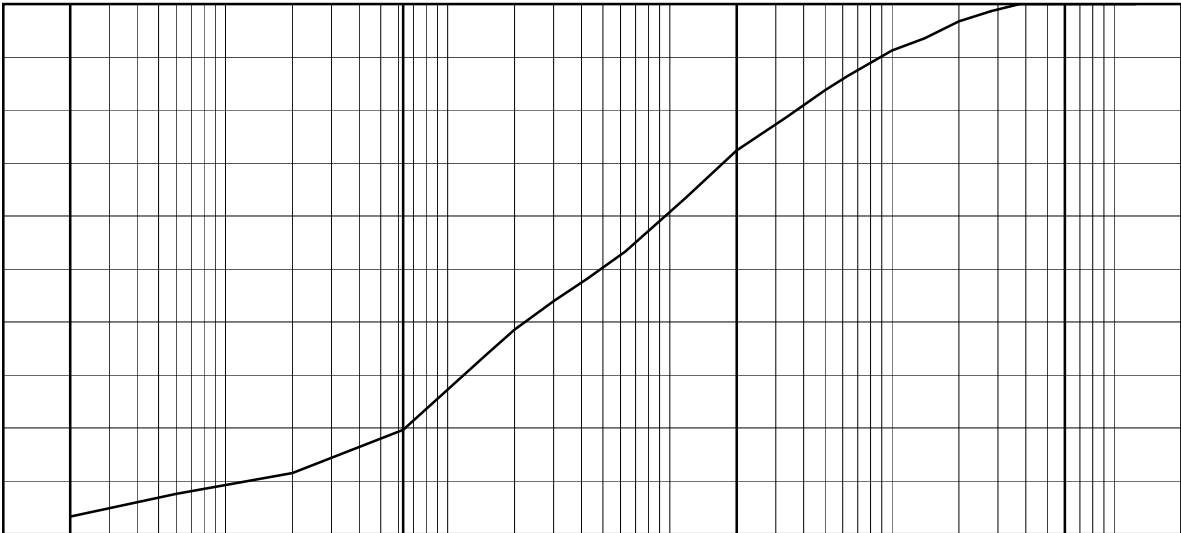
Non Engineering Description	
Brown silty very gravelly SAND. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	27.6
Sand	53.3
Silt	15.8
Clay	3.3
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	38
D60	0.95
D10	0.013
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 73.1	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
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SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP21

Sample Ref

Depth (m)1.00

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	97
37.5 mm	94
28.0 mm	88
20.0 mm	87
14.0 mm	85
10.0 mm	82
6.30 mm	79
5.00 mm	78
3.35 mm	74
2.00 mm	71
1.18 mm	69
630 µm	67
425 µm	64
300 µm	62
200 µm	57
150 µm	53
63 µm	42
20 µm	30
6 µm	22
2 µm	12

Non Engineering Description

Brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse

Sample Proportions - %

Cobbles	0.0
Gravel	29.4
Sand	29.3
Silt	29.4
Clay	11.9

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	63
D60	0.25
D10	

Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)

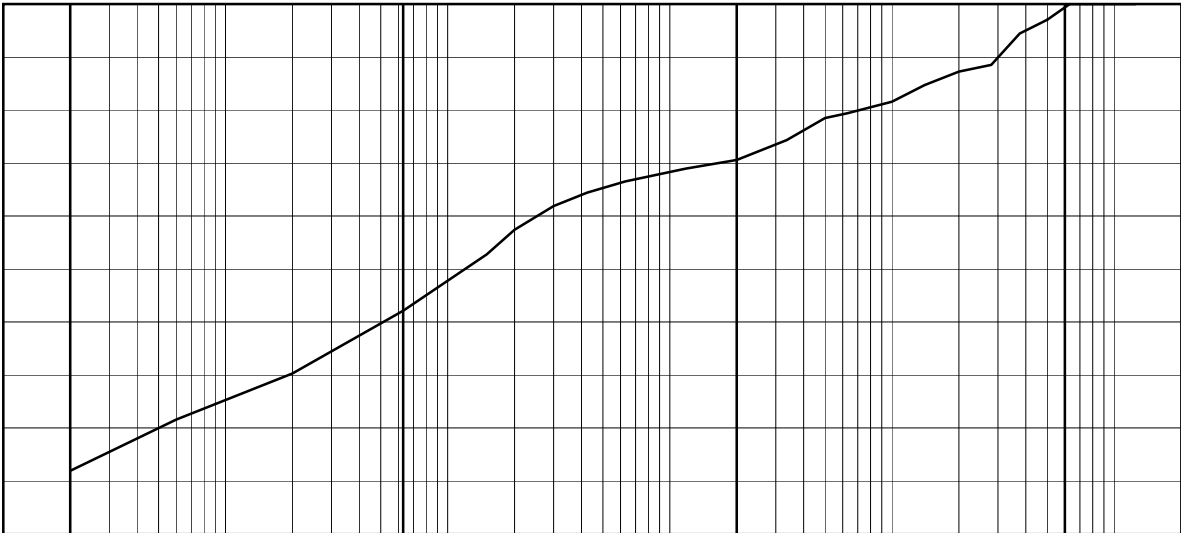
N/A

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt			Sand			Gravel				

Percentage Passing - %



Particle Size - mm

Originator

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PARTICLE SIZE DISTRIBUTION

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BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



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SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP21

Sample Ref

Depth (m)1.50

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	93
63.0 mm	93
50.0 mm	88
37.5 mm	85
28.0 mm	80
20.0 mm	78
14.0 mm	76
10.0 mm	73
6.30 mm	71
5.00 mm	70
3.35 mm	69
2.00 mm	68
1.18 mm	67
630 µm	65
425 µm	64
300 µm	62
200 µm	59
150 µm	56
63 µm	45
20 µm	33
6 µm	23
2 µm	13

Non Engineering Description

Brown slightly gravelly slightly sandy CLAY with cobbles.
Gravel is fine to coarse

Sample Proportions - %

Cobbles	6.6
Gravel	25.3
Sand	23.6
Silt	31.7
Clay	12.9

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	90
D60	0.23
D10	

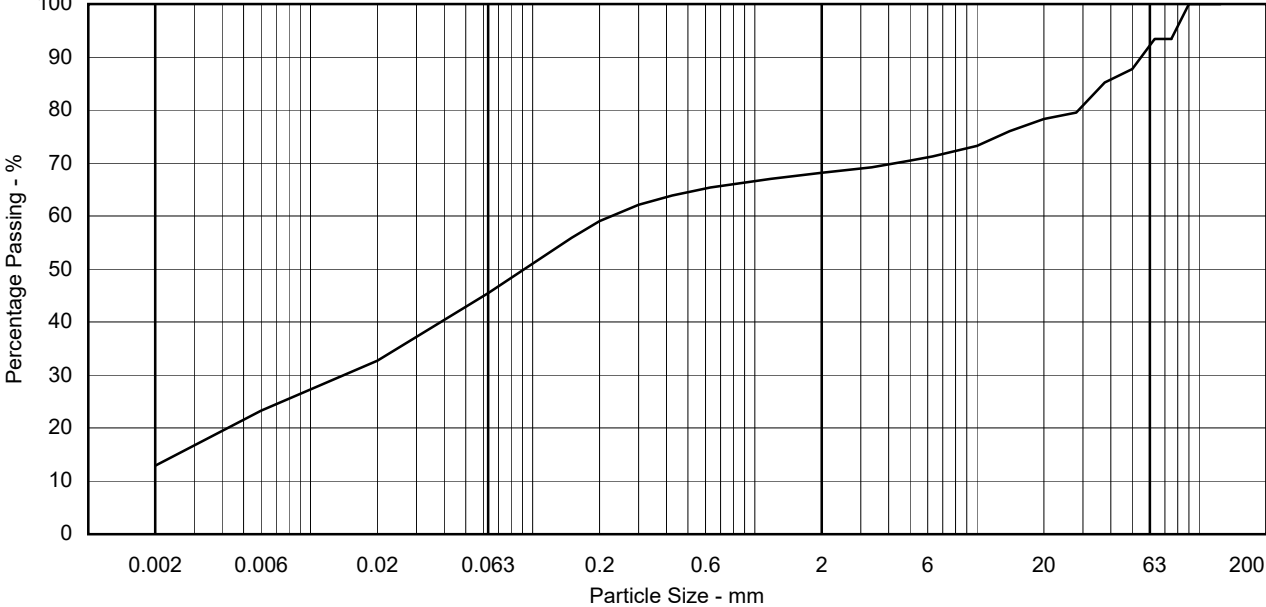
Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)N/A

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt			Sand			Gravel				

Percentage Passing - %



Particle Size - mm

Originator

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



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SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP22

Sample Ref

Depth (m)0.50

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	98
28.0 mm	97
20.0 mm	94
14.0 mm	90
10.0 mm	84
6.30 mm	78
5.00 mm	76
3.35 mm	74
2.00 mm	71
1.18 mm	66
630 µm	62
425 µm	58
300 µm	52
200 µm	45
150 µm	40
63 µm	36
20 µm	26
6 µm	18
2 µm	10

Non Engineering Description

Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse

Sample Proportions - %

Cobbles	0.0
Gravel	29.4
Sand	34.9
Silt	25.3
Clay	10.3

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	50
D60	0.52
D10	

Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)

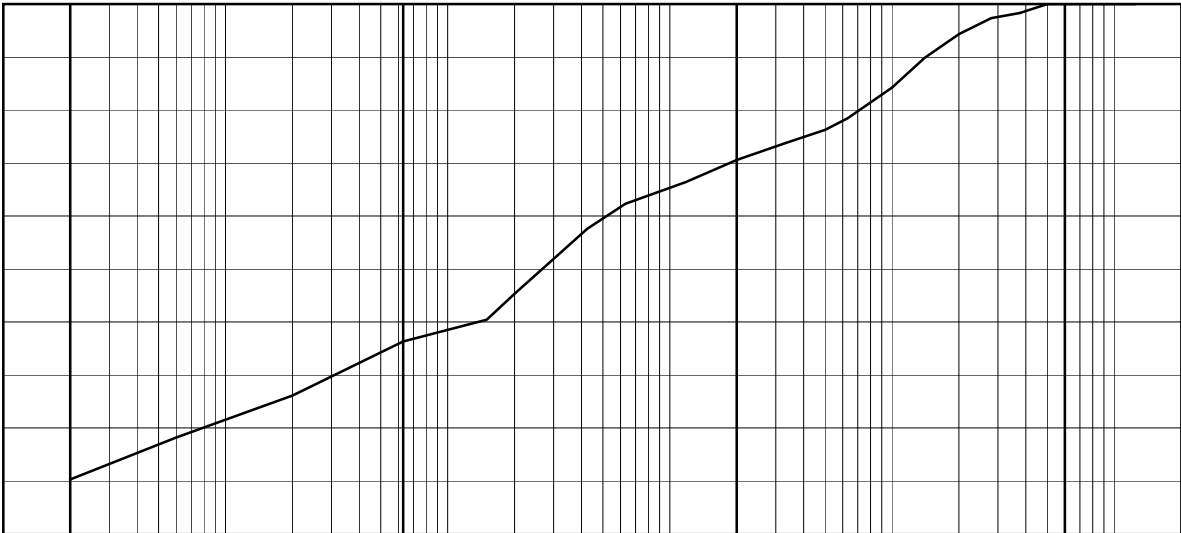
N/A

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt			Sand			Gravel				

Percentage Passing - %



Particle Size - mm

Originator

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

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SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP22

Sample Ref

Depth (m)1.00

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	92
37.5 mm	91
28.0 mm	90
20.0 mm	87
14.0 mm	83
10.0 mm	78
6.30 mm	72
5.00 mm	70
3.35 mm	68
2.00 mm	65
1.18 mm	61
630 µm	57
425 µm	51
300 µm	43
200 µm	39
150 µm	34
63 µm	32
20 µm	25
6 µm	21
2 µm	14

Non Engineering Description

Brown very clayey SAND and GRAVEL. Gravel is fine to coarse

Sample Proportions - %

Cobbles	0.0
Gravel	35.3
Sand	33.4
Silt	17.8
Clay	13.5

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	63
D60	1.1
D10	

Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)

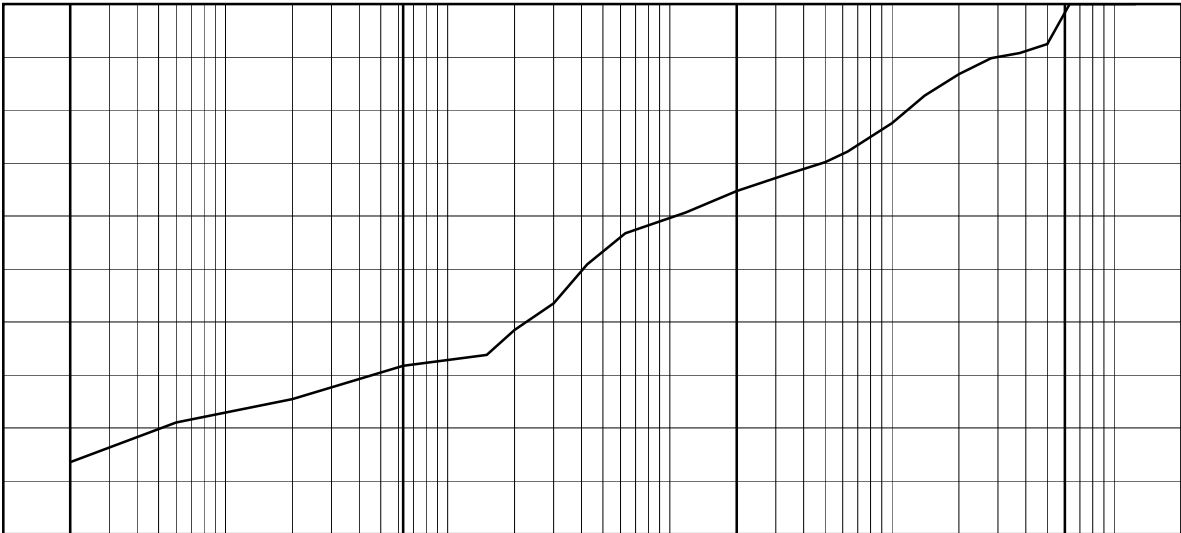
N/A

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



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SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP22

Sample Ref

Depth (m)2.00

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	97
28.0 mm	93
20.0 mm	92
14.0 mm	89
10.0 mm	87
6.30 mm	84
5.00 mm	82
3.35 mm	80
2.00 mm	76
1.18 mm	71
630 µm	65
425 µm	58
300 µm	54
200 µm	49
150 µm	46
63 µm	45
20 µm	31
6 µm	26
2 µm	17

Non Engineering Description

Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse

Sample Proportions - %

Cobbles	0.0
Gravel	24.2
Sand	31.3
Silt	27.4
Clay	17.0

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	50
D60	0.47
D10	

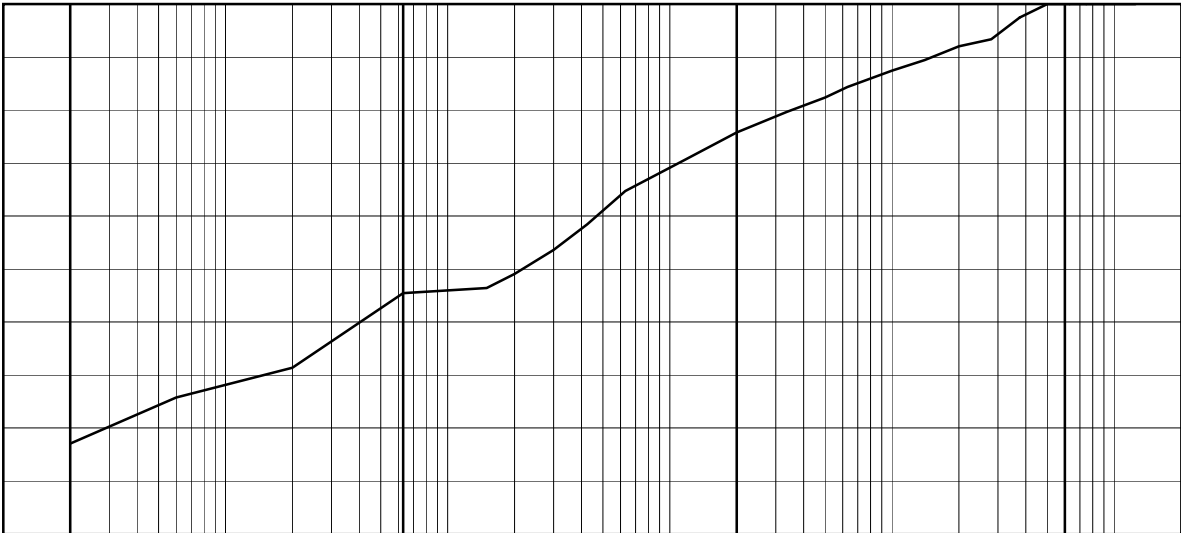
Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)N/A

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator

Checked & Approved

RF


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18/01/2024


PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP23	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 0.90 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	99
6.30 mm	97
5.00 mm	96
3.35 mm	94
2.00 mm	90
1.18 mm	84
630 µm	74
425 µm	61
300 µm	46
200 µm	33
150 µm	24
63 µm	17
20 µm	10
6 µm	6
2 µm	3

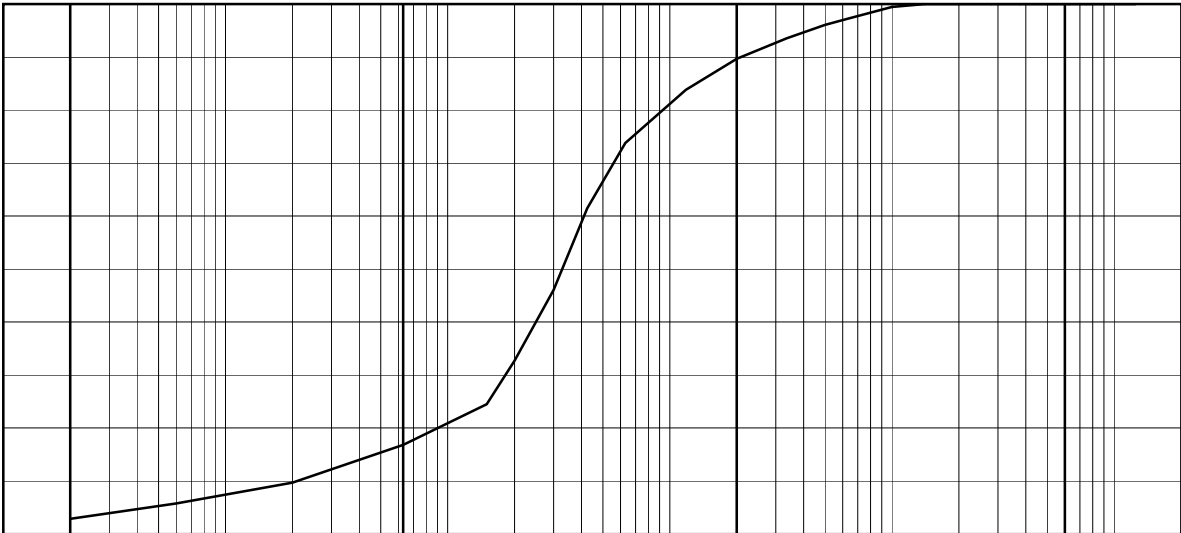
Non Engineering Description	
Brown gravelly silty SAND. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	10.4
Sand	73.3
Silt	13.5
Clay	2.8
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	14
D60	0.41
D10	0.021
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 19.5	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 18/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP23	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.25 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	95
37.5 mm	93
28.0 mm	90
20.0 mm	89
14.0 mm	87
10.0 mm	83
6.30 mm	78
5.00 mm	75
3.35 mm	73
2.00 mm	70
1.18 mm	65
630 µm	58
425 µm	49
300 µm	41
200 µm	34
150 µm	28
63 µm	24
20 µm	10
6 µm	7
2 µm	4

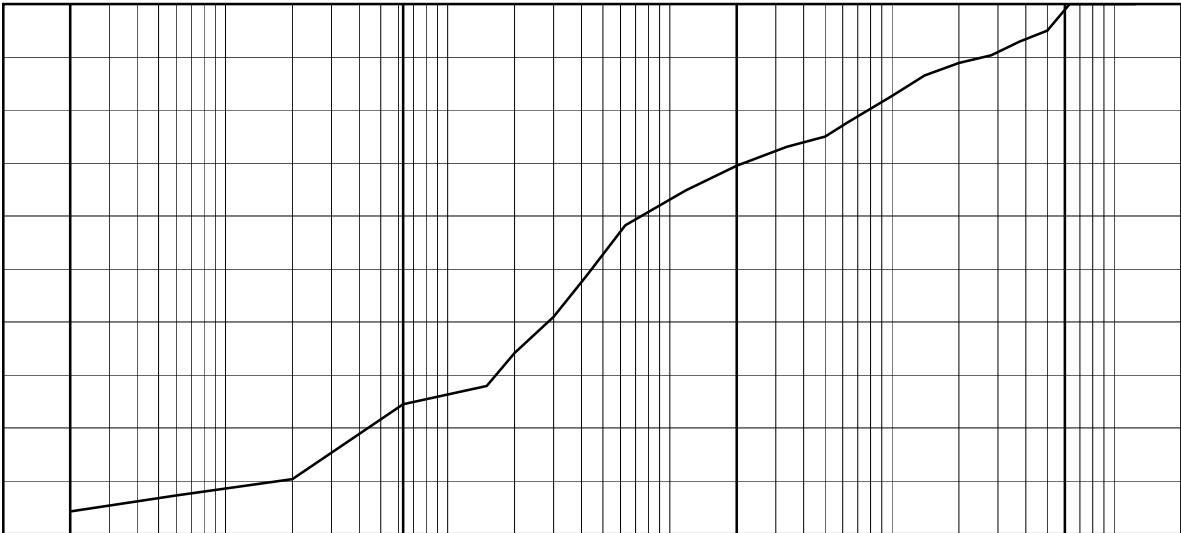
Non Engineering Description	
Brown silty very gravelly SAND. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	30.5
Sand	46.0
Silt	19.2
Clay	4.3
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	0.75
D10	0.018
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 41.7	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 18/01/2024		

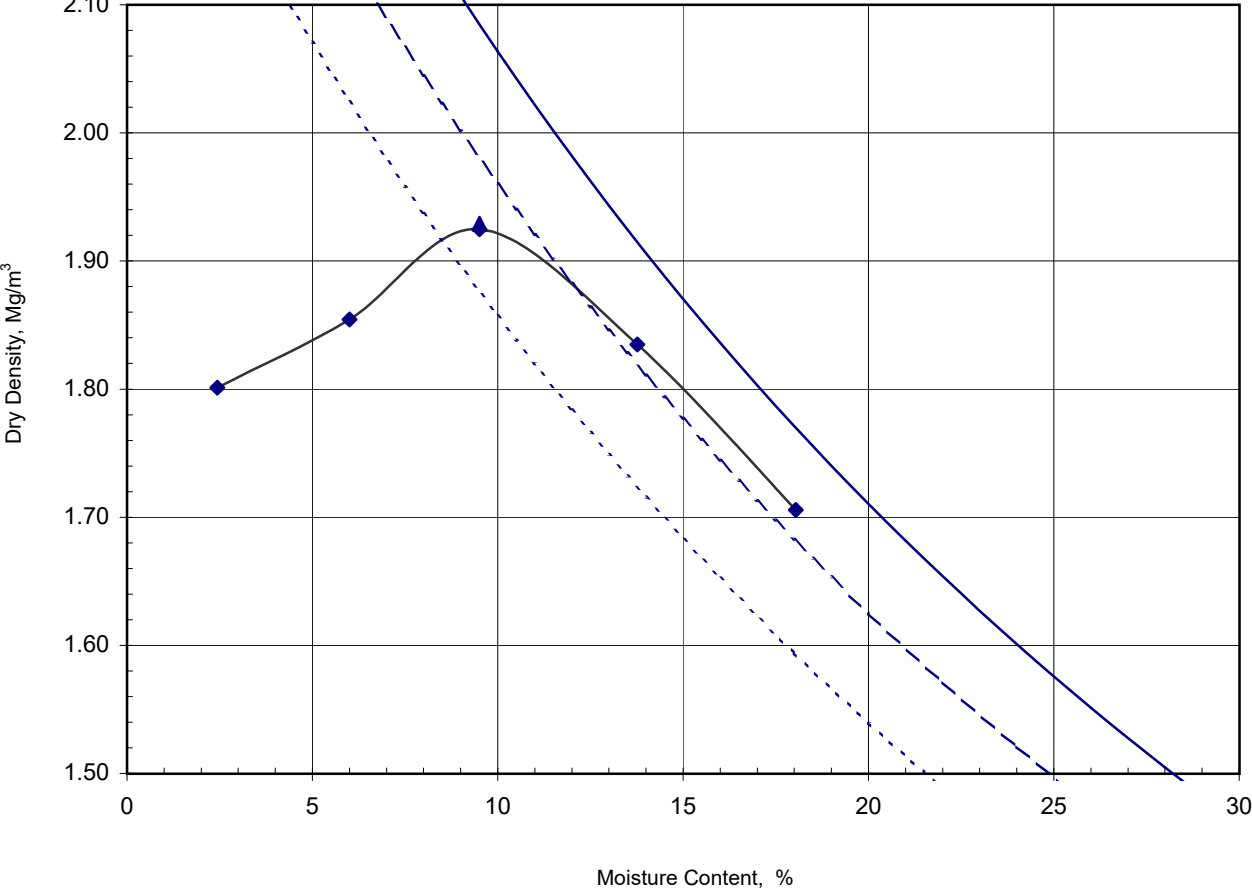
Sheet 1 of 1

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole	TP08
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	1.00
			Sample Type	B

— 0 % Air Voids


- - - 5 % Air Voids

... 10 % Air Voids




Moisture Content, %	Dry Density, Mg/m³
2.5	1.80
6.0	1.85
9.5	1.93
13.5	1.83
18.0	1.71

Non Engineering Description	Brown silty very gravelly SAND. Gravel is fine to coarse	
Preparation	Oven dried	
Test Method	4.5kg Rammer for soils with particles up to medium-gravel size	
Samples Used	Single	
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	3
Particle Density - Assumed	Mg/m³	2.60
Natural Moisture Content	%	0.0
Maximum Dry Density	Mg/m³	1.93
Optimum Moisture Content	%	9.5

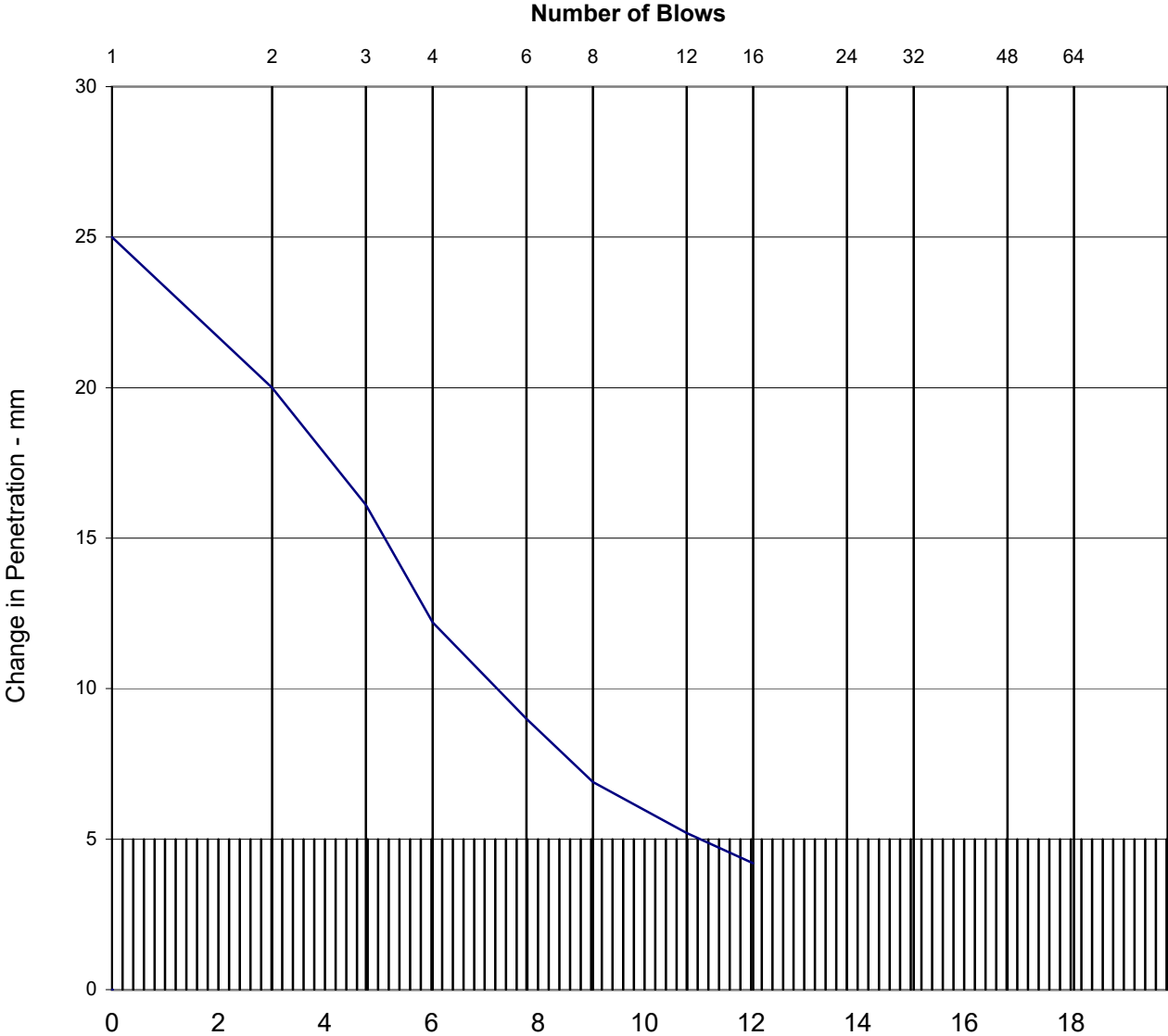
Originator	Checked & Approved	Moisture Content / Dry Density Relationship BS1377:Part 4:1990 Clause 3.5	
SM	CD 18/01/2024		

Sheet 1 of 1

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	TP08
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	1.00
			Sample Type	B


Number of Blows

Change in Penetration - mm



Moisture Condition Value

Non Engineering Description	Brown silty very gravelly SAND. Gravel is fine to coarse	
Determination No	1	
Moisture Condition Value	8.3	
Moisture Content	%	19
Method of determining MCV	Steepest fit line	
Mass retained on 20mm sieve	%	3.0
Notes		

Originator	Checked & Approved	MOISTURE CONDITION VALUE BS1377:Part 4:1990 Clause 5.4	
SM	CD 18/01/2024		

Sheet 1 of 1



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Hole ID TP01

Sample No

Depth (m) 0.60

Sample Type B

**Non Engineering
Description:**

Brown silty sandy fine to coarse GRAVEL with cobbles

Preparation Details:

Specimen was prepared at Natural Moisture Content

Compaction using 4.5kg compactive effort

Specimen Bulk Density 2.03 Mg/m³Specimen Dry Density 1.69 Mg/m³

Mass of sample > 20 mm 41.3 %

Specimen Unsoaked

Test Details:**Top**

Surcharge: 2.0 kg

Seating Load: 10 N

Moisture Content: 20 %

Base

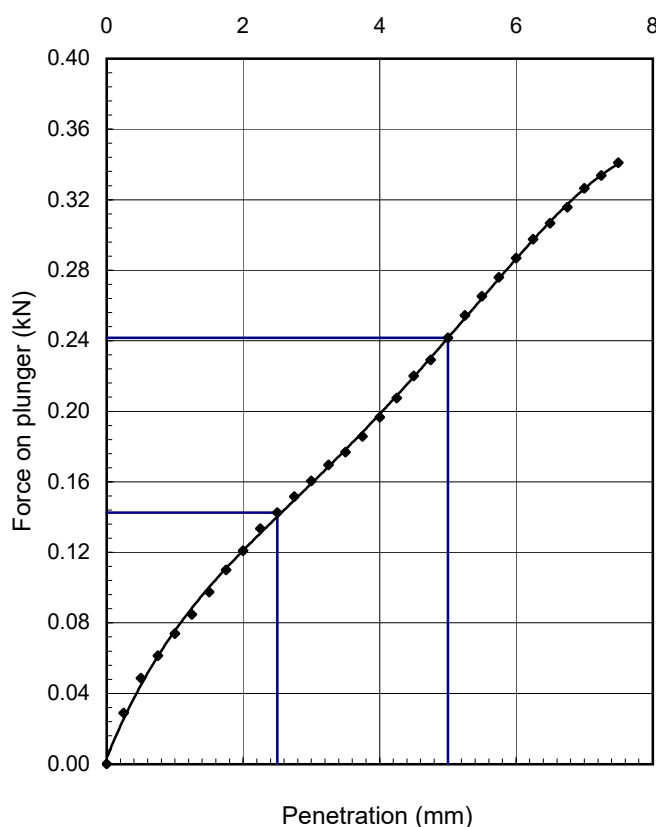
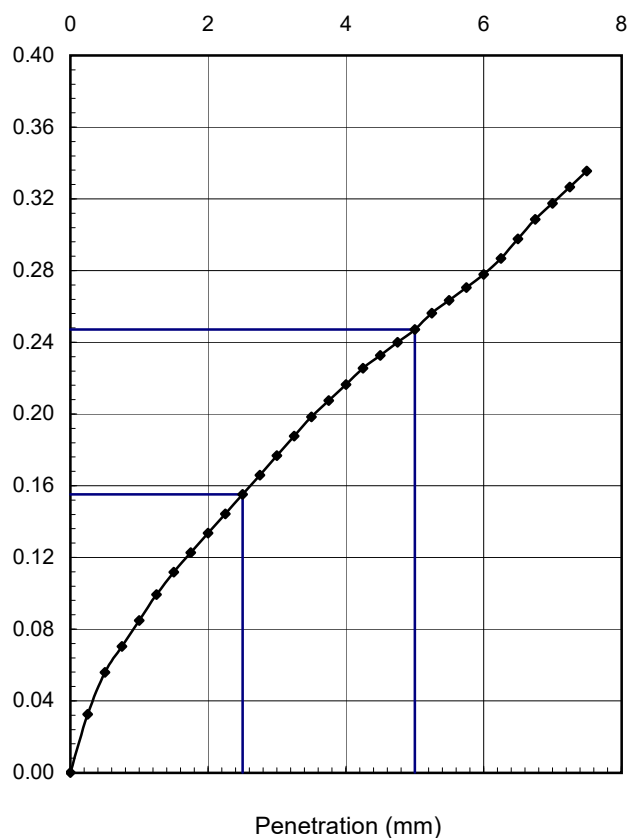
2.0 kg

10 N

20 %

CBR Value: 1.2 %

1.2 %

Top of Specimen
Penetration (mm)Base of Specimen
Penetration (mm)

Non-standard test due to % retained on 20mm sieve

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BS1377 : Part 4 : Clause 7 : 1990





Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Hole ID TP03

Sample No

Depth (m) 0.60

Sample Type B

Non Engineering Description: Brown silty very sandy fine to coarse GRAVEL

Preparation Details:

Specimen was prepared at Natural Moisture Content

Compaction using 4.5kg compactive effort

Specimen Bulk Density 1.95 Mg/m³Specimen Dry Density 1.59 Mg/m³

Mass of sample > 20 mm 17.7 %

Specimen Unsoaked

Test Details:**Top**

Surcharge: 2.0 kg

Seating Load: 10 N

Moisture Content: 23 %

Base

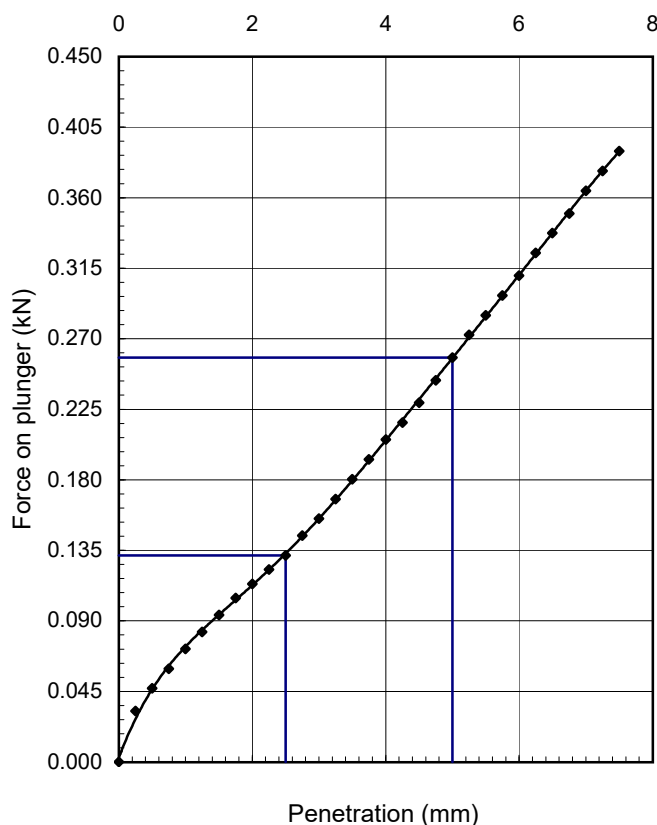
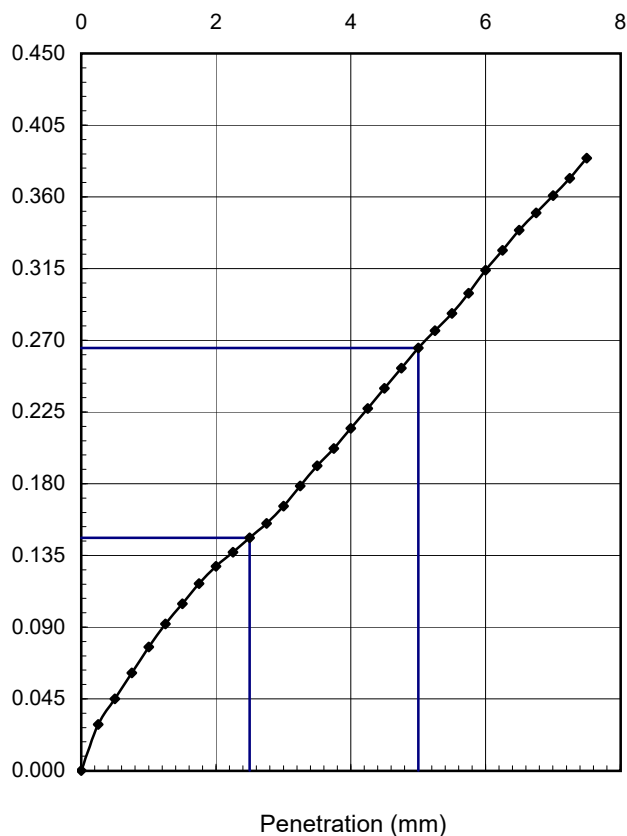
Surcharge: 2.0 kg

Seating Load: 10 N

Moisture Content: 23 %

CBR Value: 1.3 %

CBR Value: 1.3 %

Top of Specimen
Penetration (mm)Base of Specimen
Penetration (mm)

Originator

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18/01/2024**CALIFORNIA BEARING RATIO**

BS1377 : Part 4 : Clause 7 : 1990





Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Hole ID TP21

Sample No

Depth (m) 1.50

Sample Type B

Non Engineering Description:

Brown slightly gravelly slightly sandy CLAY with cobbles. Gravel is fine to coarse

Preparation Details:

Specimen was prepared at Natural Moisture Content

Compaction using 2.5kg compactive effort

Specimen Bulk Density 2.16 Mg/m³Specimen Dry Density 1.85 Mg/m³

Mass of sample > 20 mm 20.8 %

Specimen Unsoaked

Test Details:**Top**

Surcharge: 2.0 kg

Seating Load: 10 N

Moisture Content: 17 %

Base

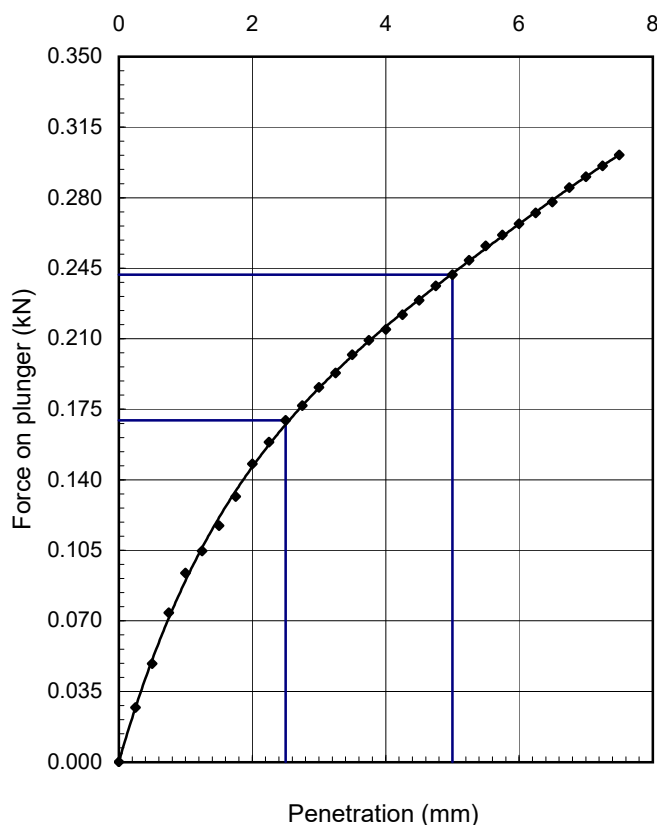
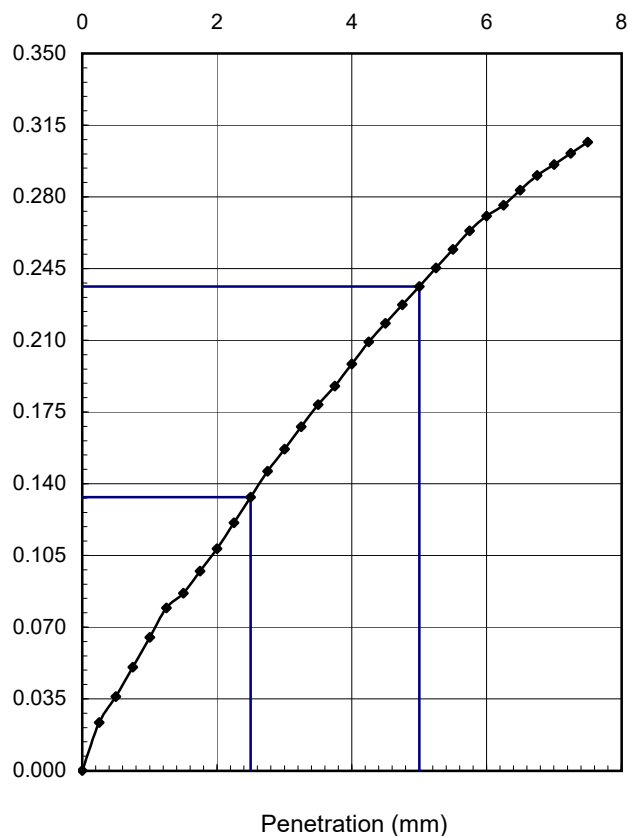
2.0 kg

10 N

17 %

CBR Value: 1.3 %

1.2 %

Top of Specimen
Penetration (mm)Base of Specimen
Penetration (mm)

Originator

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BS1377 : Part 4 : Clause 7 : 1990



	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	TP22
	Engineer	SSE Perth Inveralmond HSE	Sample No	
			Depth (m)	1.00
			Sample Type	B

Non Engineering Description: Brown very clayey SAND and GRAVEL. Gravel is fine to coarse

Preparation Details:

Specimen was prepared at Natural Moisture Content

Compaction using 2.5kg compactive effort

Specimen Bulk Density 2.15 Mg/m³

Specimen Dry Density 1.84 Mg/m³

Mass of sample > 20 mm 12.2 %

Specimen Unsoaked

Test Details:

Surcharge: 2.0 kg

Seating Load: 10 N

Moisture Content: 17 %

Base

2.0 kg

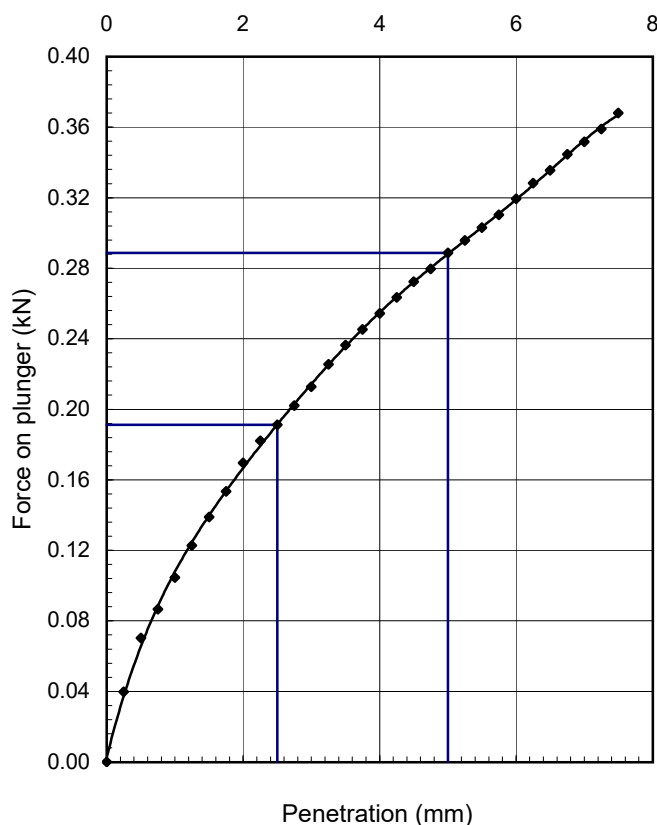
10 N

17 %

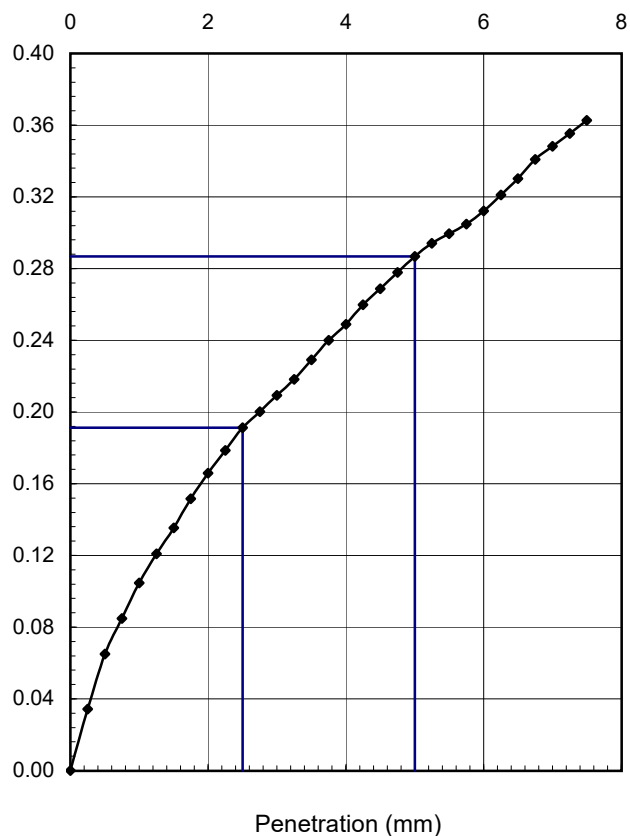
CBR Value: 1.4 %


1.4 %

Top of Specimen
Penetration (mm)



Base of Specimen
Penetration (mm)



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NW	CD 18/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Hole ID TP23

Sample No

Depth (m) 1.25

Sample Type B

**Non Engineering
Description:**

Brown silty very gravelly SAND. Gravel is fine to coarse

Preparation Details:

Specimen was prepared at Natural Moisture Content

Compaction using 4.5kg compactive effort

Specimen Bulk Density 2.08 Mg/m³Specimen Dry Density 1.76 Mg/m³

Mass of sample > 20 mm 13.7 %

Specimen Unsoaked

Test Details:**Top**

Surcharge: 2.0 kg

Seating Load: 50 N

Moisture Content: 18 %

Base

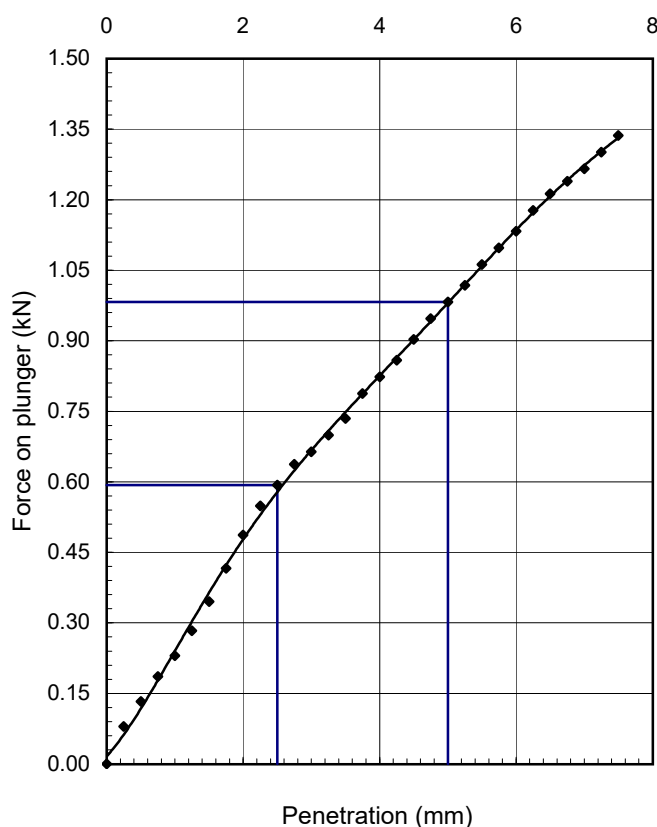
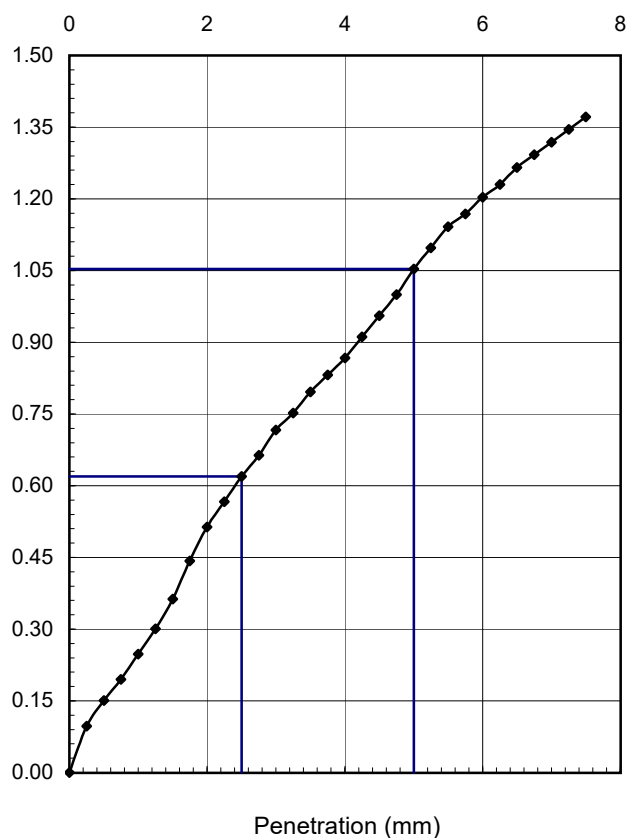
2.0 kg

50 N

18 %

CBR Value: 4.9 %

5.3 %

Top of Specimen
Penetration (mm)Base of Specimen
Penetration (mm)

Originator


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18/01/2024**CALIFORNIA BEARING RATIO**

BS1377 : Part 4 : Clause 7 : 1990



	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP01	
	Engineer SSE Perth Inveralmond HSE		Sample Ref	
		Depth (m)	0.60	
		Sample Type	B	

Specimen Details

Depth within original sample

n/a

Orientation within original sample

n/a

Test condition

Submerged

Non Engineering Description

Brown silty sandy fine to coarse GRAVEL with cobbles

Preparation

Material > 2mm removed (69% passing). Remoulded using 2.5kg compactive effort at as-received moisture content

Specimen Number

123

Length

mm60.060.160.0

Width

mm60.060.060.0

Height

mm25.025.025.0

Initial moisture content

%151515

Initial wet density

Mg/m³1.991.991.99

Initial dry density

Mg/m³1.731.731.73

Particle Density (assumed)

Mg/m³2.652.652.65

Consolidation Stage

Normal stress

kPa2550100

Height change

mm-2.6-3.2-4.3

Duration

day(s)111

Shearing Stage

Normal stress

kPa2550100

Peak Conditions:

Rate of horizontal displacement

mm/min0.060.060.06

Maximum shear stress

kPa294372

Horizontal displacement

mm3.64.75.1

Height change

mm1.10.91.2

Final Conditions

Final moisture content

%232322

Duration

day(s)111

Shear Strength Parameters


Maximum Condition: (linear tangent interpretation)

Effective Cohesion

kPa12

Effective Angle of Shearing Resistance

degrees32.5

Originator	Checked & Approved	Shear Strength by Direct Shear (small shearbox)	
SG	CD 18/01/2024		

BS1377:Part 7:1990 Clause 4

Sheet 1 of 5



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

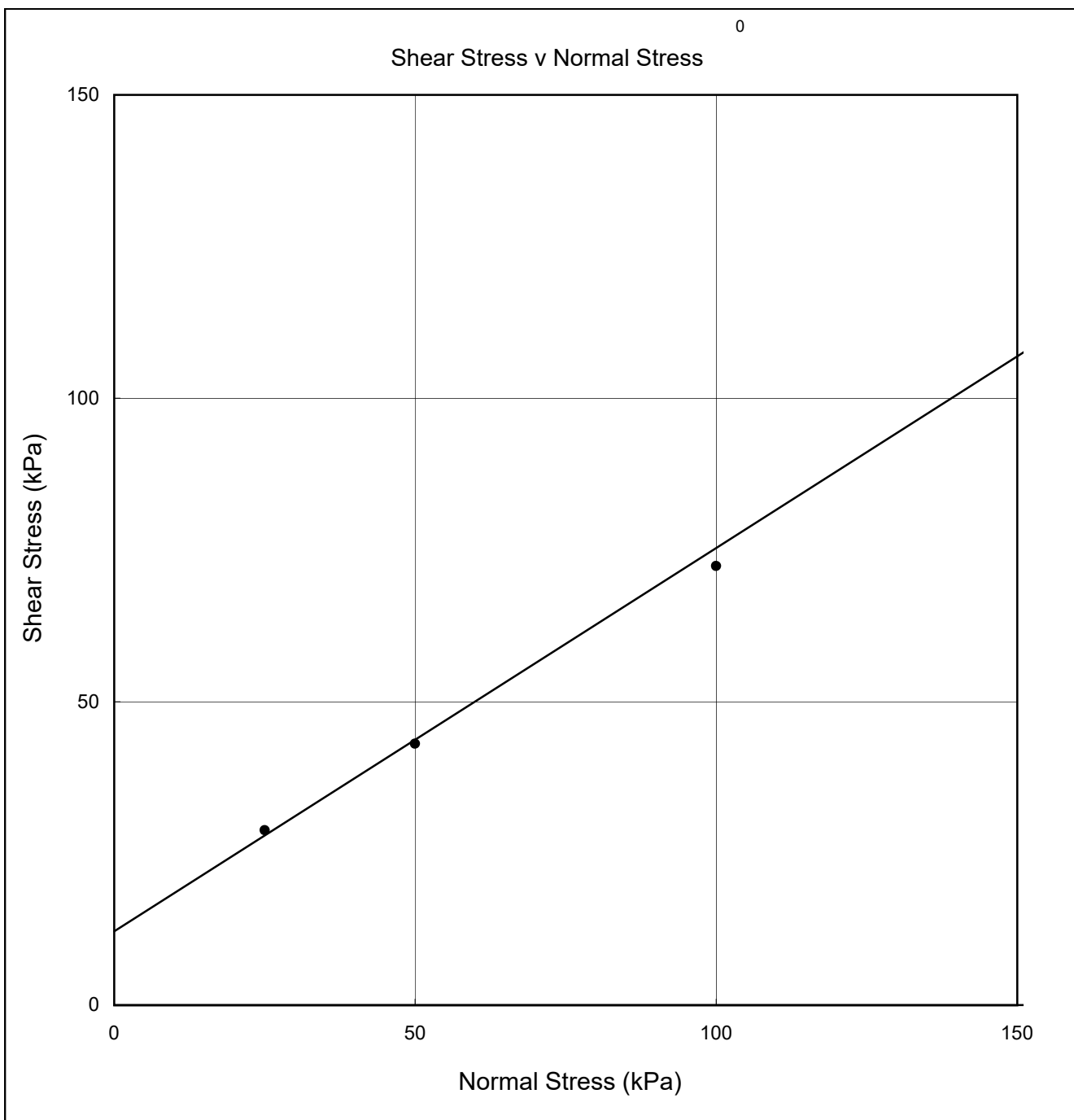
Contract No 26555

Hole TP01

Sample Ref

Depth (m) 0.60

Sample Type B



Shear Strength Parameters

$c' = 12 \text{ kPa}$

$\phi' = 32.5^\circ$

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Shear Strength by Direct Shear (small shearbox)

BS1377:Part 7:1990 Clause 4



Sheet 2 of 5



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Hole TP01

Sample Ref

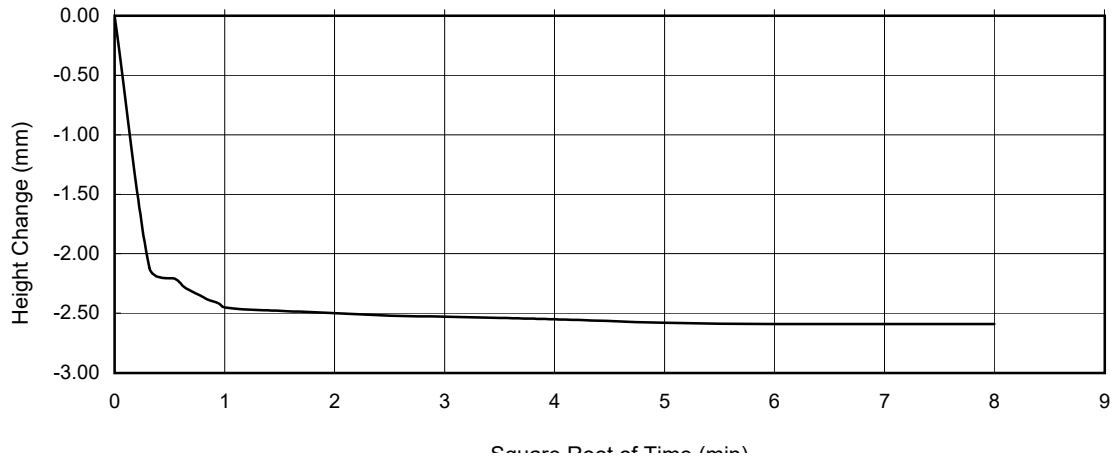
Depth (m) 0.60

Sample Type B

Specimen No. 1

Normal Pressure = 25 kPa

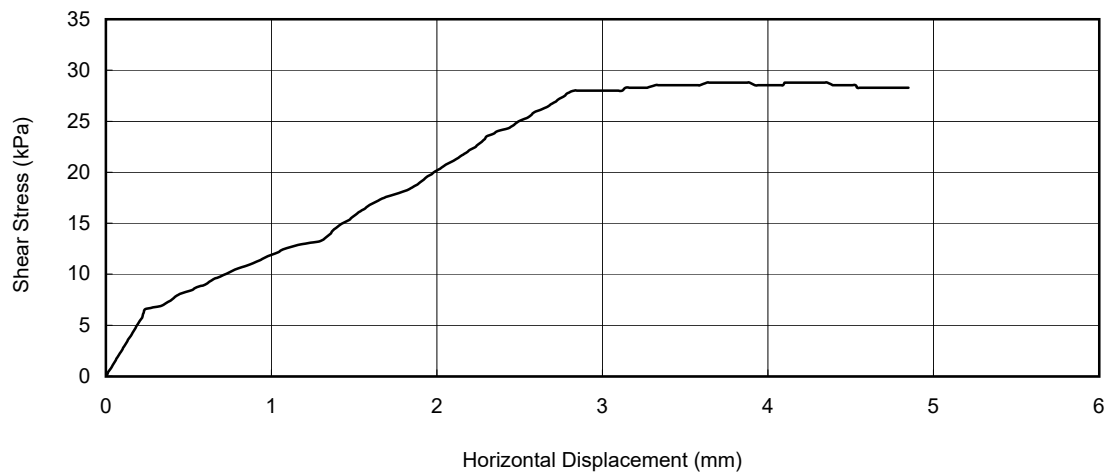
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



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Shear Strength by Direct Shear (small shearbox)

BS1377:Part 7:1990 Clause 4



Sheet 3 of 5



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Hole TP01

Sample Ref

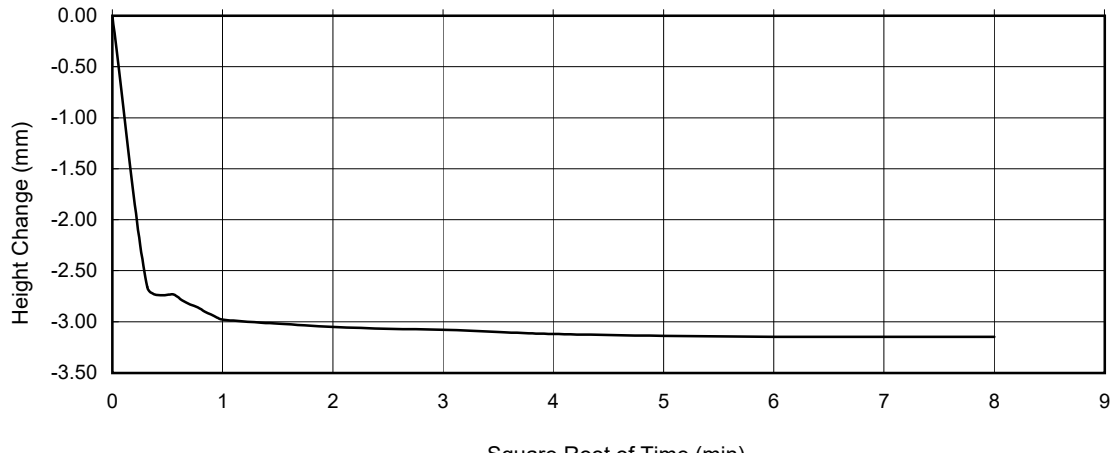
Depth (m) 0.60

Sample Type B

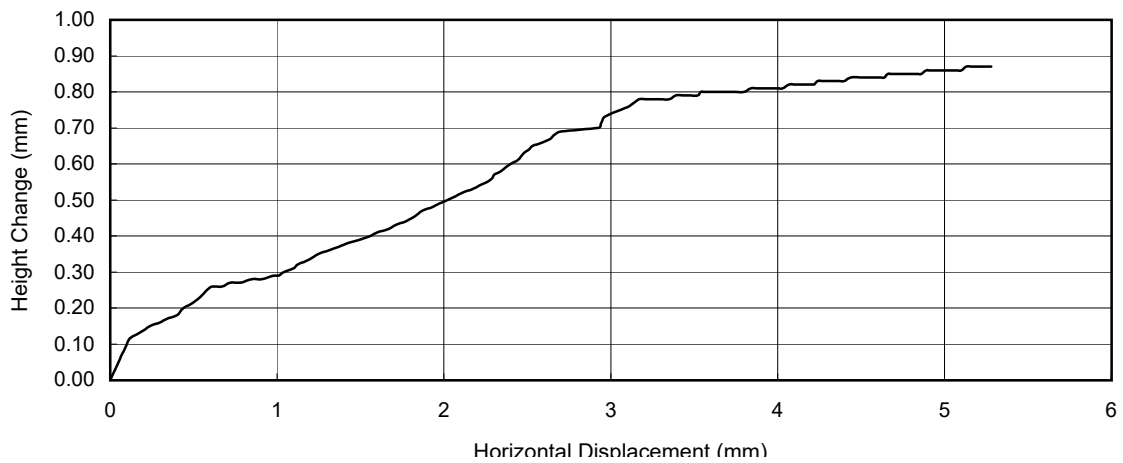
Specimen No. 2

Normal Pressure = 50 kPa

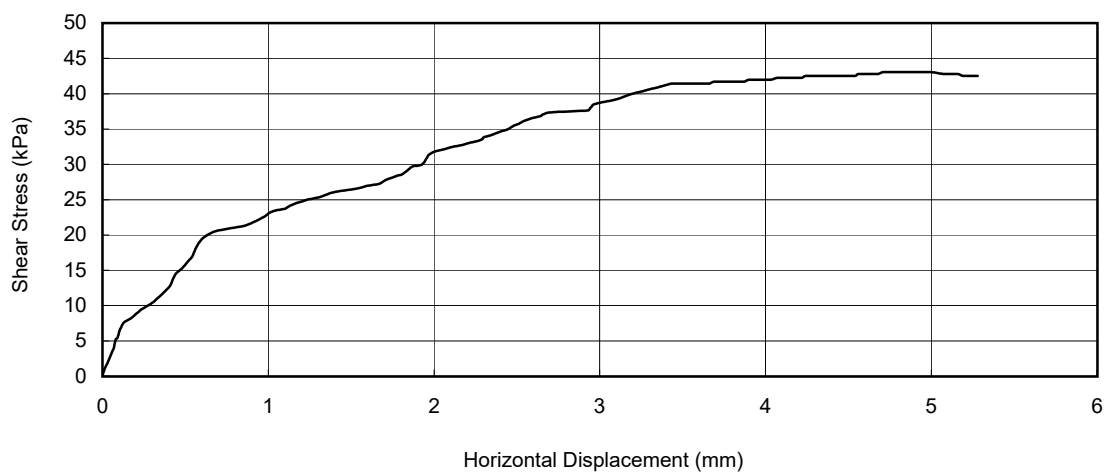
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



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Shear Strength by Direct Shear (small shearbox)

BS1377:Part 7:1990 Clause 4



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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Hole TP01

Sample Ref

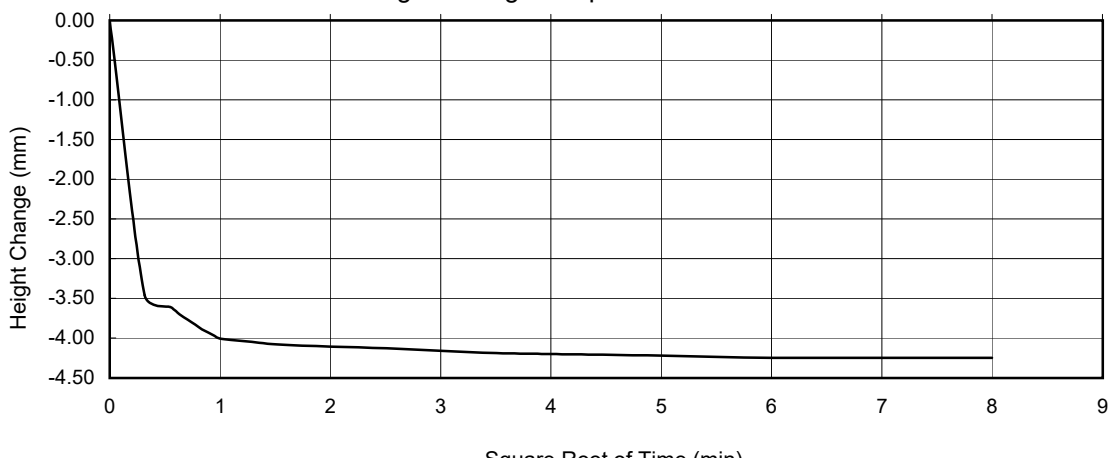
Depth (m) 0.60

Sample Type B

Specimen No. 3

Normal Pressure = 100 kPa

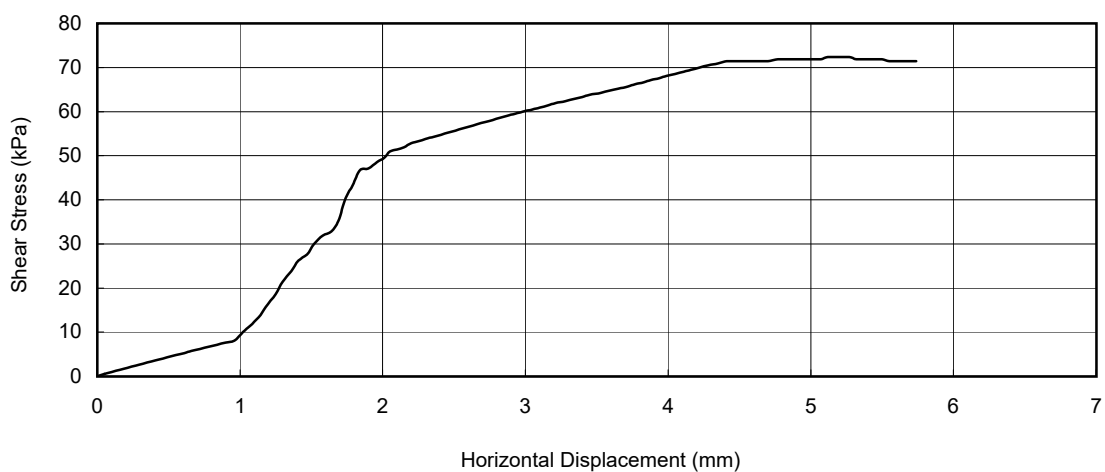
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



Originator

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Shear Strength by Direct Shear (small shearbox)

BS1377:Part 7:1990 Clause 4



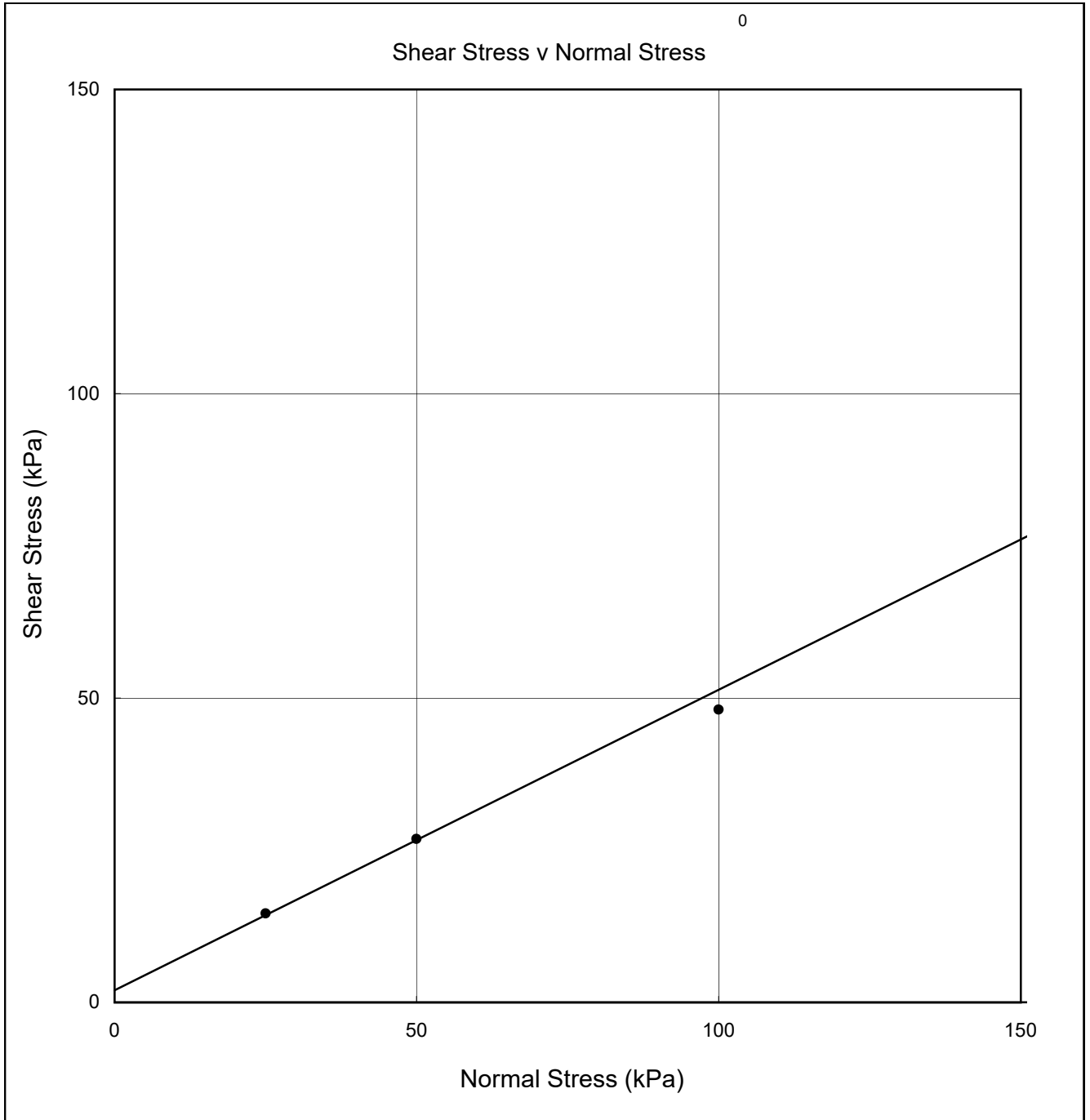
Sheet 5 of 5

	Site	LT520 BRACO WEST SUBSTATION			Contract No	26555		
	Client	SHE Transmission plc			Hole	TP03		
	Engineer	SSE Perth Inveralmond HSE			Sample Ref			
					Depth (m)	0.60		
					Sample Type	B		
Specimen Details								
Depth within original sample					n/a			
Orientation within original sample					n/a			
Test condition					Submerged			
Non Engineering Description					Brown silty very sandy fine to coarse GRAVEL			
Preparation					Material>2mm removed (52% passing). Remoulded using 2.5kg compactive effort at as-received moisture content			
Specimen Number								
					1	2	3	
Length					mm	60.0	60.0	60.0
Width					mm	60.0	59.9	60.0
Height					mm	25.0	25.0	25.0
Initial moisture content					%	17	17	17
Initial wet density					Mg/m ³	2.02	2.02	2.02
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	25	50	100
Height change					mm	-1.9	-2.5	-4.3
Duration					day(s)	1	1	1
Shearing Stage								
Normal stress					kPa	25	50	100
Peak Conditions:								
Rate of horizontal displacement					mm/min	0.06	0.06	0.06
Maximum shear stress					kPa	15	27	48
Horizontal displacement					mm	3.8	4.5	4.9
Height change					mm	0.7	1.3	2.2
Final Conditions								
Final moisture content					%	20	21	21
Duration					day(s)	1	1	1
Shear Strength Parameters								
Maximum Condition: (linear tangent interpretation)								
Effective Cohesion					kPa	2		
Effective Angle of Shearing Resistance					degrees	26.5		
Shear Strength by Direct Shear (small shearbox)								
Originator	Checked & Approved	BS1377:Part 7:1990 Clause 4						
SG	CD 18/01/2024							
Sheet 1 of 5								



Site LT520 BRACO WEST SUBSTATION
Client SHE Transmission plc
Engineer SSE Perth Inveralmond HSE

Contract No 26555
Hole TP03
Sample Ref
Depth (m) 0.60
Sample Type B



Shear Strength Parameters

$c' = 2$ kPa
 $\phi' = 26.5^\circ$

Originator	Checked & Approved	Shear Strength by Direct Shear (small shearbox)	
SG	CD 18/01/2024		
		BS1377:Part 7:1990 Clause 4	Sheet 2 of 5



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Hole TP03

Sample Ref

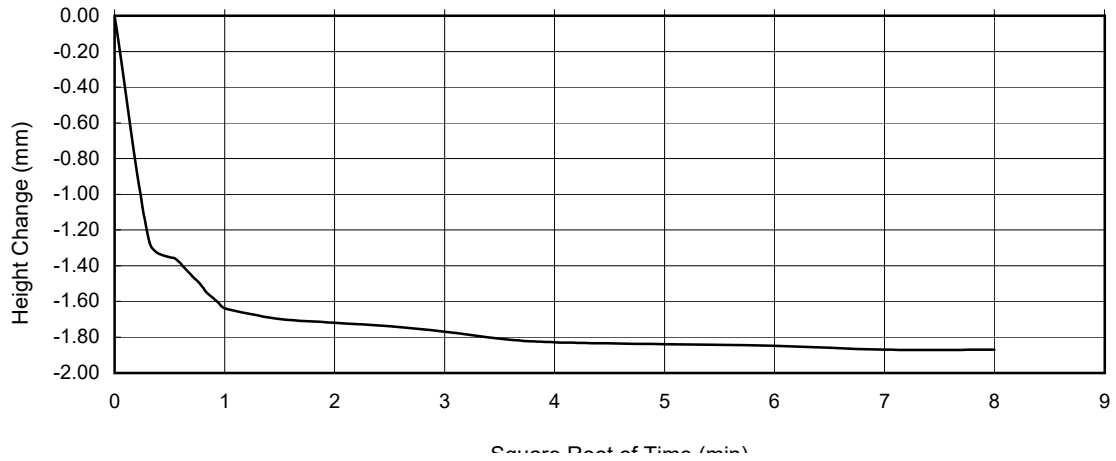
Depth (m) 0.60

Sample Type B

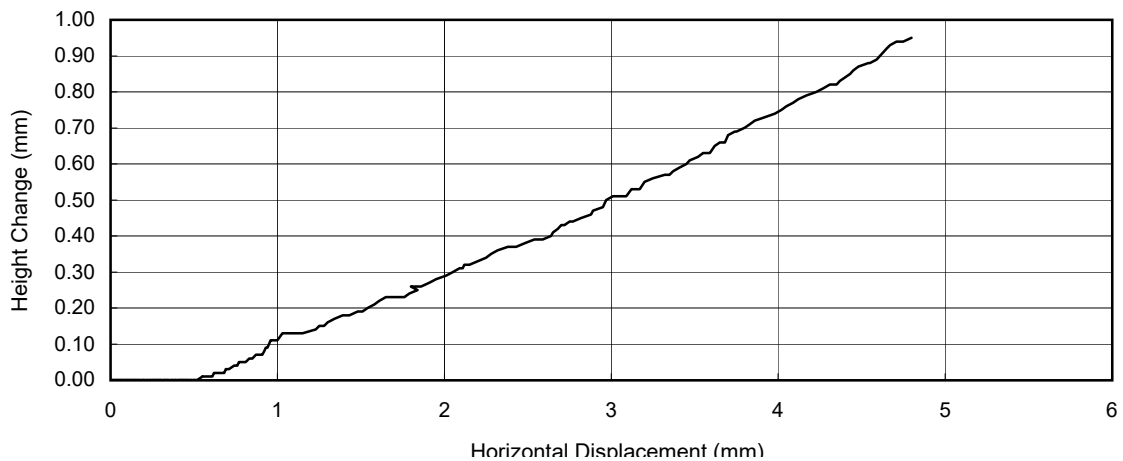
Specimen No. 1

Normal Pressure = 25 kPa

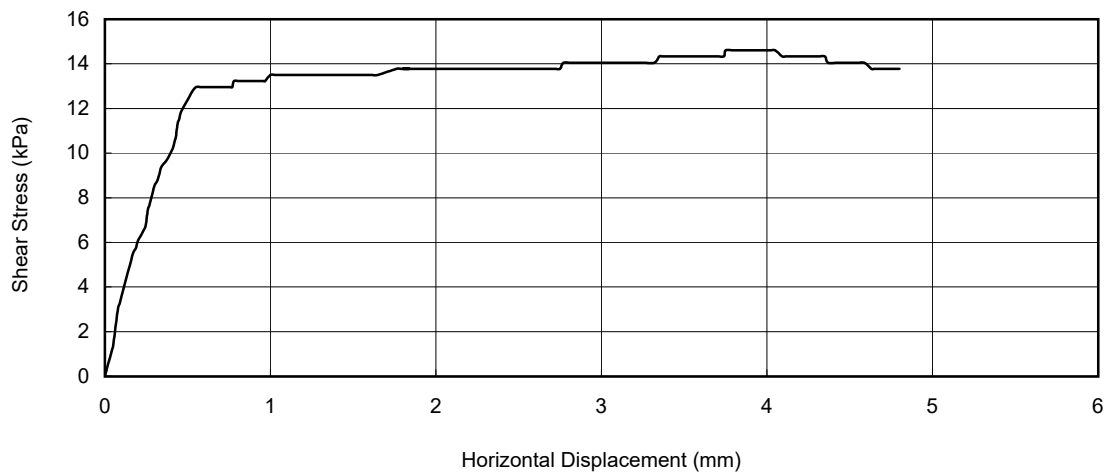
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



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Shear Strength by Direct Shear (small shearbox)

BS1377:Part 7:1990 Clause 4



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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Hole TP03

Sample Ref

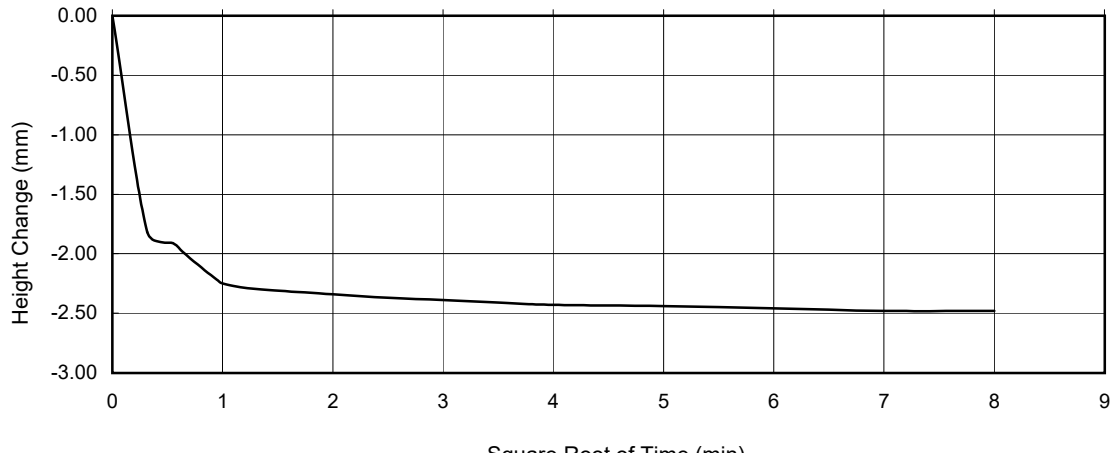
Depth (m) 0.60

Sample Type B

Specimen No. 2

Normal Pressure = 50 kPa

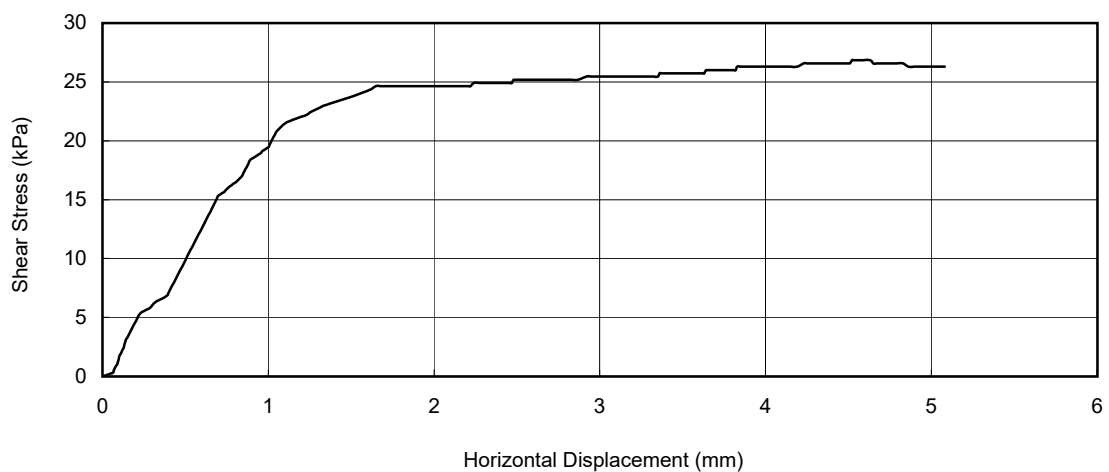
Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



Originator

Checked &
Approved

SG

CD
18/01/2024

Shear Strength by Direct Shear (small shearbox)

BS1377:Part 7:1990 Clause 4





Site LT520 BRACO WEST SUBSTATION
Client SHE Transmission plc
Engineer SSE Perth Inveralmond HSE

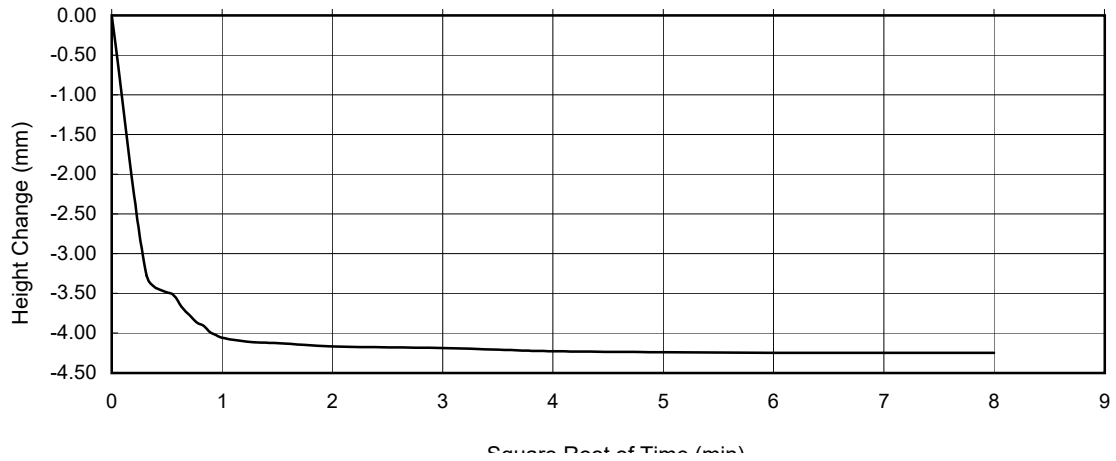
Contract No 26555

Hole TP03
Sample Ref
Depth (m) 0.60
Sample Type B

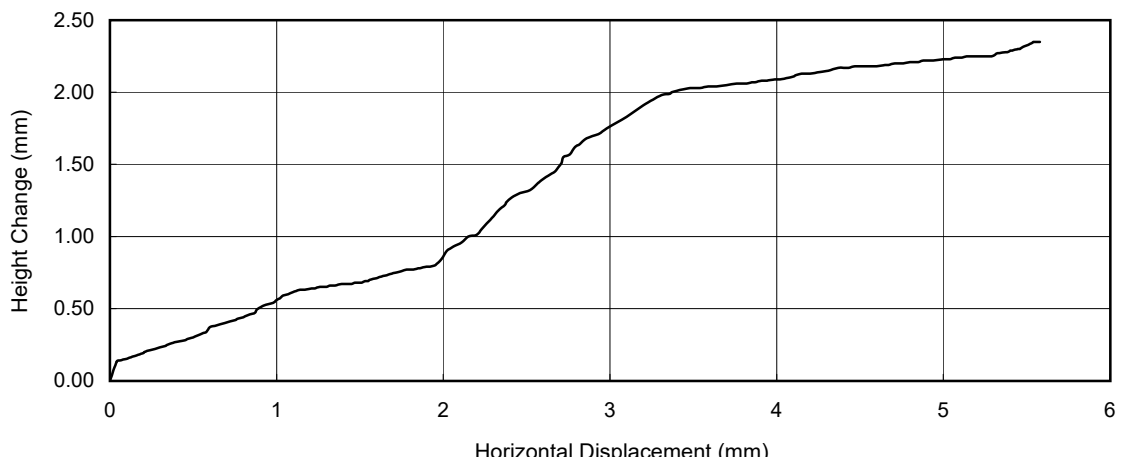
Specimen No. 3

Normal Pressure = 100 kPa

Height Change v Square Root Time



Height Change v Horizontal Displacement



Shear Stress v Horizontal Displacement



Originator

Checked &
Approved



SG

CD
18/01/2024

Shear Strength by Direct Shear (small shearbox)

BS1377:Part 7:1990 Clause 4



				Site LT520 BRACO WEST SUBSTATION				Contract No 26555	
				Client SHE Transmission plc					
				Engineer SSE Perth Inveralmond HSE					
Sample Identification				Lab Sample ID	10-14mm Size Fraction Passing 11.2mm Sieve	Particle Density (8-12.5 mm) Mg/m³	Los Angeles Coefficient LA	Impact Value SZ	Test Date
Hole ID	Depth m	Sample Ref	Sample Type						
TP06	1.00		B						
				2012717	35	~	27	~	~
UKAS accredited test							Yes	No	
Notes Opinions and interpretations are outside the scope of UKAS accreditation.									
Originator		Approved		RESISTANCE TO FRAGMENTATION BY LOS ANGELES AND IMPACT TEST METHODS BS EN 1097-2:2020					
DW		CD 18/01/2024							
Sheet 1 of 1									

Summary of Chemical Analysis

Soil Samples

Our Ref 23-30018

Client Ref A15044-1

Contract Title A15044-1

Lab No	2280455	2280456	2280457	2280458
Sample ID	TP01	TP03	TP03	TP08
Depth	0.60	0.60	1.30	1.00
Other ID	2072711	2072713	2072715	2072719
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Inorganics							
pH	DETSC 2008#		pH	7.1	6.1	6.5	5.9
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l	200	49	160	32

Information in Support of the Analytical Results

Our Ref 23-30018

Client Ref A15044-1

Contract A15044-1

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2280455	TP01 0.60 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
2280456	TP03 0.60 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
2280457	TP03 1.30 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
2280458	TP08 1.00 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-2
Issue No 01

LABORATORY TEST REPORT



Project Name		LT520 BRACO WEST SUBSTATION	
Project Number		A15044-2	Date samples received 13/12/2023
Your Ref		26555	Date written instructions received 14/12/2023
Purchase Order		26555	Date testing commenced 19/12/2023
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	12	Determination of Water Content	Yes
	2	Atterberg Limit	Yes
	8	Particle Size Distribution	Yes
	2	Moisture Content / Dry Density Relationship	Yes
	4	Moisture Condition Value	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 18/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  18/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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Offices in Airdrie, Birmingham and Aston Clinton

Head Office : Whistleberry Road, Hamilton, Glasgow, Scotland, ML3 0HP

				Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
				Client SHE Transmission plc			
				Engineer SSE Perth Inveralmond HSE			
Sample Identification							
Exploratory Hole	Depth m	Sample Ref	Sample Type				
TP02	0.70		B	2013055	Brown silty SAND and GRAVEL. Gravel is fine to coarse	16.8	
TP02	0.70		D	2013053	Brown silty SAND and GRAVEL. Gravel is fine to coarse	7.2	
TP02	1.50		D	2013057	Brown silty SAND and GRAVEL. Gravel is fine to coarse	15.2	
TP10	2.20		B	2013058	Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse	8.0	
TP11	0.70		D	2013060	Brown very silty very gravelly SAND. Gravel is fine to coarse	18.2	
TP11	1.00		B	2013061	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse	9.7	
TP11	1.10		D	2013063	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse	15.3	
TP11	2.50		D	2013065	Brown very clayey SAND and GRAVEL. Gravel is fine to coarse	16.7	
TP19	1.10		B	2013068	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse	15.8	
TP19	1.10		D	2013067	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse	16.1	
TP20	1.40		B	2013071	Brown clayey SAND and GRAVEL with cobbles. Gravel is fine to coarse	13.1	
TP20	1.40		D	2013069	Brown clayey SAND and GRAVEL. Gravel is fine to coarse	17.3	
Notes							
Originator		Checked & Approved		<div>Determination of the Water Content</div> <div>BS EN ISO 17892-1:2014</div>			
TP		<div>CD</div> <div>18/01/2024</div>					
							Sheet 1 of 1



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No. 26555

Hole ID TP11

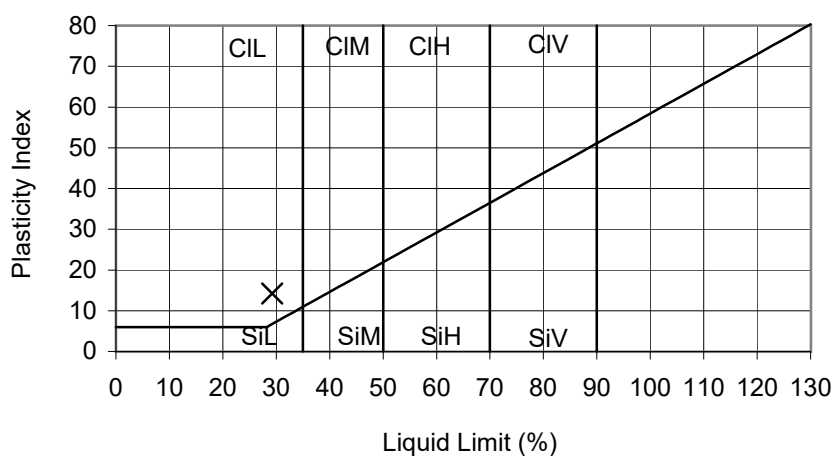
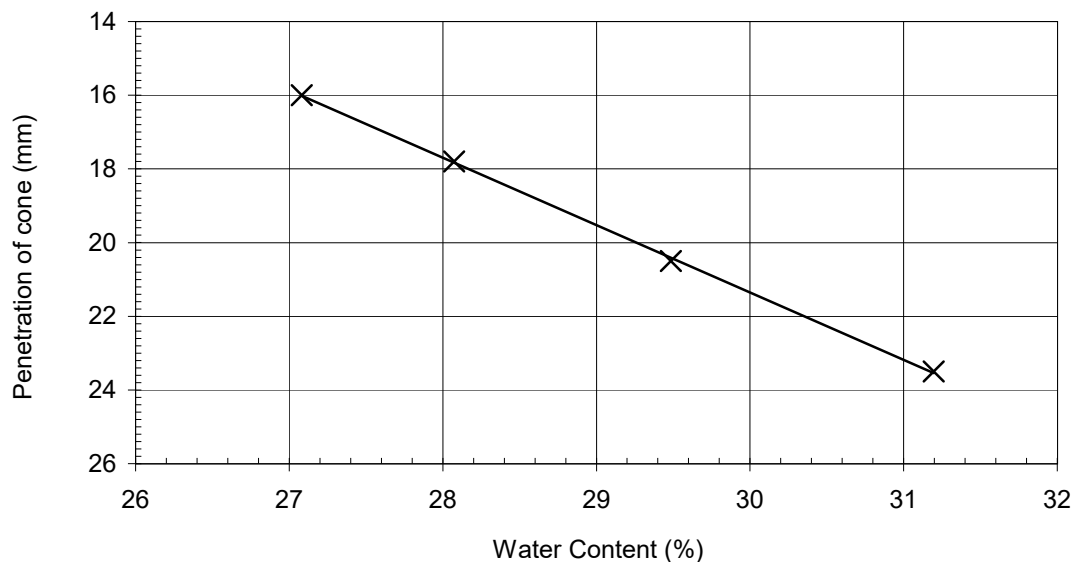
Sample Ref

Depth (m) 1.10

Sample Type D

Non Engineering Description : Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 15.3 %
 Percentage retained on 425µm sieve : 40 %
 Liquid Limit : 29 %
 Plastic Limit : 15 %
 Plasticity Index : 14

Equivalent water content of material passing 425µm sieve : 25.5 %

Liquidity Index : 0.75

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	 18/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No. 26555

Hole ID TP19

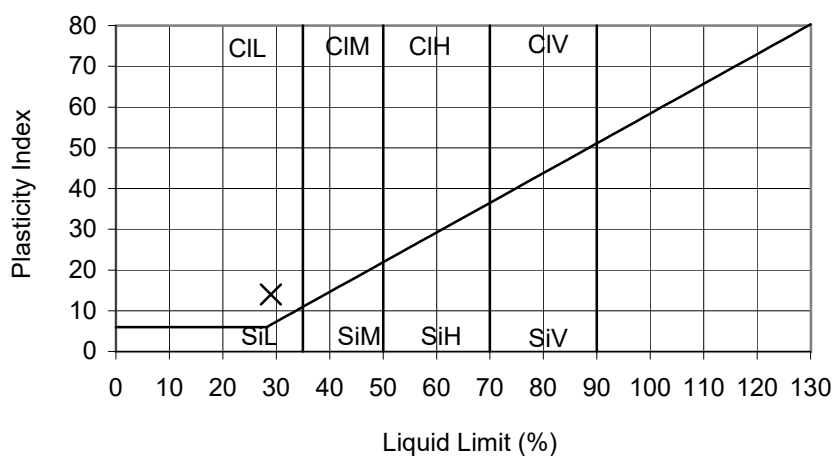
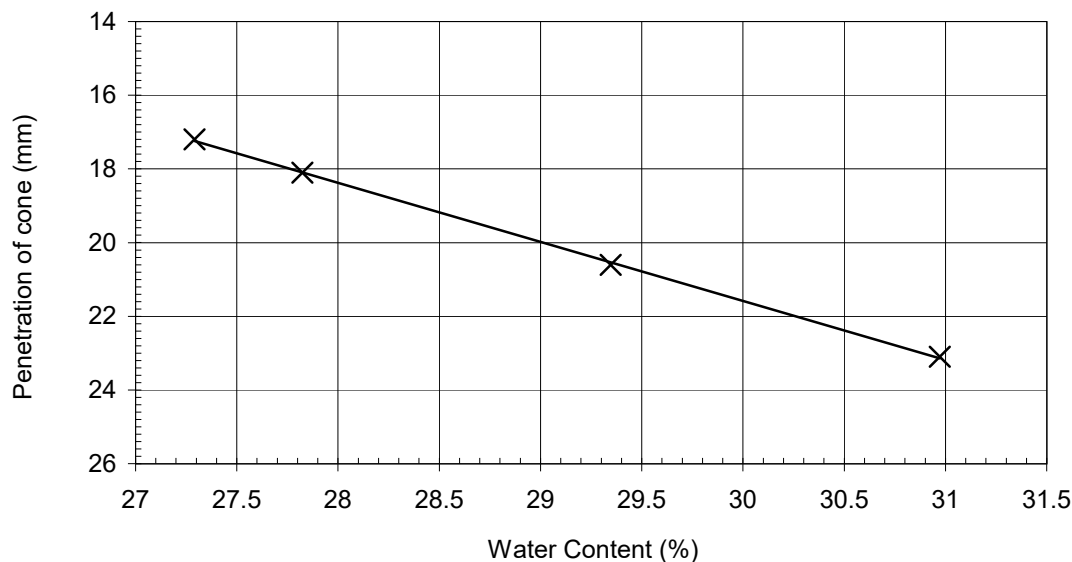
Sample Ref

Depth (m) 1.10

Sample Type D

Non Engineering Description : Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Liquid Limit was determined by mixing using increasing water content and 30° cone


Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 16.1 %
 Percentage retained on 425µm sieve : 49 %
 Liquid Limit : 29 %
 Plastic Limit : 15 %
 Plasticity Index : 14

Equivalent water content of material passing 425µm sieve : 31.6 %

Liquidity Index : 1.19

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	 18/01/2024		

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP02	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 0.70 Sample Type B	

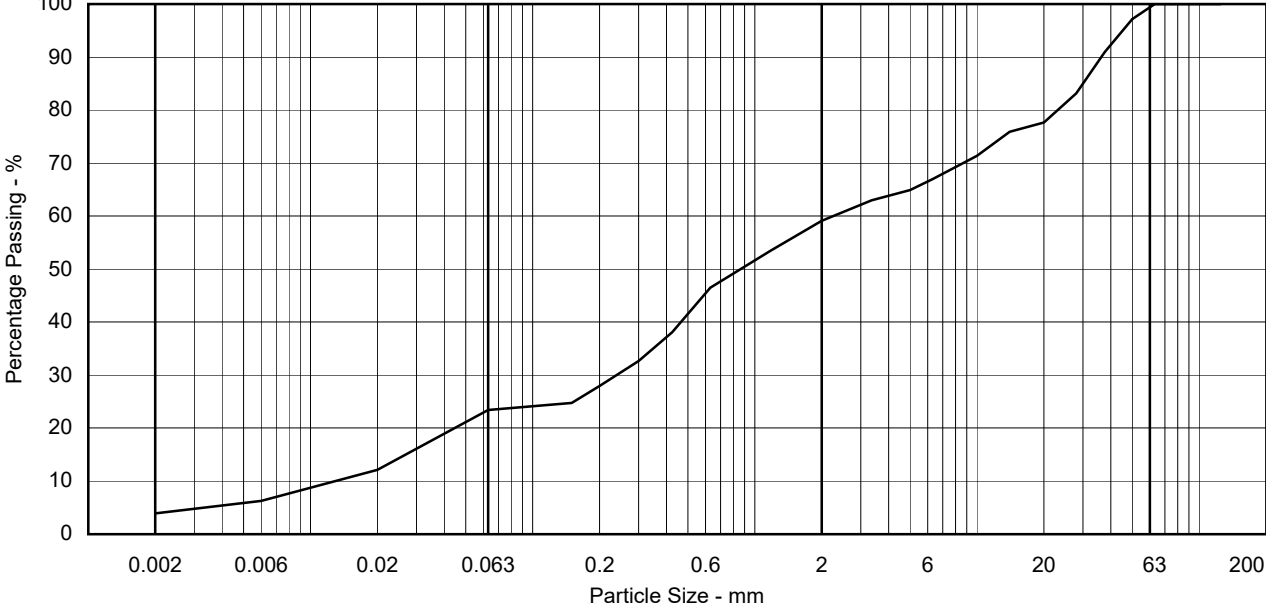
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	97
37.5 mm	91
28.0 mm	83
20.0 mm	78
14.0 mm	76
10.0 mm	71
6.30 mm	67
5.00 mm	65
3.35 mm	63
2.00 mm	59
1.18 mm	53
630 µm	46
425 µm	38
300 µm	33
200 µm	28
150 µm	25
63 µm	23
20 µm	12
6 µm	6
2 µm	4


Non Engineering Description	
Brown silty SAND and GRAVEL. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	40.9
Sand	36.5
Silt	18.8
Clay	3.9
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	2.3
D10	0.013
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 176.9	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 18/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP02	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.50 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	93
50.0 mm	88
37.5 mm	86
28.0 mm	84
20.0 mm	78
14.0 mm	76
10.0 mm	72
6.30 mm	67
5.00 mm	65
3.35 mm	63
2.00 mm	59
1.18 mm	54
630 µm	47
425 µm	38
300 µm	33
200 µm	28
150 µm	25
63 µm	24
20 µm	12
6 µm	6
2 µm	4

Non Engineering Description

Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse

Sample Proportions - %

Cobbles	6.7
Gravel	33.9
Sand	36.6
Silt	18.9
Clay	3.9

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	75
D60	2.2
D10	0.013

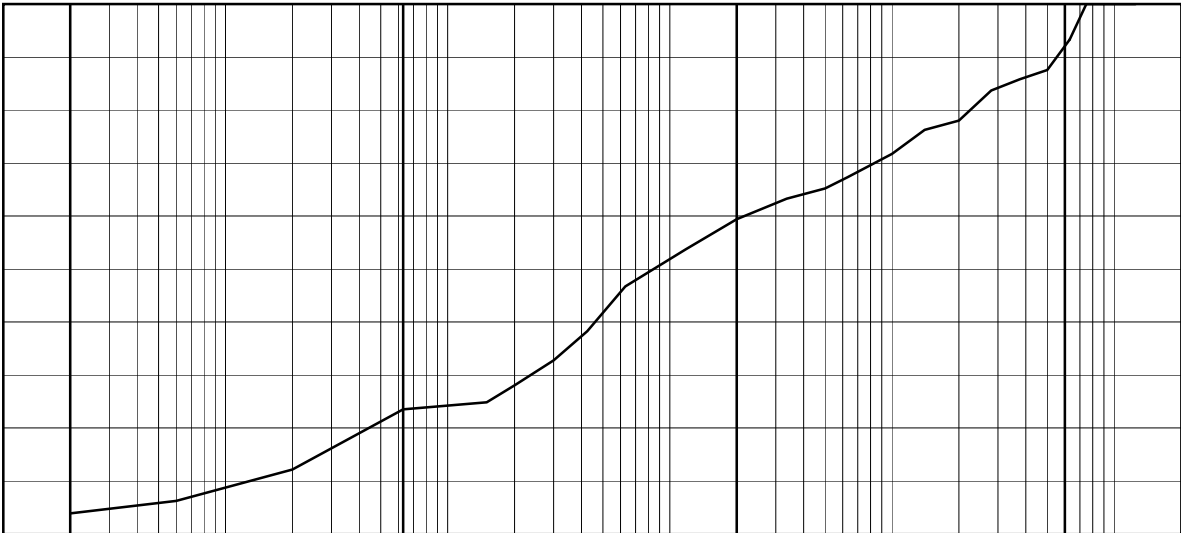
Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)169.2

Notes


Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	<div><div>PARTICLE SIZE DISTRIBUTION</div><div>BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method</div></div>	
RF	<div>CD</div> <div>18/01/2024</div>		

Sheet 1 of 1



SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP10

Sample Ref

Depth (m)2.20

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	79
75.0 mm	64
63.0 mm	60
50.0 mm	60
37.5 mm	57
28.0 mm	56
20.0 mm	55
14.0 mm	53
10.0 mm	47
6.30 mm	43
5.00 mm	41
3.35 mm	39
2.00 mm	36
1.18 mm	33
630 µm	28
425 µm	23
300 µm	20
200 µm	18
150 µm	16
63 µm	15
20 µm	11
6 µm	8
2 µm	5

Non Engineering Description

Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse

Sample Proportions - %

Cobbles	40.1
Gravel	23.7
Sand	21.8
Silt	9.8
Clay	4.5

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	125
D60	63
D10	0.013

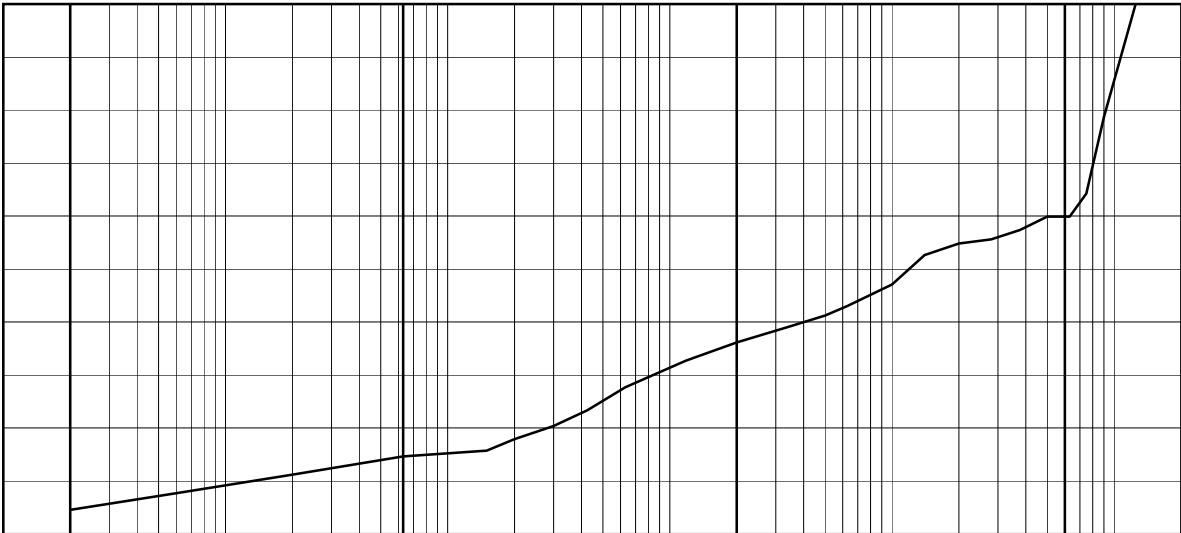
Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)4846.2

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator

Checked & Approved


RF

CD
18/01/2024


PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP11	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 0.70 Sample Type B	

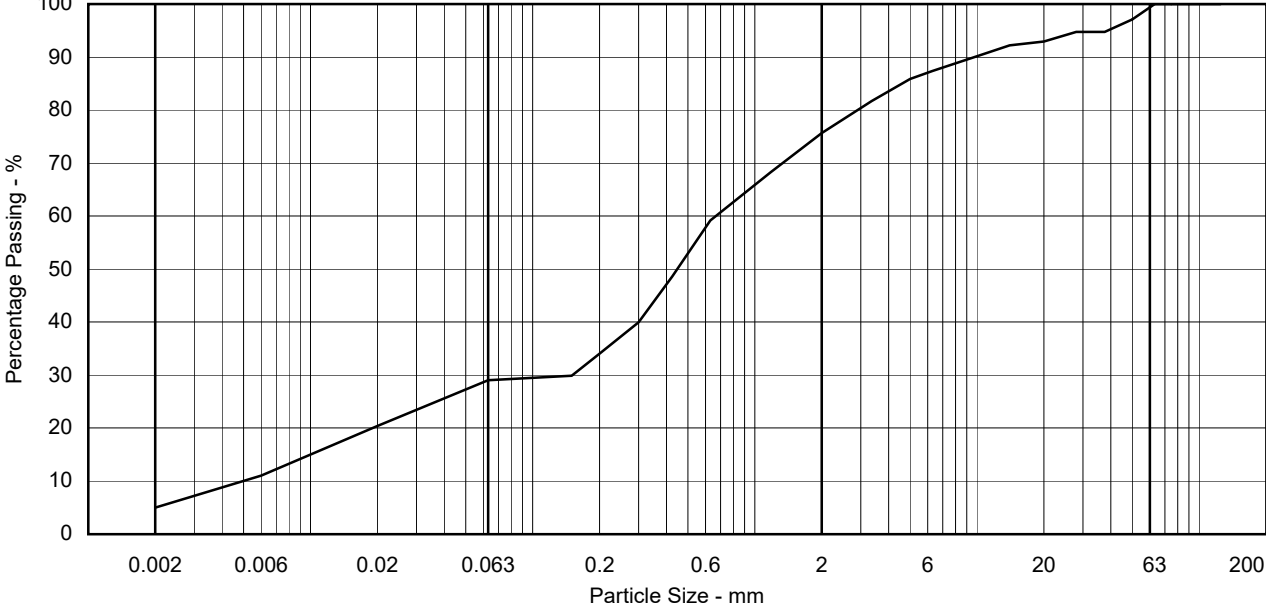
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	97
37.5 mm	95
28.0 mm	95
20.0 mm	93
14.0 mm	92
10.0 mm	90
6.30 mm	87
5.00 mm	86
3.35 mm	82
2.00 mm	76
1.18 mm	68
630 µm	59
425 µm	49
300 µm	40
200 µm	34
150 µm	30
63 µm	29
20 µm	20
6 µm	11
2 µm	5


Non Engineering Description	
Brown very silty very gravelly SAND. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	24.3
Sand	47.2
Silt	23.5
Clay	5.0
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	0.67
D10	0.0050
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 134.0	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 18/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP11	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.10 Sample Type B	

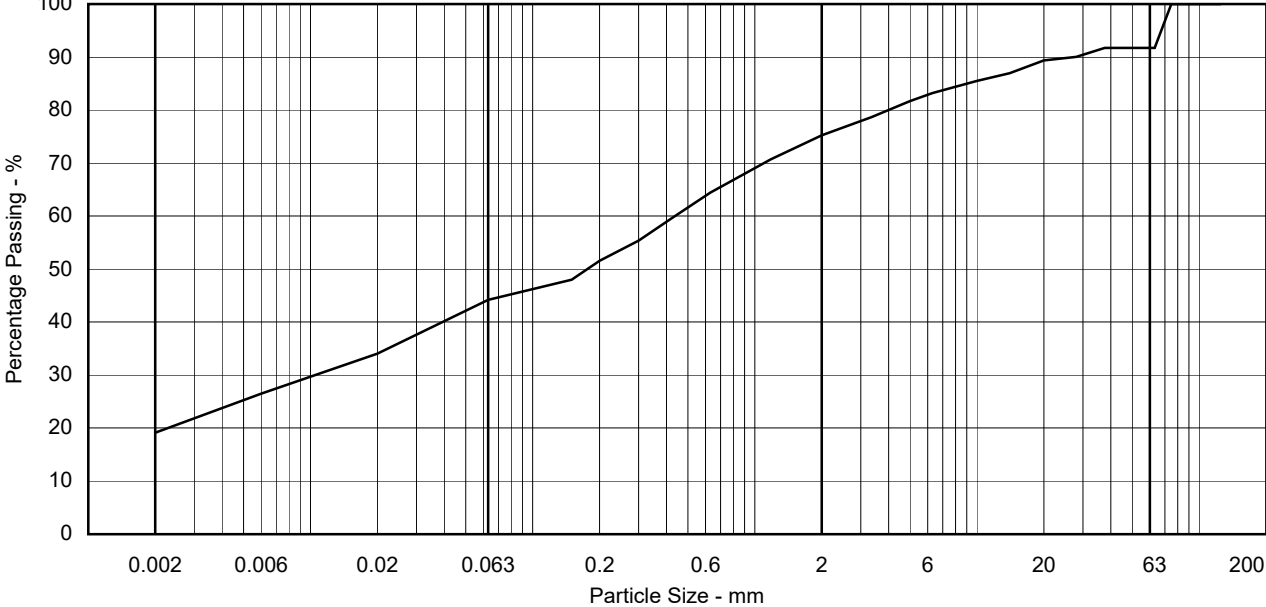
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	92
50.0 mm	92
37.5 mm	92
28.0 mm	90
20.0 mm	89
14.0 mm	87
10.0 mm	85
6.30 mm	83
5.00 mm	82
3.35 mm	79
2.00 mm	75
1.18 mm	71
630 µm	64
425 µm	60
300 µm	55
200 µm	52
150 µm	48
63 µm	44
20 µm	34
6 µm	26
2 µm	19

Non Engineering Description	
Brown slightly gravelly slightly sandy CLAY with cobbles. Gravel is fine to coarse	


Sample Proportions - %	
Cobbles	8.3
Gravel	16.5
Sand	31.7
Silt	24.4
Clay	19.1
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	75
D60	0.44
D10	
Uniformity Coefficient <small>(SHW series 600, Table 6/1, footnote 5)</small>	N/A

Notes
Sedimentation sample not pre-treated


Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Particle Size (mm)	Percentage Passing (%)
0.075	19
0.15	26
0.3	34
0.6	44
1.18	48
2.5	52
5.0	55
10.0	60
20.0	64
40.0	71
60.0	75
75.0	82
100.0	83
150.0	85
200.0	87
250.0	89
300.0	90
400.0	92
600.0	92
75.0	100

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 18/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP11	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 2.50 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	91
63.0 mm	85
50.0 mm	80
37.5 mm	75
28.0 mm	73
20.0 mm	71
14.0 mm	68
10.0 mm	65
6.30 mm	62
5.00 mm	60
3.35 mm	57
2.00 mm	55
1.18 mm	51
630 µm	45
425 µm	39
300 µm	35
200 µm	31
150 µm	28
63 µm	26
20 µm	23
6 µm	16
2 µm	8

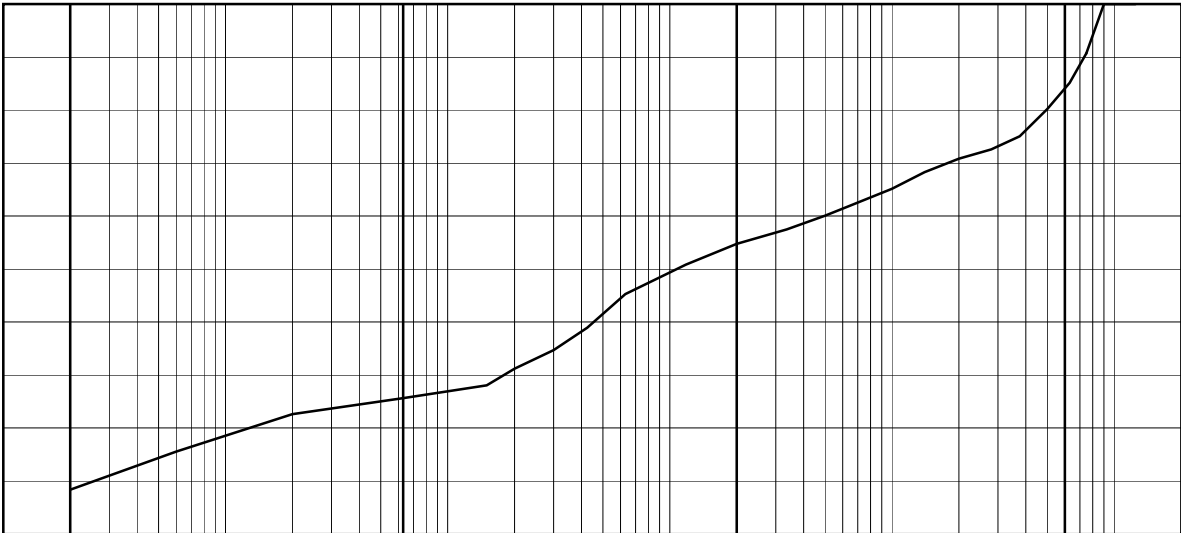
Non Engineering Description	
Brown very clayey SAND and GRAVEL with cobbles. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	14.9
Gravel	30.4
Sand	29.3
Silt	17.1
Clay	8.4
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	90
D60	5.0
D10	0.0026
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 1923.1	


Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 18/01/2024		

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SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP19

Sample Ref

Depth (m)1.00

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	95
37.5 mm	95
28.0 mm	94
20.0 mm	92
14.0 mm	92
10.0 mm	90
6.30 mm	84
5.00 mm	79
3.35 mm	77
2.00 mm	74
1.18 mm	70
630 µm	65
425 µm	60
300 µm	53
200 µm	48
150 µm	44
63 µm	43
20 µm	30
6 µm	21
2 µm	12

Non Engineering Description

Sample Proportions - %

Cobbles	0.0
Gravel	25.9
Sand	32.3
Silt	30.0
Clay	11.7

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	63
D60	0.43
D10	

Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)

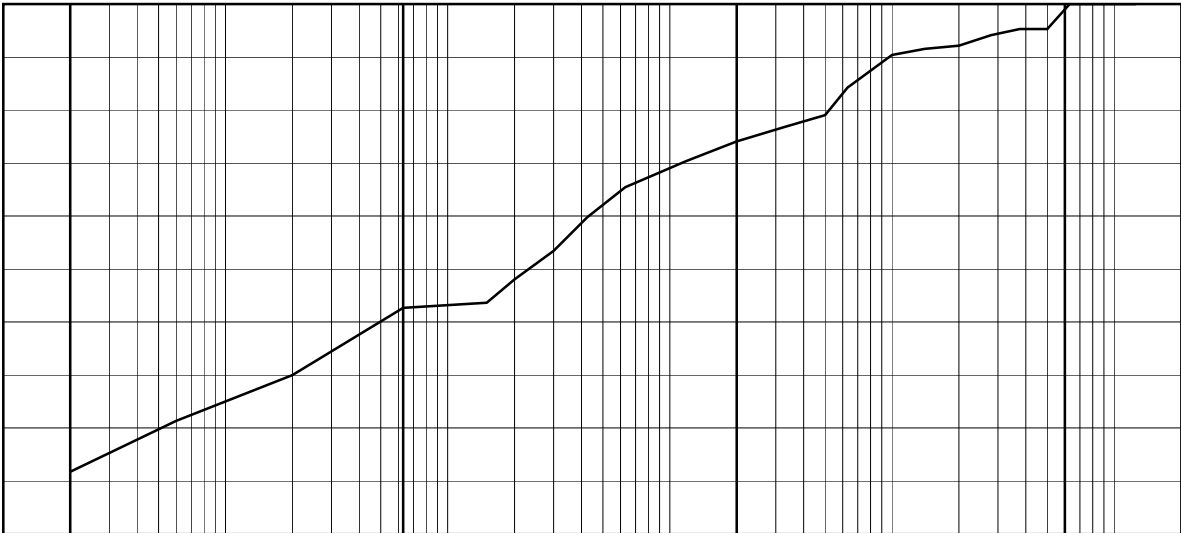
N/A

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator

Checked & Approved

SG


CD

18/01/2024


PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP20	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.40 Sample Type B	

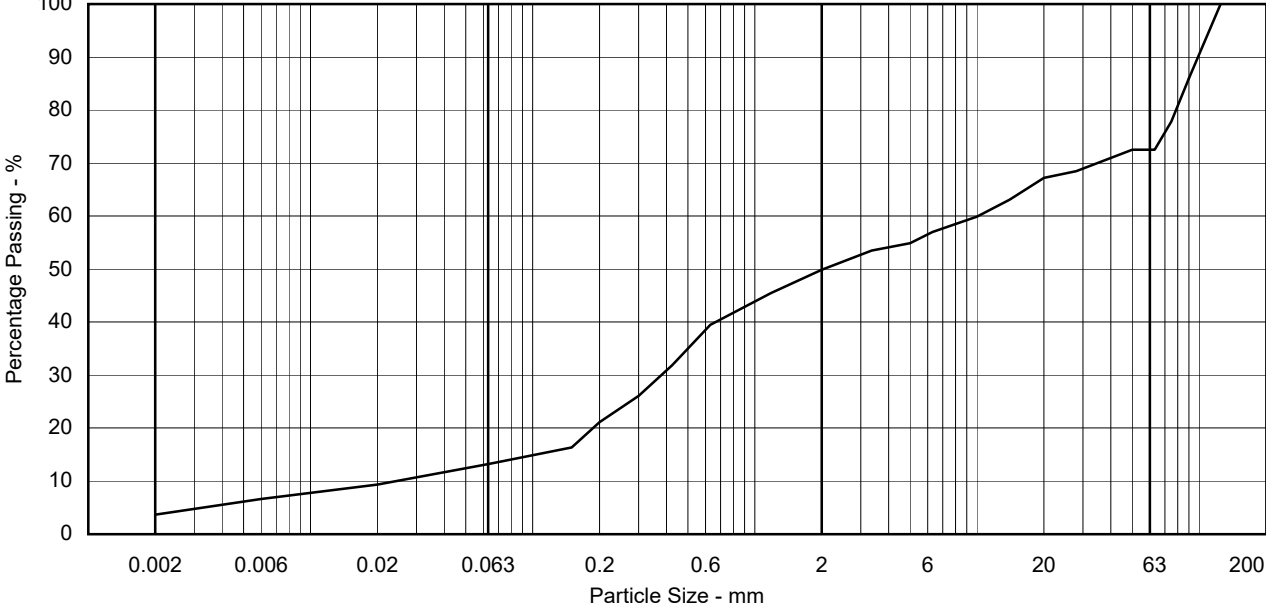
Particle Size	% Passing
125.0 mm	100
90.0 mm	86
75.0 mm	78
63.0 mm	72
50.0 mm	72
37.5 mm	71
28.0 mm	68
20.0 mm	67
14.0 mm	63
10.0 mm	60
6.30 mm	57
5.00 mm	55
3.35 mm	53
2.00 mm	50
1.18 mm	45
630 µm	39
425 µm	32
300 µm	26
200 µm	21
150 µm	16
63 µm	13
20 µm	9
6 µm	7
2 µm	4


Non Engineering Description	
Brown clayey SAND and GRAVEL with cobbles. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	27.5
Gravel	22.6
Sand	36.9
Silt	9.3
Clay	3.6
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	125
D60	10
D10	0.025
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 400.0	

Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 18/01/2024		

Sheet 1 of 1



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

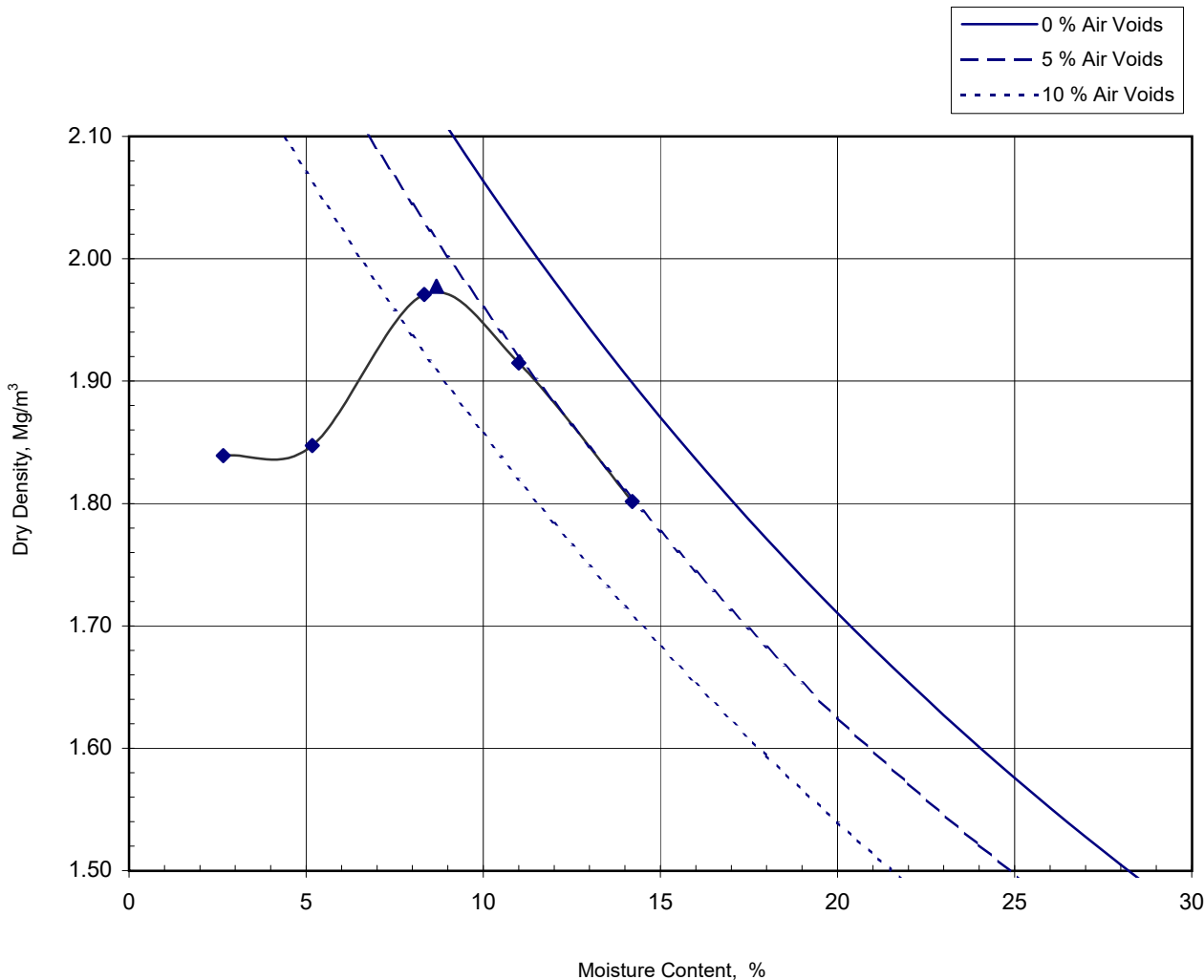
Contract No 26555

Hole TP02

Sample Ref

Depth (m) 0.70

Sample Type B



Non Engineering Description	Brown silty SAND and GRAVEL. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with some coarse gravel-size particles
Samples Used	Single
Mass Retained on 37.5 mm Sieve	9
Mass Retained on 20.0 mm Sieve	23
Particle Density - Assumed	2.60
Natural Moisture Content	17
Maximum Dry Density	1.98
Optimum Moisture Content	8.7

Originator

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SM

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18/01/2024

Moisture Content / Dry Density Relationship

BS1377:Part 4:1990 Clause 3.6





Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

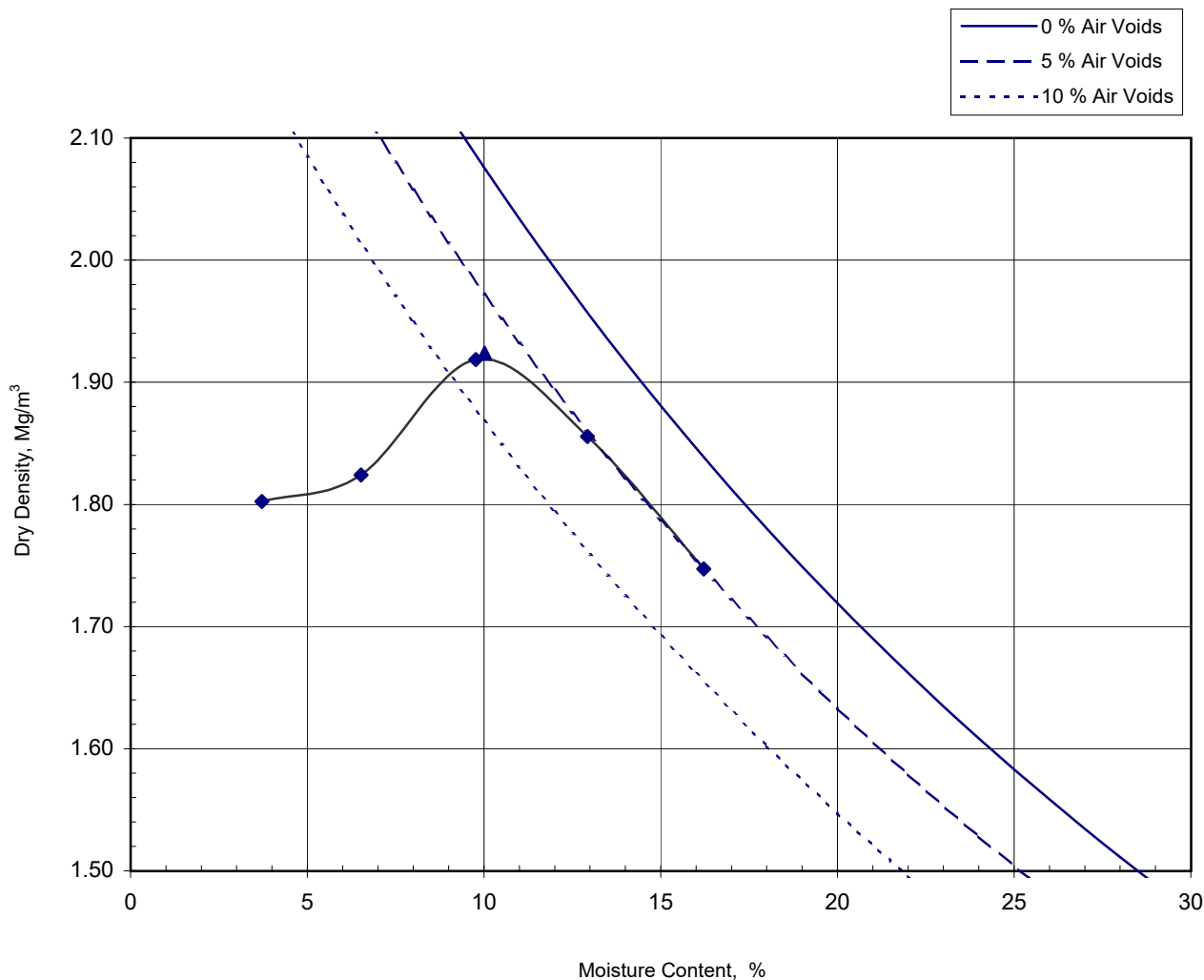
Contract No 26555

Hole TP19

Sample Ref

Depth (m) 1.10

Sample Type B



Non Engineering Description	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse
Preparation	Oven dried
Test Method	2.5kg Rammer for soils with some coarse gravel-size particles
Samples Used	Single
Mass Retained on 37.5 mm Sieve	% 3
Mass Retained on 20.0 mm Sieve	% 15
Particle Density - Assumed	Mg/m³ 2.62
Natural Moisture Content	% 16
Maximum Dry Density	Mg/m³ 1.92
Optimum Moisture Content	% 10.0

Originator

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18/01/2024

Moisture Content / Dry Density Relationship

BS1377:Part 4:1990 Clause 3.4





SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

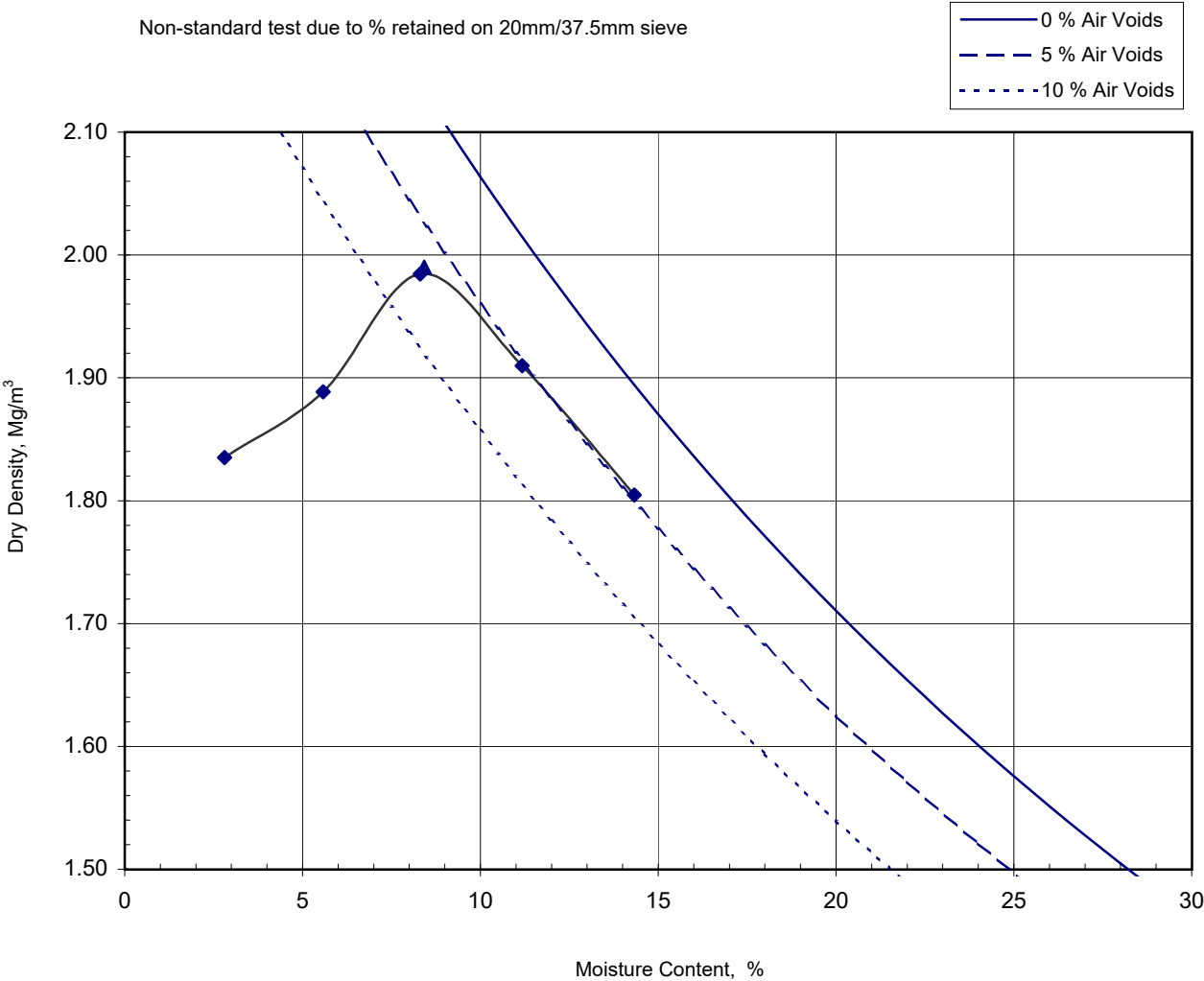
Contract No26555

HoleTP20

Sample Ref

Depth (m)1.40

Sample TypeB




Non Engineering Description	Brown clayey SAND and GRAVEL with cobbles. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with some coarse gravel-size particles
Samples Used	Single
Mass Retained on 37.5 mm Sieve	%28
Mass Retained on 20.0 mm Sieve	%31
Particle Density - Assumed	Mg/m³2.60
Natural Moisture Content	%13
Maximum Dry Density	Mg/m³1.99
Optimum Moisture Content	%8.4

OriginatorSM


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Moisture Content / Dry Density Relationship

BS1377:Part 4:1990 Clause 3.6

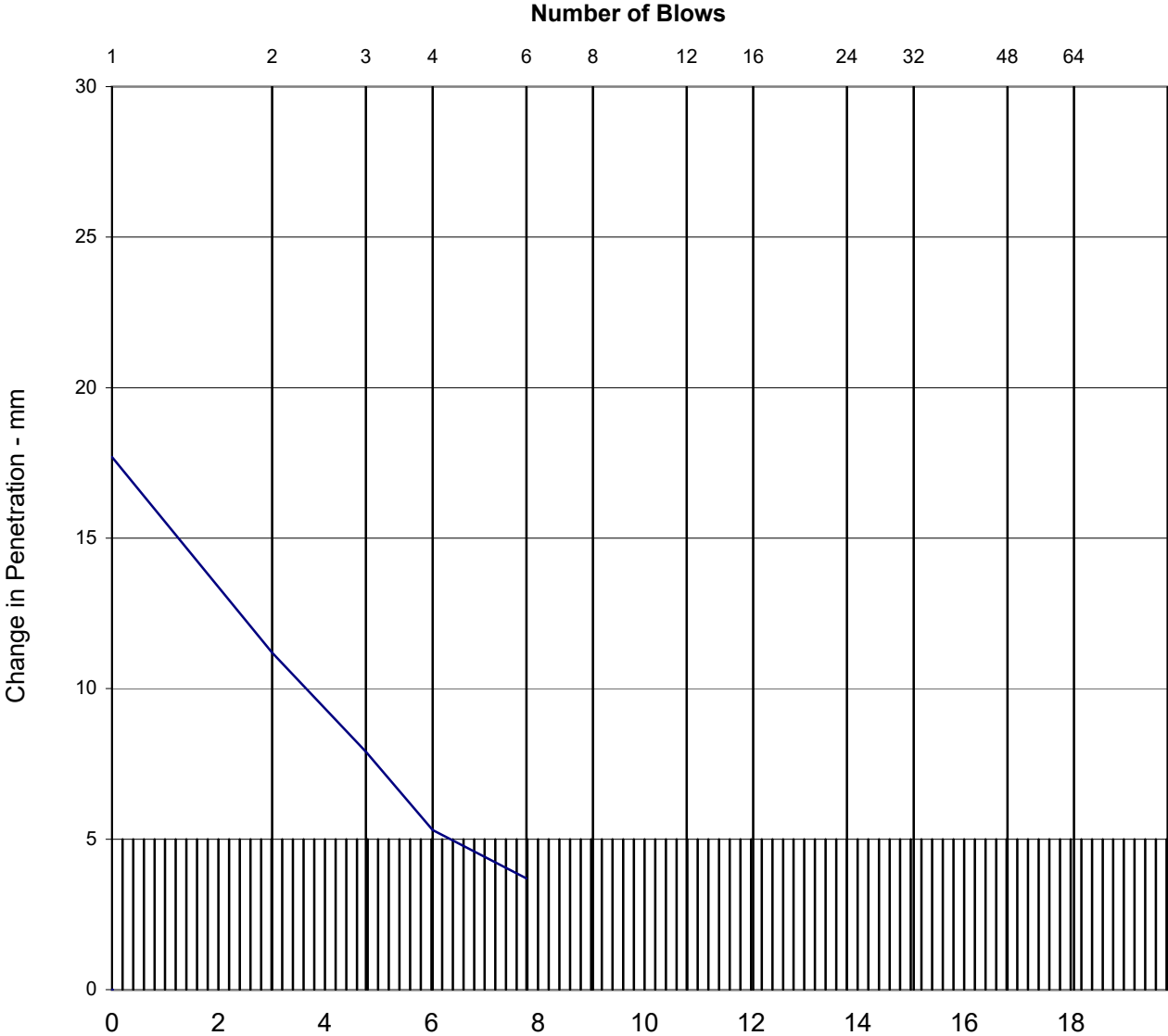


Sheet 1 of 1

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	TP02
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	0.70
			Sample Type	B


Number of Blows

Change in Penetration - mm




Moisture Condition Value

Non Engineering Description	Brown silty SAND and GRAVEL. Gravel is fine to coarse	
Determination No	1	
Moisture Condition Value	5.9	
Moisture Content	%	19
Method of determining MCV	Steepest fit line	
Mass retained on 20mm sieve	%	22.0
Notes		

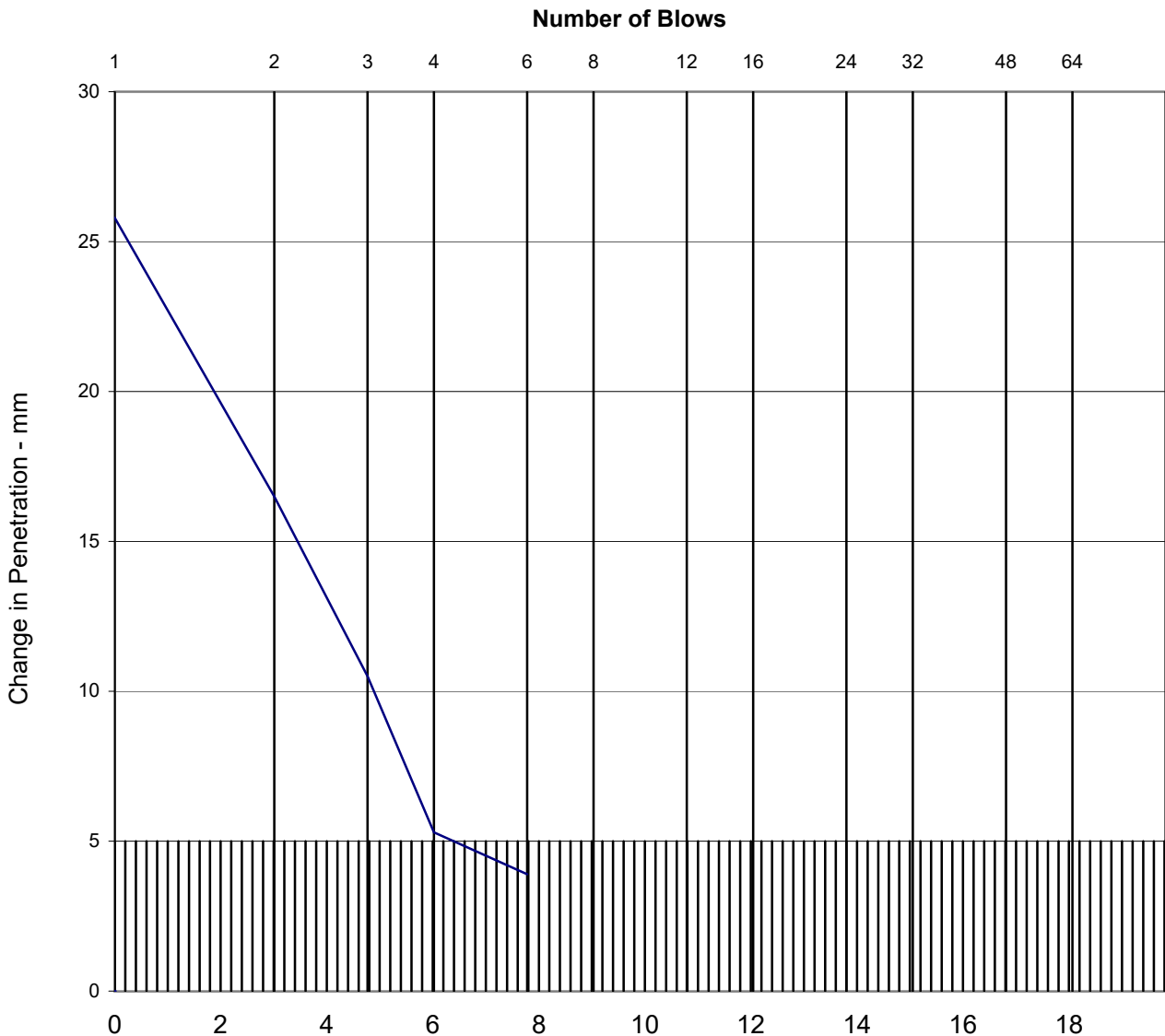
Originator	Checked & Approved	MOISTURE CONDITION VALUE BS1377:Part 4:1990 Clause 5.4	
SM	CD 18/01/2024		

Sheet 1 of 1

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	TP11
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	1.00
			Sample Type	B


Number of Blows

Change in Penetration - mm



Moisture Condition Value

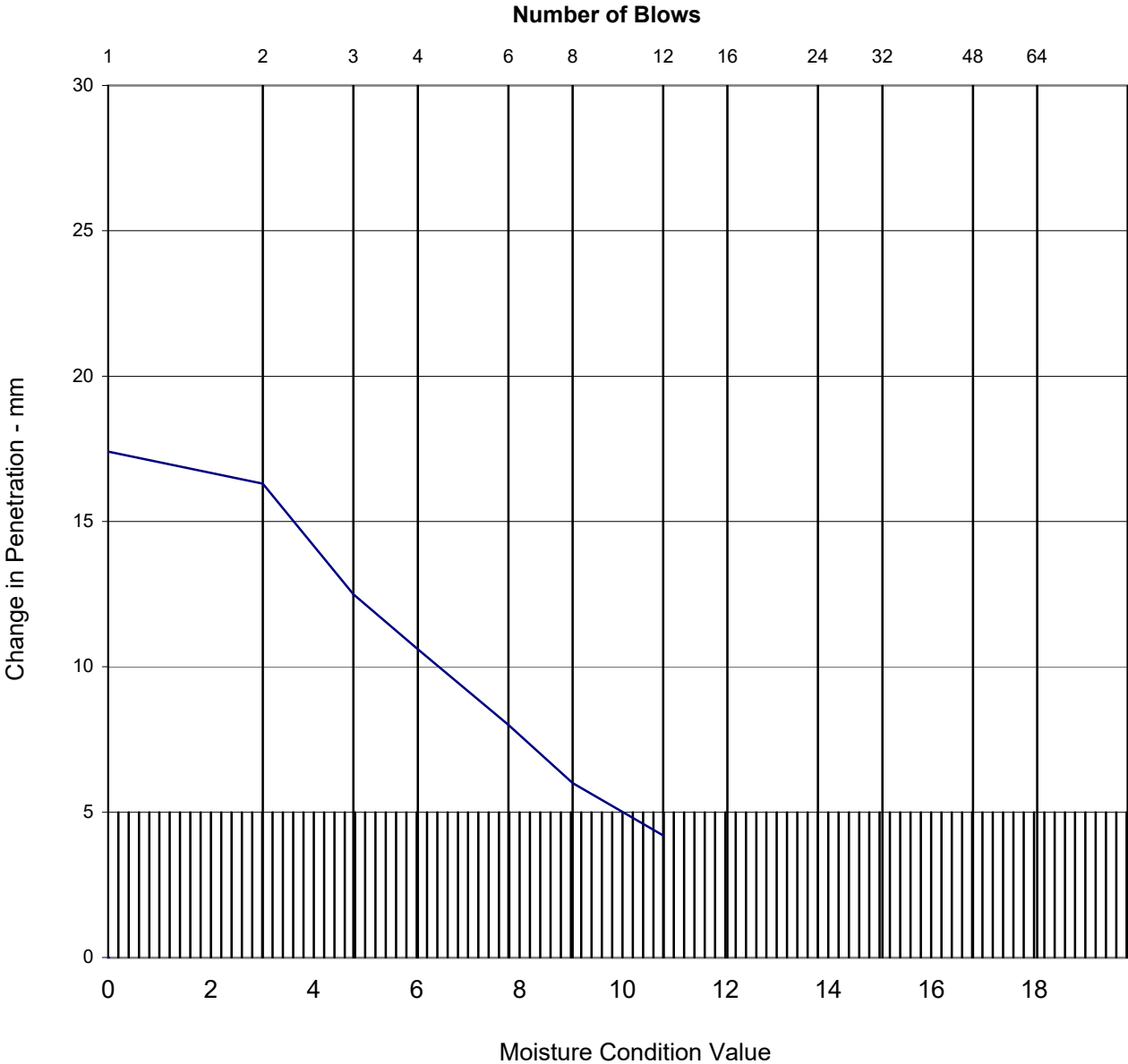
Non Engineering Description	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse	
Determination No	1	
Moisture Condition Value	6.1	
Moisture Content	%	14
Method of determining MCV	Steepest fit line	
Mass retained on 20mm sieve	%	11.0
Notes		

Originator	Checked & Approved	MOISTURE CONDITION VALUE BS1377:Part 4:1990 Clause 5.4	
SM	CD 18/01/2024		

Sheet 1 of 1



Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
Client	SHE Transmission plc	Hole ID	TP19
Engineer	SSE Perth Inveralmond HSE	Sample Ref	
		Depth (m)	1.10
		Sample Type	B

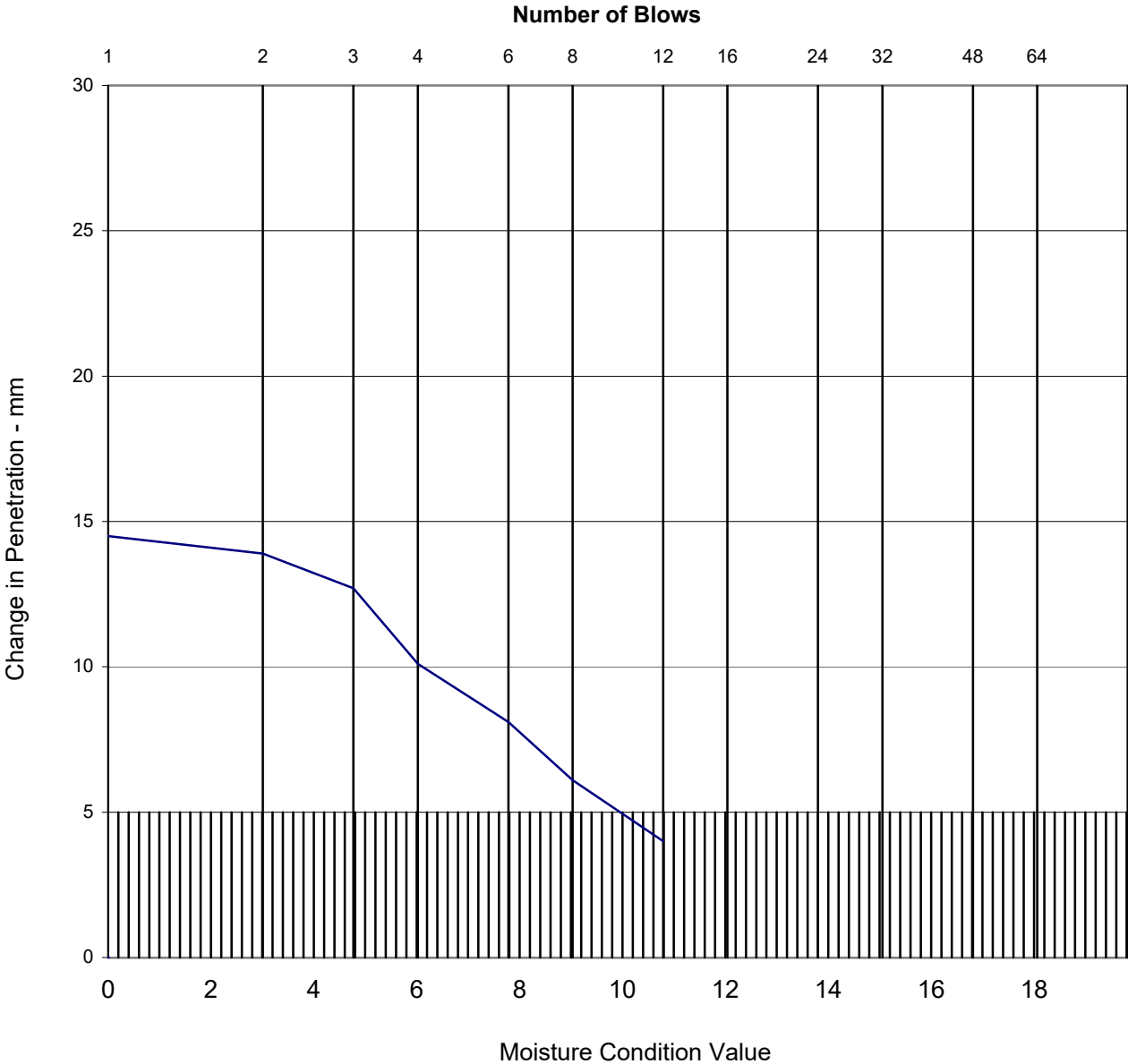


Non Engineering Description	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse	
Determination No	1	
Moisture Condition Value	8.2	
Moisture Content	%	17
Method of determining MCV	Steepest fit line	
Mass retained on 20mm sieve	%	7.0
Notes		

Originator	Checked & Approved	MOISTURE CONDITION VALUE BS1377:Part 4:1990 Clause 5.4	 Sheet 1 of 1
SM	 18/01/2024		



Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
Client	SHE Transmission plc	Hole ID	TP20
Engineer	SSE Perth Inveralmond HSE	Sample Ref	
		Depth (m)	1.40
		Sample Type	B



Non Engineering Description	Brown clayey SAND and GRAVEL with cobbles. Gravel is fine to coarse	
Determination No	1	
Moisture Condition Value	8.5	
Moisture Content	%	18
Method of determining MCV	Steepest fit line	
Mass retained on 20mm sieve	%	33.0
Notes		


Originator	Checked & Approved	MOISTURE CONDITION VALUE BS1377:Part 4:1990 Clause 5.4	
SM	 18/01/2024		
		Sheet 1 of 1	

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-3
Issue No 01

LABORATORY TEST REPORT



Project Name		LT520 BRACO WEST SUBSTATION	
Project Number		A15044-3	Date samples received 13/12/2023
Your Ref		26555	Date written instructions received 13/12/2023
Purchase Order		26555	Date testing commenced 18/12/2023
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	9	Determination of Water Content	Yes
	5	Particle Size Distribution	Yes
	4	Moisture Content / Dry Density Relationship	Yes
	4	Moisture Condition Value	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 19/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories : C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)		 19/01/2024	
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			




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				Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
				Client SHE Transmission plc			
				Engineer SSE Perth Inveralmond HSE			
Sample Identification							
Exploratory Hole	Depth m	Sample Ref	Sample Type				
TP04	0.60		B	2012986	Brown slightly grvaelly slighly sandy clayey SILT. Gravel is fine to coarse	13.7	
TP04	0.60		D	2012984	Brown slightly grvaelly slighly sandy clayey SILT. Gravel is fine to coarse	9.7	
TP04	1.60		B	2012989	Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse	16.9	
TP04	1.60		D	2012987	Brown silty SAND and GRAVEL. Gravel is fine to coarse	20.1	
TP05	2.00		B	2012990	Brown silty SAND and GRAVEL. Gravel is fine to coarse	13.9	
TP09	0.60		B	2012991	Brown slightly silty very sandy fine to coarse GRAVEL	18.4	
TP09	0.60		B	2012992	Brown slightly silty very sandy fine to coarse GRAVEL	17.5	
TP09	1.00		B	2012993	Brown slightly silty very sandy fine to coarse GRAVEL with cobbles	15.5	
TP09	1.50		B	2012994	Brown slightly silty very sandy fine to coarse GRAVEL	17.3	
Notes							
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014				
TP	CD 19/01/2024						
							Sheet 1 of 1



SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP04

Sample Ref

Depth (m)0.60

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	97
28.0 mm	93
20.0 mm	87
14.0 mm	84
10.0 mm	83
6.30 mm	80
5.00 mm	78
3.35 mm	77
2.00 mm	74
1.18 mm	71
630 µm	66
425 µm	61
300 µm	55
200 µm	48
150 µm	41
63 µm	39
20 µm	31
6 µm	17
2 µm	8

Non Engineering Description

Sample Proportions - %

Cobbles	0.0
Gravel	25.8
Sand	35.4
Silt	31.1
Clay	7.6

Particle Density - Assumed (Mg/m3)

2.65

Particle Diameter - mm

D100	50
D60	0.39
D10	0.0027

Uniformity Coefficient

(SHW series 600, Table 6/1, footnote 5)

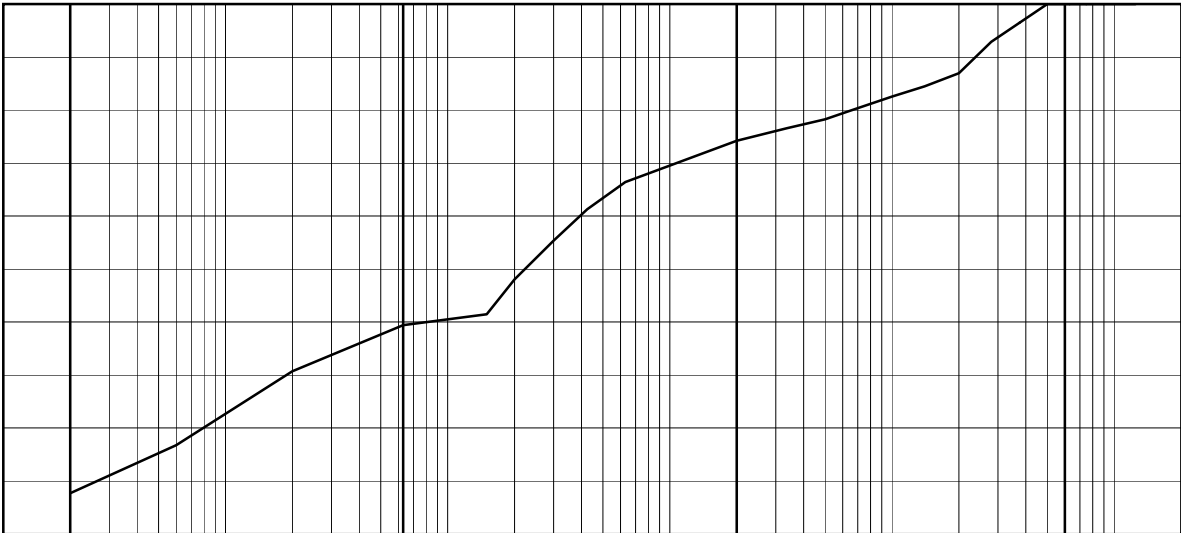
144.4

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator

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19/01/2024


PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP04	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.60 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	87
63.0 mm	83
50.0 mm	81
37.5 mm	78
28.0 mm	76
20.0 mm	68
14.0 mm	68
10.0 mm	67
6.30 mm	65
5.00 mm	63
3.35 mm	60
2.00 mm	56
1.18 mm	51
630 µm	45
425 µm	39
300 µm	35
200 µm	28
150 µm	23
63 µm	19
20 µm	15
6 µm	8
2 µm	4

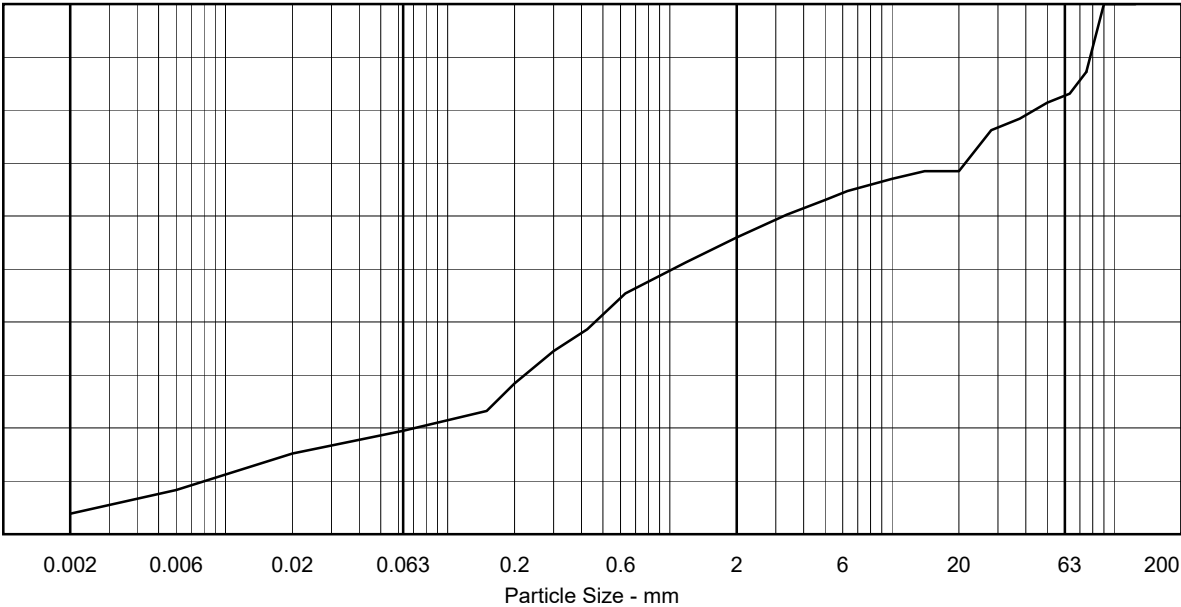
Non Engineering Description	
Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	16.9
Gravel	27.1
Sand	36.8
Silt	15.4
Clay	3.8
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	90
D60	3.3
D10	0.0081
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 407.4	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 19/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole TP05	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 2.00 Sample Type B	

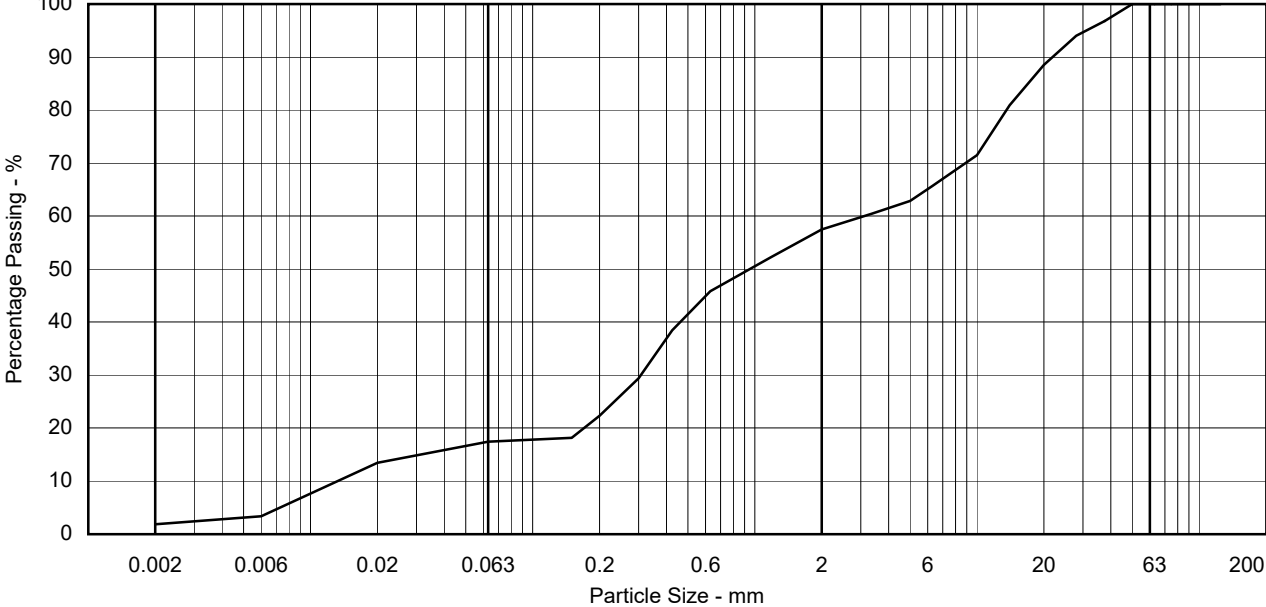
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	97
28.0 mm	94
20.0 mm	89
14.0 mm	81
10.0 mm	72
6.30 mm	66
5.00 mm	63
3.35 mm	60
2.00 mm	57
1.18 mm	52
630 µm	46
425 µm	38
300 µm	29
200 µm	22
150 µm	18
63 µm	17
20 µm	13
6 µm	3
2 µm	2


Non Engineering Description	
Brown silty SAND and GRAVEL. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	42.6
Sand	40.3
Silt	15.4
Clay	1.8
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	50
D60	3.1
D10	0.013
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 238.5	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
SG	CD 19/01/2024		

Sheet 1 of 1



SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleTP09

Sample Ref

Depth (m)0.60

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	79
37.5 mm	74
28.0 mm	69
20.0 mm	62
14.0 mm	49
10.0 mm	42
6.30 mm	34
5.00 mm	30
3.35 mm	28
2.00 mm	26
1.18 mm	25
630 µm	21
425 µm	17
300 µm	12
200 µm	7
150 µm	5
63 µm	2

Non Engineering Description

Brown slightly silty very sandy fine to coarse GRAVEL

Sample Proportions - %

Cobbles	0.0
Gravel	74.0
Sand	23.6
Silt & Clay	2.4

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

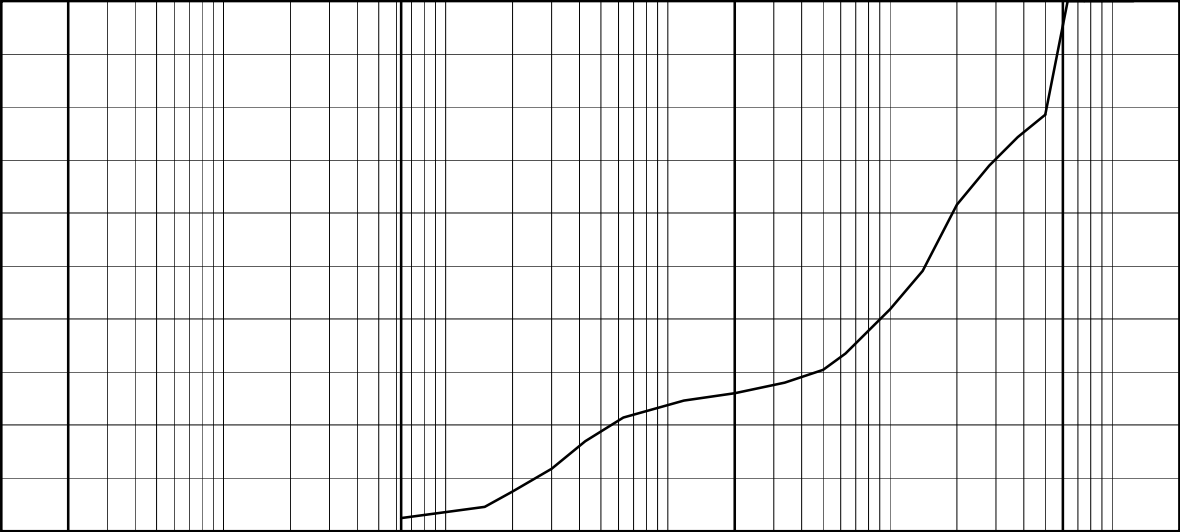
D100	63
D60	19
D10	0.26
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)	73.1

Notes

Sample does not comply with BS EN ISO 17892-4 minimum mass requirements

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator


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19/01/2024

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method



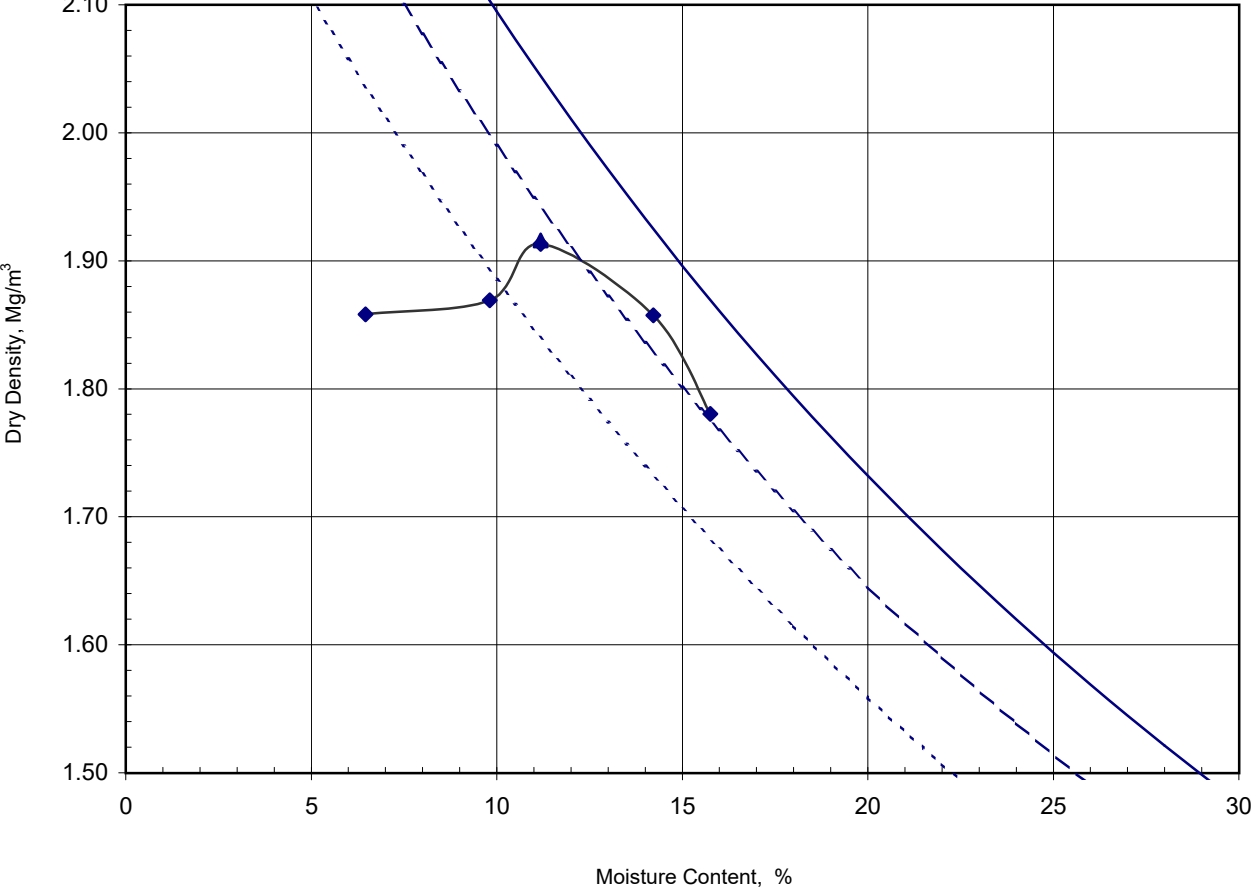
Sheet 1 of 1

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole	TP04
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	0.60
			Sample Type	B


— 0 % Air Voids

- - 5 % Air Voids


... 10 % Air Voids



Non Engineering Description	Brown slightly grvaelly slightly sandy clayey SILT. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with some coarse gravel-size particles
Samples Used	Single
Mass Retained on 37.5 mm Sieve	4
Mass Retained on 20.0 mm Sieve	10
Particle Density - Assumed	2.65
Natural Moisture Content	14
Maximum Dry Density	1.92
Optimum Moisture Content	11.2

Originator	Checked & Approved	Moisture Content / Dry Density Relationship BS1377:Part 4:1990 Clause 3.6	
NW	CD 19/01/2024		

Sheet 1 of 1



SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

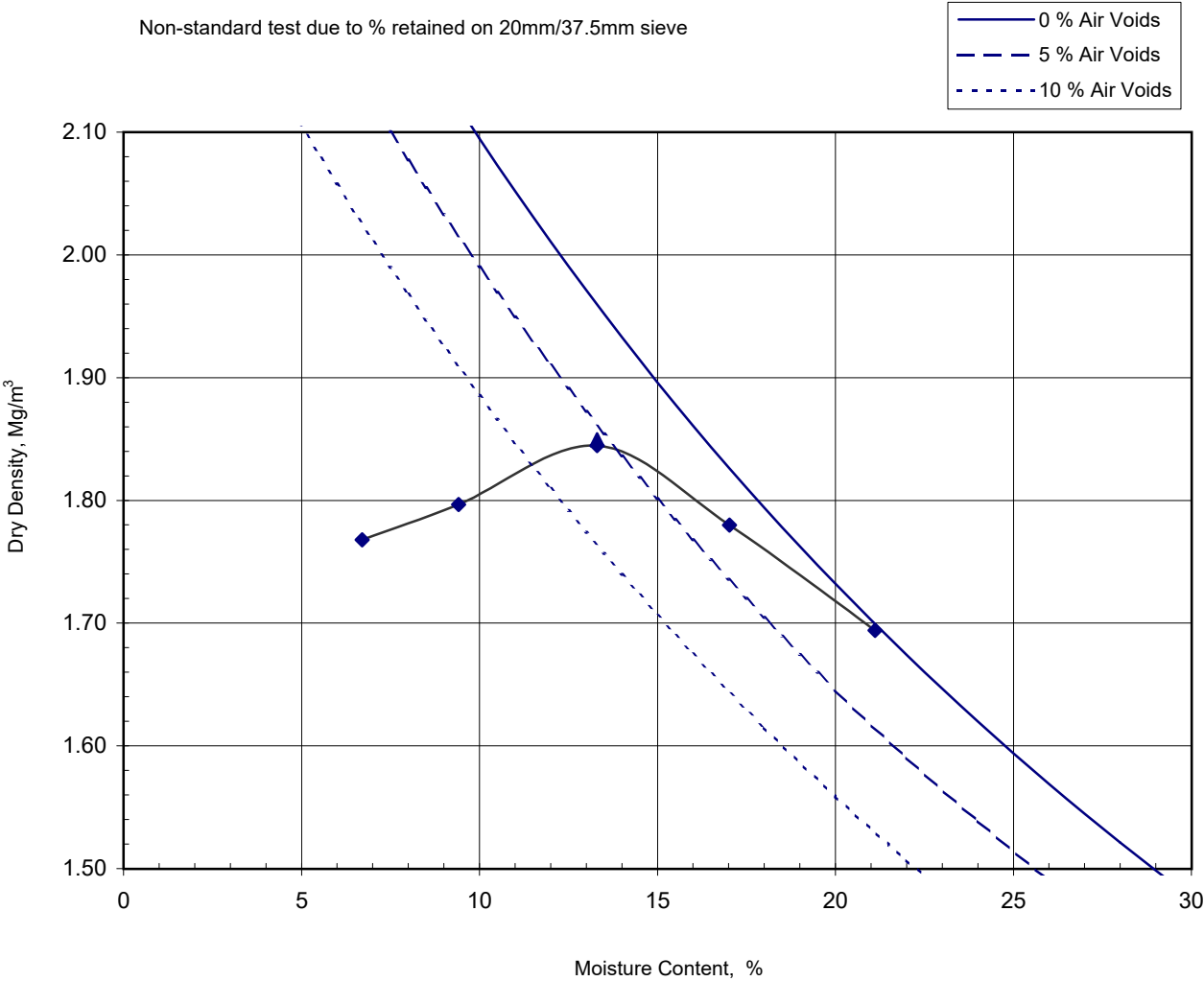
Contract No26555

HoleTP04

Sample Ref

Depth (m)1.60

Sample TypeB



Non Engineering Description	Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with some coarse gravel-size particles
Samples Used	Single
Mass Retained on 37.5 mm Sieve	% 19
Mass Retained on 20.0 mm Sieve	% 28
Particle Density - Assumed	Mg/m³ 2.65
Natural Moisture Content	% 17
Maximum Dry Density	Mg/m³ 1.85
Optimum Moisture Content	% 13.3

Originator


NW

Checked & Approved


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19/01/2024

Moisture Content / Dry Density Relationship

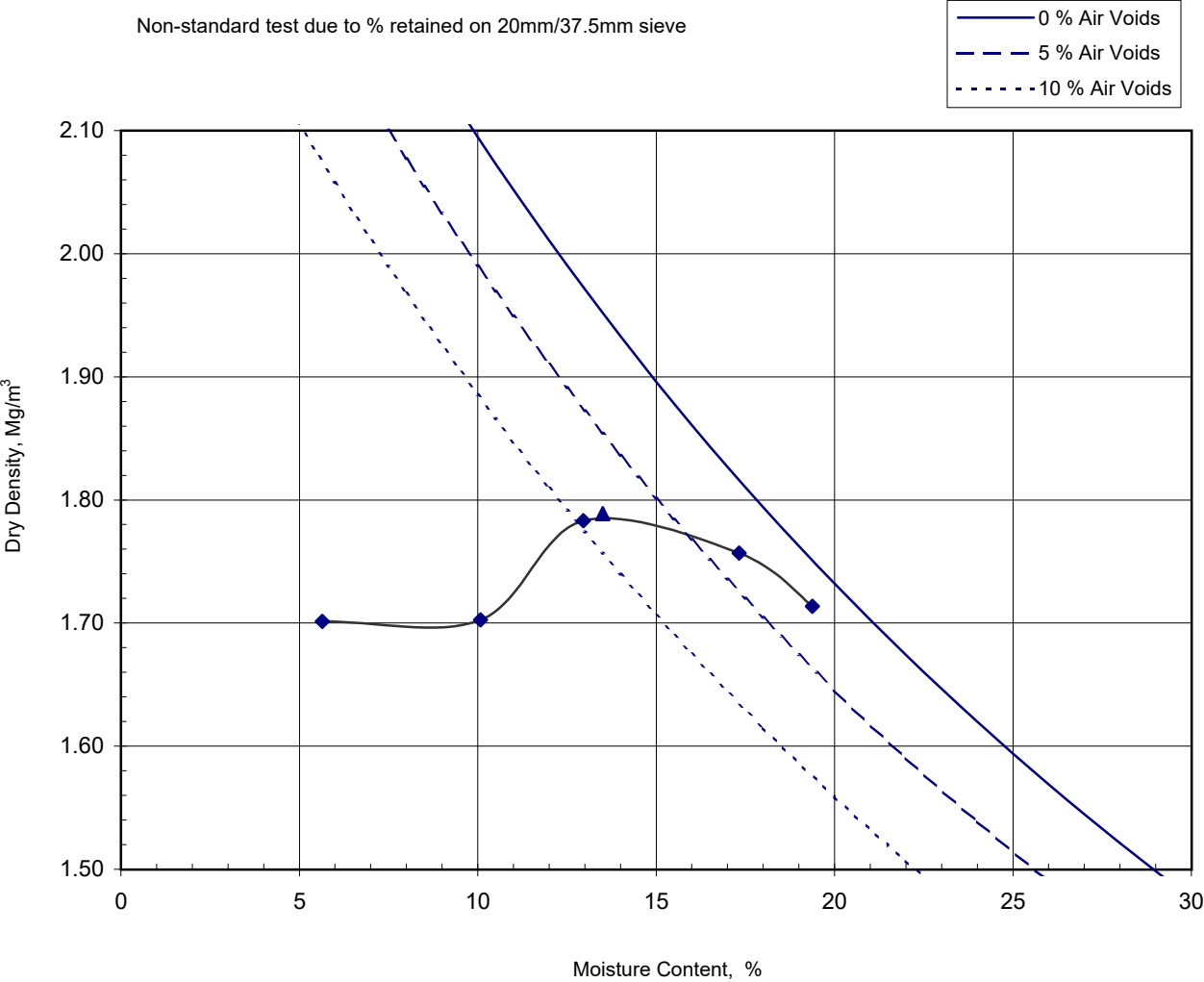
BS1377:Part 4:1990 Clause 3.6



Sheet 1 of 1


	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole	TP09
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	0.60
			Sample Type	B

Non-standard test due to % retained on 20mm/37.5mm sieve




—	0 % Air Voids
- - -	5 % Air Voids
. . .	10 % Air Voids

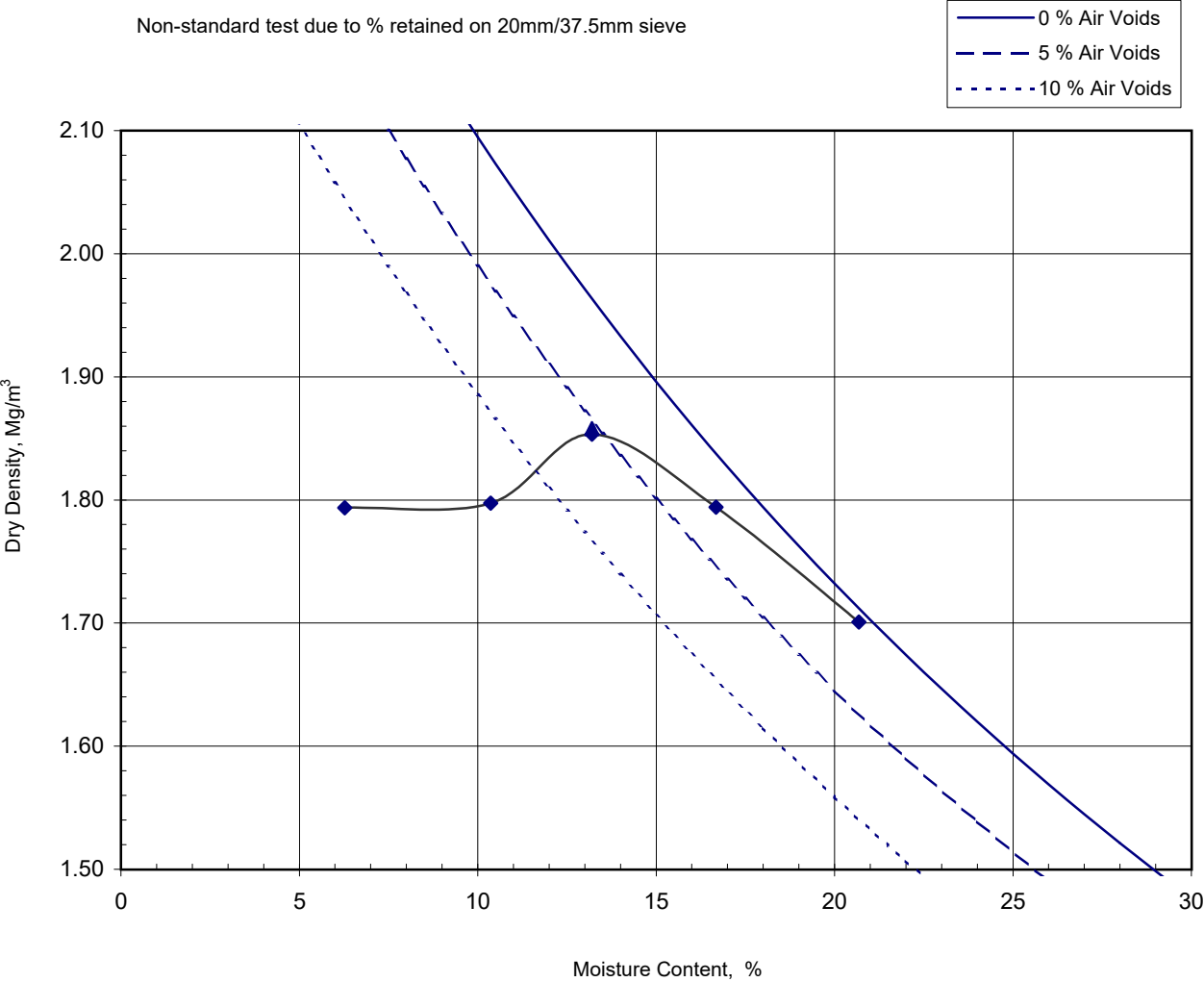
Non Engineering Description	Brown slightly silty very sandy fine to coarse GRAVEL
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with some coarse gravel-size particles
Samples Used	Single
Mass Retained on 37.5 mm Sieve	%24
Mass Retained on 20.0 mm Sieve	%37
Particle Density - Assumed	Mg/m³2.65
Natural Moisture Content	%18
Maximum Dry Density	Mg/m³1.79
Optimum Moisture Content	%13.5

Originator	Checked & Approved	Moisture Content / Dry Density Relationship BS1377:Part 4:1990 Clause 3.6	
NW	CD 19/01/2024		

Sheet 1 of 1


	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole	TP09
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	1.50
			Sample Type	B

Non-standard test due to % retained on 20mm/37.5mm sieve




Moisture Content (%)	Dry Density (Mg/m³)
6.5	1.79
10.5	1.80
13.2	1.86
16.5	1.79
20.5	1.70

Non Engineering Description	Brown slightly silty very sandy fine to coarse GRAVEL
Preparation	Oven dried
Test Method	-
Samples Used	Single
Mass Retained on 37.5 mm Sieve	% 16
Mass Retained on 20.0 mm Sieve	% 30
Particle Density - Assumed	Mg/m³ 2.65
Natural Moisture Content	% 17
Maximum Dry Density	Mg/m³ 1.86
Optimum Moisture Content	% 13.2

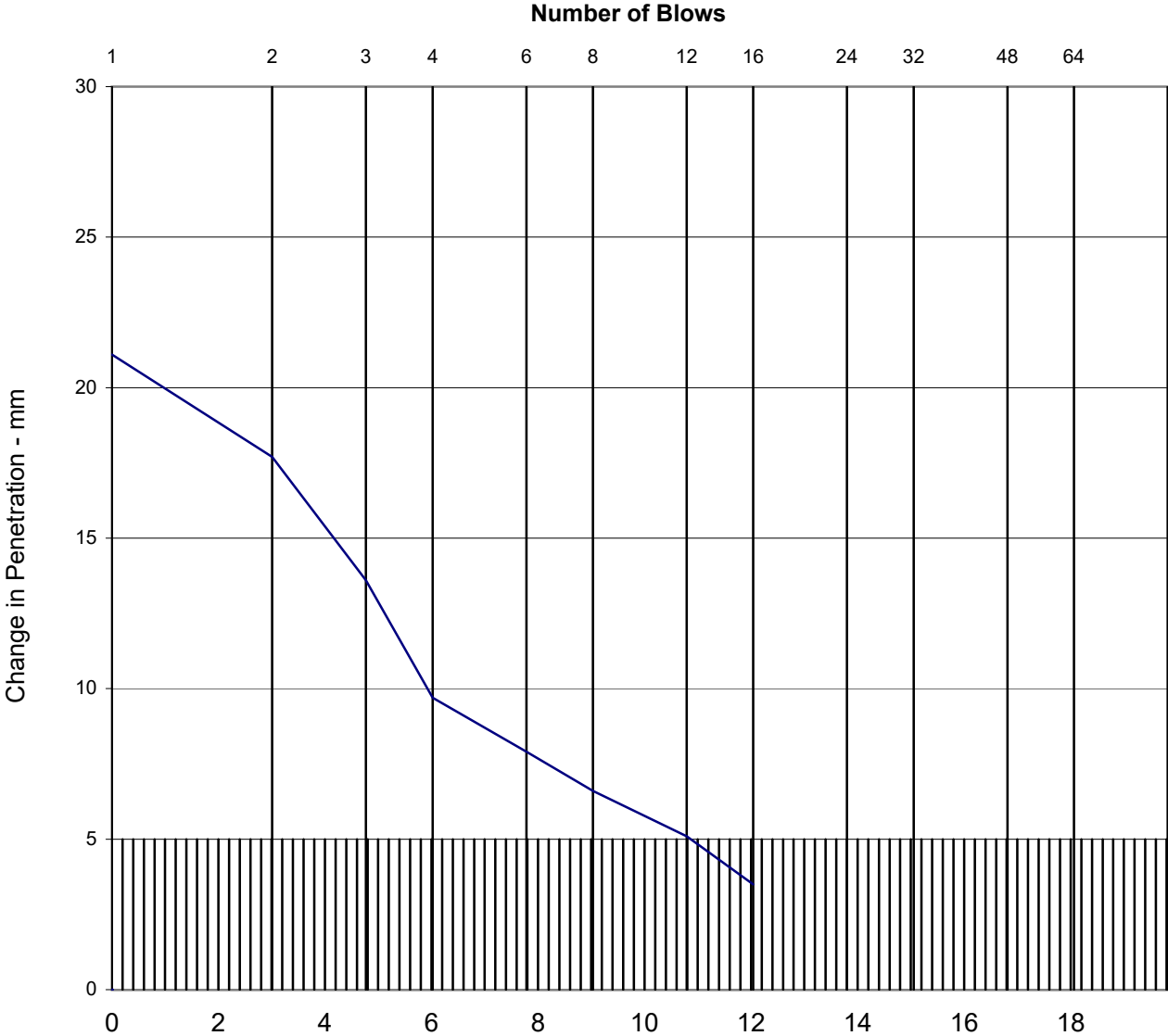
Originator	Checked & Approved	Moisture Content / Dry Density Relationship BS1377:Part 4:1990 Clause	
NW	CD 19/01/2024		

Sheet 1 of 1

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	TP04
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	0.60
			Sample Type	B


Number of Blows

Change in Penetration - mm




Moisture Condition Value

Non Engineering Description	Brown slightly grvaelly slightly sandy clayey SILT. Gravel is fine to coarse	
Determination No	1	
Moisture Condition Value	7.5	
Moisture Content	%	17
Method of determining MCV	Steepest fit line	
Mass retained on 20mm sieve	%	28.0
Notes		

Originator	Checked & Approved	MOISTURE CONDITION VALUE BS1377:Part 4:1990 Clause 5.4	
SM	CD 19/01/2024		

Sheet 1 of 1



SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

Hole IDTP04

Sample Ref

Depth (m)1.60

Sample TypeB

Number of Blows


123468121624324864

Change in Penetration - mm

302520151050

Moisture Condition Value

024681012141618




Non Engineering Description	Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse
Determination No	1
Moisture Condition Value	7.5
Moisture Content	%16
Method of determining MCV	Steepest fit line
Mass retained on 20mm sieve	%28.0
Notes	

Originator


SM

Checked & Approved



19/01/2024

MOISTURE CONDITION VALUE

BS1377:Part 4:1990 Clause 5.4

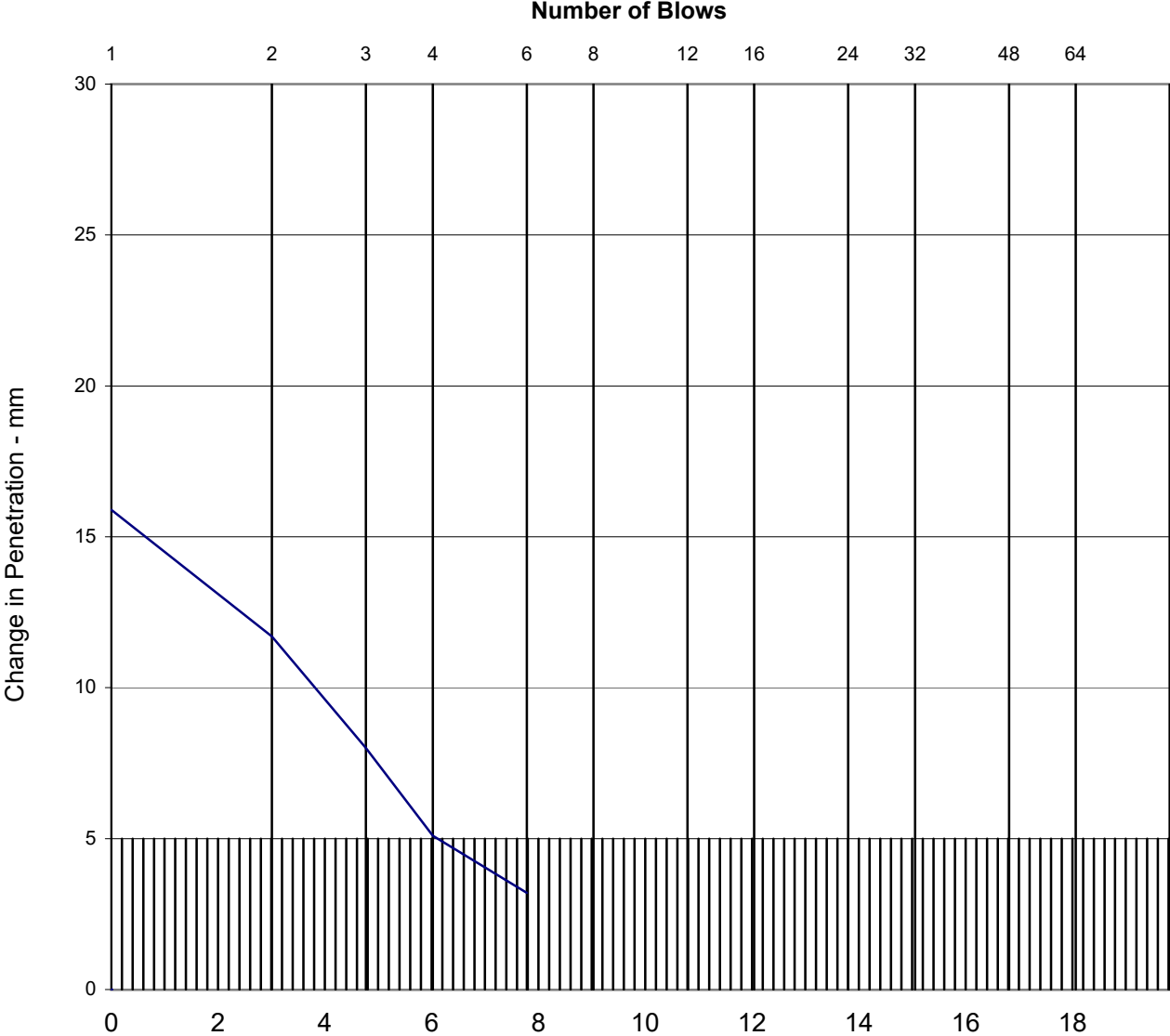


Sheet 1 of 1

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	TP09
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	0.60
			Sample Type	B


Number of Blows

Change in Penetration - mm




Moisture Condition Value

Non Engineering Description	Brown slightly silty very sandy fine to coarse GRAVEL
Determination No	1
Moisture Condition Value	6.1
Moisture Content	% 21
Method of determining MCV	Steepest fit line
Mass retained on 20mm sieve	% 31.3
Notes	

Originator	Checked & Approved	MOISTURE CONDITION VALUE BS1377:Part 4:1990 Clause 5.4	
SM	CD 19/01/2024		

Sheet 1 of 1



SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

Hole IDTP09

Sample Ref

Depth (m)1.50

Sample TypeB

Number of Blows

123468121624324864

Change in Penetration - mm

302520151050

Moisture Condition Value

024681012141618

Non Engineering Description	Brown slightly silty very sandy fine to coarse GRAVEL
Determination No	1
Moisture Condition Value	11.7
Moisture Content	%18
Method of determining MCV	Steepest fit line
Mass retained on 20mm sieve	%28.4
Notes	

Originator

SM


Checked & Approved

CD

19/01/2024

MOISTURE CONDITION VALUE

BS1377:Part 4:1990 Clause 5.4



Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-4
Issue No 01

LABORATORY TEST REPORT



Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-4	Date samples received	13/12/2023
Your Ref	26555	Date written instructions received	13/12/2023
Purchase Order	26555	Date testing commenced	18/12/2023
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	2	Determination of Water Content	Yes
	2	Atterberg Limit	Yes
	2	Particle Size Distribution	Yes
	1	Chemical Analysis	s/c - Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 22/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories : C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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Head Office : Whistleberry Road, Hamilton, Glasgow, Scotland, ML3 0HP

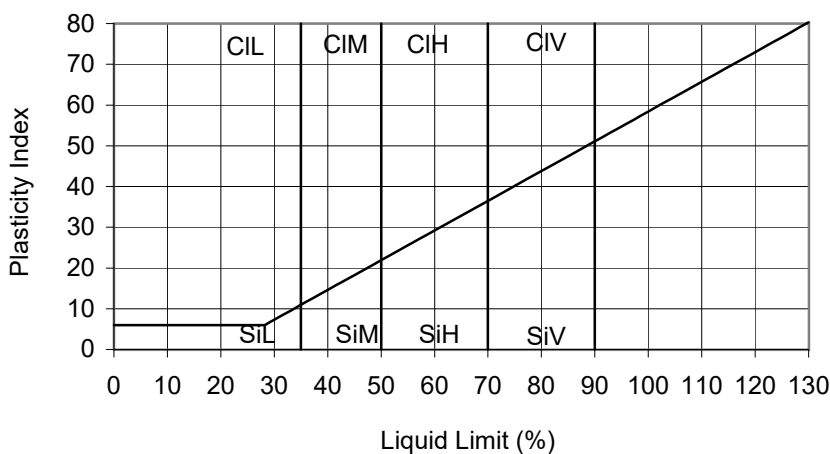
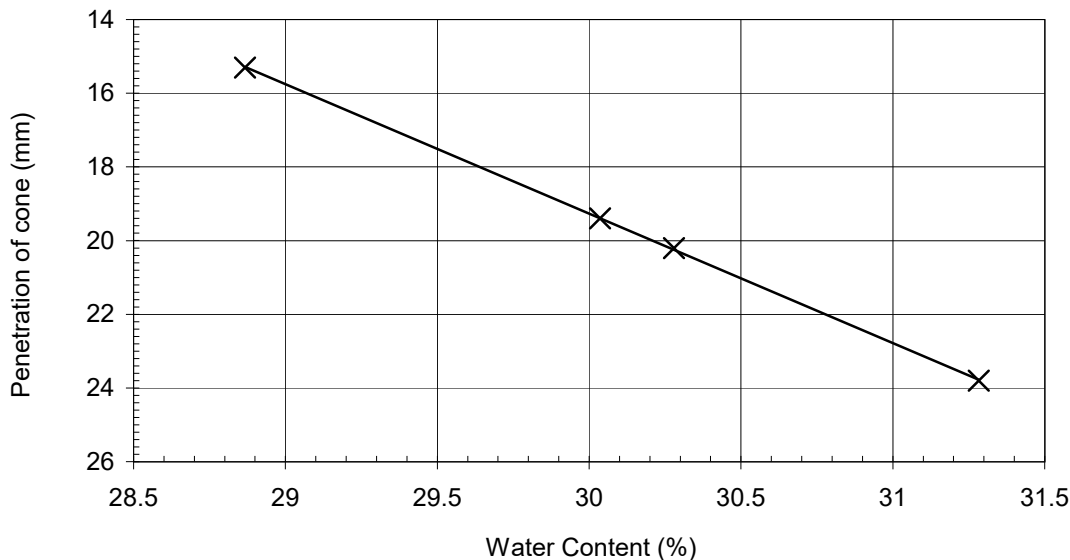
				Site LT520 BRACO WEST SUBSTATION		Contract No 26555		
				Client SHE Transmission plc				
				Engineer SSE Perth Inveralmond HSE				
Sample Identification								
Exploratory Hole	Depth m	Sample Ref	Sample Type					
BH01	1.20		D	2012996	Brown silty SAND and GRAVEL. Gravel is fine to coarse		20.5	
BH01	2.70		D	2012998	Brown silty SAND and GRAVEL. Gravel is fine to coarse		15.8	
Notes								
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014					
TP	CD 22/01/2024							
								Sheet 1 of 1



Site	LT520 BRACO WEST SUBSTATION	Contract No.	26555
Client	SHE Transmission plc	Hole ID	BH01
Engineer	SSE Perth Inveralmond HSE	Sample Ref	
		Depth (m)	1.20
		Sample Type	D

Non Engineering Description : Brown silty SAND and GRAVEL. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Sample was determined to be Non-Plastic after preparation
Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 20.5 %
Percentage retained on 425µm sieve : 66 %
Liquid Limit : 30 %
Plastic Limit : Non-Plastic %

Equivalent water content of material passing 425µm sieve : 60.3 %

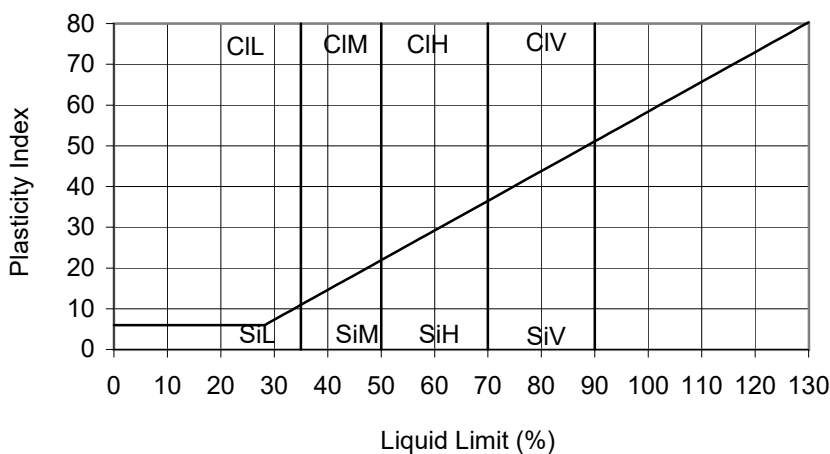
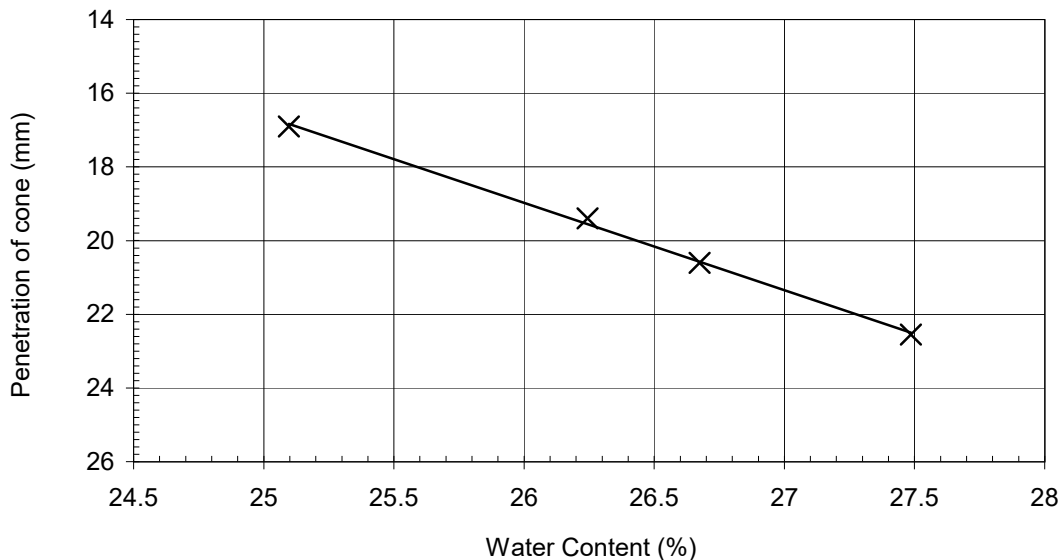
Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	CD 22/01/2024		



Site	LT520 BRACO WEST SUBSTATION	Contract No.	26555
Client	SHE Transmission plc	Hole ID	BH01
Engineer	SSE Perth Inveralmond HSE	Sample Ref	
		Depth (m)	2.70
		Sample Type	D

Non Engineering Description : Brown silty SAND and GRAVEL. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving




Sample was determined to be Non-Plastic after preparation
Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 15.8 %
Percentage retained on 425µm sieve : 43 %
Liquid Limit : 26 %
Plastic Limit : Non-Plastic %

Equivalent water content of material passing 425µm sieve : 27.7 %

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	CD 22/01/2024		

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH01	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.20 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	96
37.5 mm	92
28.0 mm	84
20.0 mm	78
14.0 mm	75
10.0 mm	71
6.30 mm	63
5.00 mm	59
3.35 mm	57
2.00 mm	53
1.18 mm	47
630 µm	41
425 µm	34
300 µm	25
200 µm	19
150 µm	12
63 µm	9

Non Engineering Description

Brown silty SAND and GRAVEL. Gravel is fine to coarse

Sample Proportions - %

Cobbles	0.0
Gravel	46.9
Sand	44.1
Silt & Clay	9.0

Particle Density - Assumed (Mg/m3)2.65

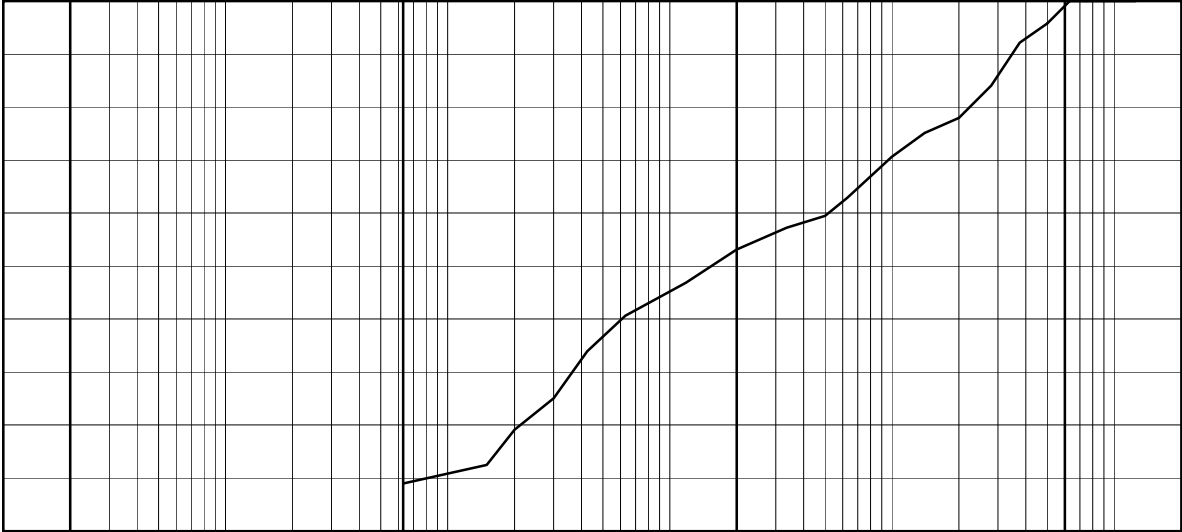
Particle Diameter - mm

D100	63
D60	5.2
D10	0.082
Uniformity Coefficient <small>(SHW series 600, Table 6/1, footnote 5)</small>	63.4


Notes

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method	
RF	CD 22/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH01	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 2.70 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	97
37.5 mm	97
28.0 mm	94
20.0 mm	91
14.0 mm	85
10.0 mm	81
6.30 mm	74
5.00 mm	68
3.35 mm	67
2.00 mm	64
1.18 mm	61
630 µm	57
425 µm	51
300 µm	44
200 µm	34
150 µm	26
63 µm	23
20 µm	10
6 µm	6
2 µm	3

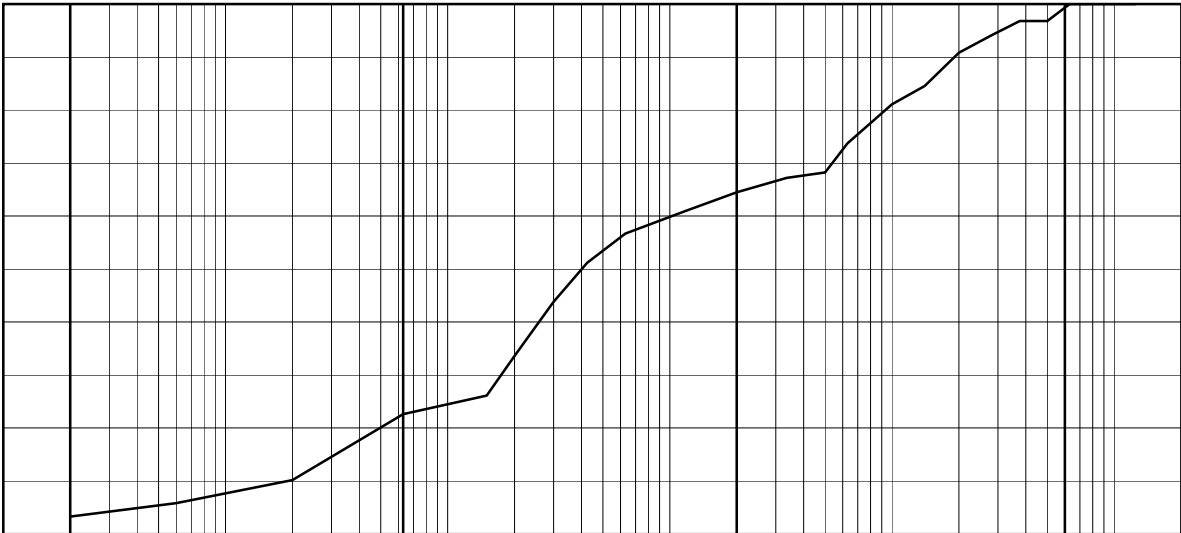
Non Engineering Description	
Brown silty SAND and GRAVEL. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	35.5
Sand	42.7
Silt	18.5
Clay	3.2
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	1.0
D10	0.019
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 52.6	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 22/01/2024		

Sheet 1 of 1



Summary of Chemical Analysis

Soil Samples

Our Ref 23-29978

Client Ref A15044-4

Contract Title

Lab No	2280106
Sample ID	BH01
Depth	1.20
Other ID	2012996
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units
Inorganics			
Organic matter	DETSC 2002#	0.1	%

Information in Support of the Analytical Results

Our Ref 23-29978

Client Ref A15044-4

Contract

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2280106	BH01 1.20 SOIL		PT 500ml	Sample date not supplied, Organic Matter (Manual) (28 days)	

Key: P-Plastic T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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


End of Report

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Rihcard Butler

Report No: A15044-5
Issue No 01

LABORATORY TEST REPORT

Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-5	Date samples received	13/12/2023
Your Ref	26555	Date written instructions received	13/12/2023
Purchase Order	26555	Date testing commenced	08/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	1	Determination of Water Content	Yes
	1	Bulk Density	Yes
	1	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 22/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  22/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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Offices in Airdrie, Birmingham and Aston Clinton

Head Office : Whistleberry Road, Hamilton, Glasgow, Scotland, ML3 0HP



Site LT520 BRACO WEST SUBSTATION

Contract No	26555
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Client	SHE Transmission plc
--------	----------------------

Engineer SSE Perth Inveralmond HSE

[illegible]

Notes

Originator

Checked & Approved




TP


CD
22/01/2024

Determination of the Water Content

BS EN ISO 17892-1:2014



				Site LT520 BRACO WEST SUBSTATION		Contract No 26555			
				Client SHE Transmission plc					
				Engineer SSE Perth Inveralmond HSE					
Sample Identification					Lab Sample ID	Non Engineering Description	Bulk Density Mg/m³	Dry Density Mg/m³	Water Content %
Hole ID	Depth m	Sample Ref	Sample Type						
BH02	1.55		B	2012999					
						Brown silty SAND and GRAVEL with organic material. Gravel is fine to coarse	2.11	1.45	45.8
Notes									
Originator	Checked & Approved		BULK DENSITY BS EN ISO 17892-2 Determination of bulk density Linear measurement method				 Sheet 1 of 1		
TP	 22/01/2024								

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH02	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.55 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	98
28.0 mm	96
20.0 mm	94
14.0 mm	88
10.0 mm	76
6.30 mm	65
5.00 mm	60
3.35 mm	59
2.00 mm	56
1.18 mm	53
630 µm	48
425 µm	42
300 µm	33
200 µm	23
150 µm	16
63 µm	12
20 µm	5
6 µm	3
2 µm	2

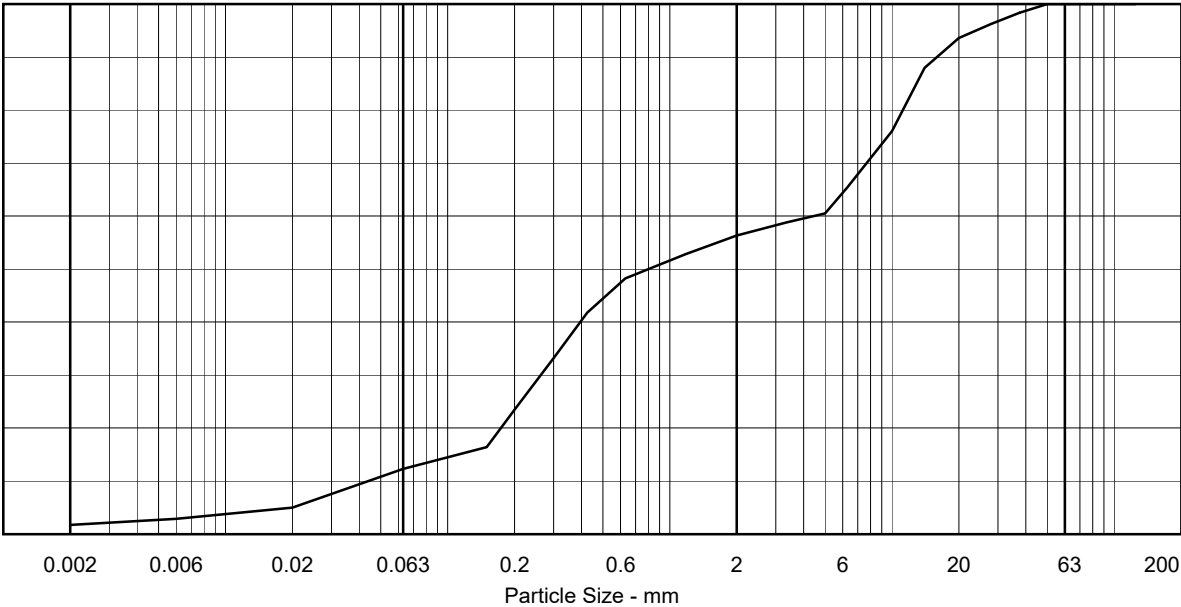
Non Engineering Description	
Brown silty SAND and GRAVEL with organic material. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	43.7
Sand	44.6
Silt	10.0
Clay	1.7
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	50
D60	4.5
D10	0.044
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 102.3	


Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
SM	CD 22/01/2024		


Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-6
Issue No 01

LABORATORY TEST REPORT



Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-6	Date samples received	13/12/2023
Your Ref	26555	Date written instructions received	13/12/2023
Purchase Order	26555	Date testing commenced	18/12/2023
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	2	Determination of Water Content	Yes
	1	Atterberg Limit	Yes
	1	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 19/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  19/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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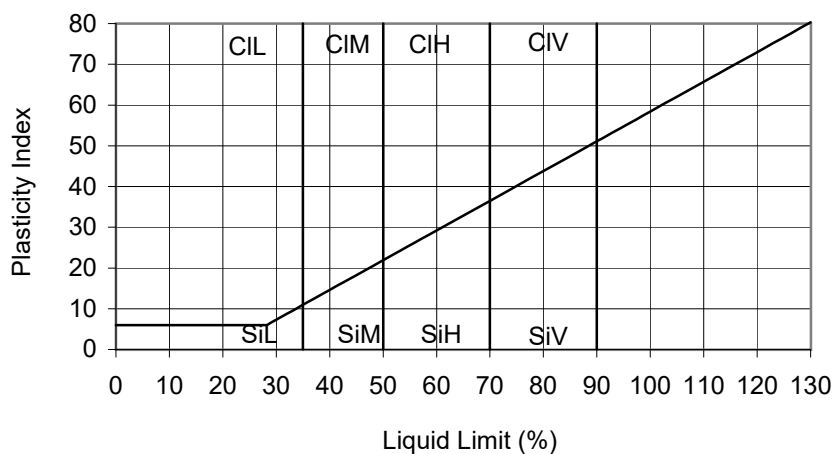
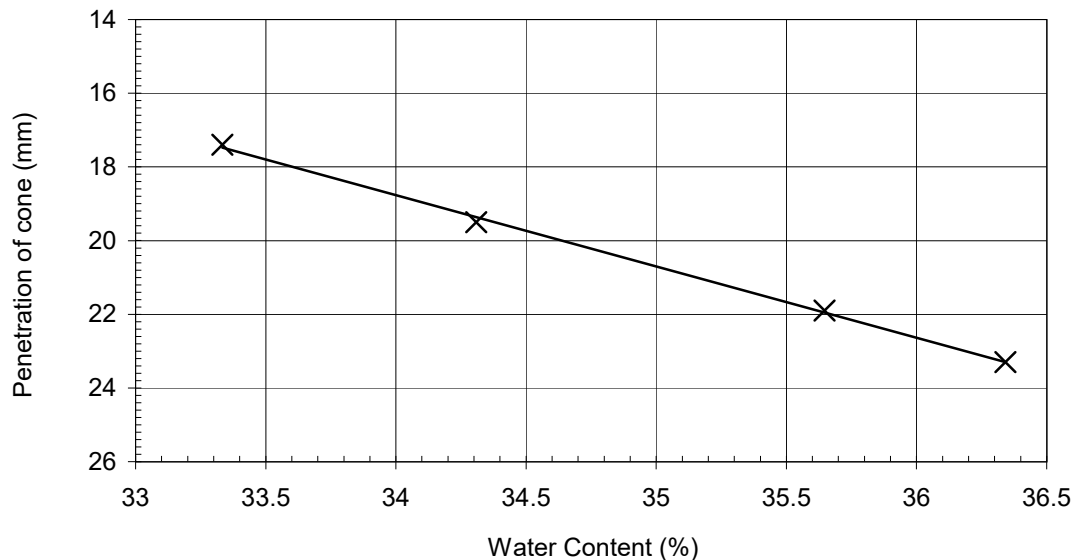
				Site LT520 BRACO WEST SUBSTATION		Contract No 26555		
				Client SHE Transmission plc				
				Engineer SSE Perth Inveralmond HSE				
Sample Identification								
Exploratory Hole	Depth m	Sample Ref	Sample Type					
BH03	1.20		D	2013002	Brown gravelly very silty SAND with organic material. Gravel is fine to coarse	32.5		
BH03	2.00		D	2013003		14.1		
Notes								
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014					
TP	CD 19/01/2024							
								Sheet 1 of 1



Site	LT520 BRACO WEST SUBSTATION	Contract No.	26555
Client	SHE Transmission plc	Hole ID	BH03
Engineer	SSE Perth Inveralmond HSE	Sample Ref	
		Depth (m)	1.20
		Sample Type	D

Non Engineering Description : Brown gravelly very silty SAND with organic material. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving




Sample was determined to be Non-Plastic after preparation
Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 32.5 %
Percentage retained on 425µm sieve : 21 %
Liquid Limit : 35 %
Plastic Limit : Non-Plastic %

Equivalent water content of material passing 425µm sieve : 41.1 %

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	 19/01/2024		

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH03	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 2.00 Sample Type B	

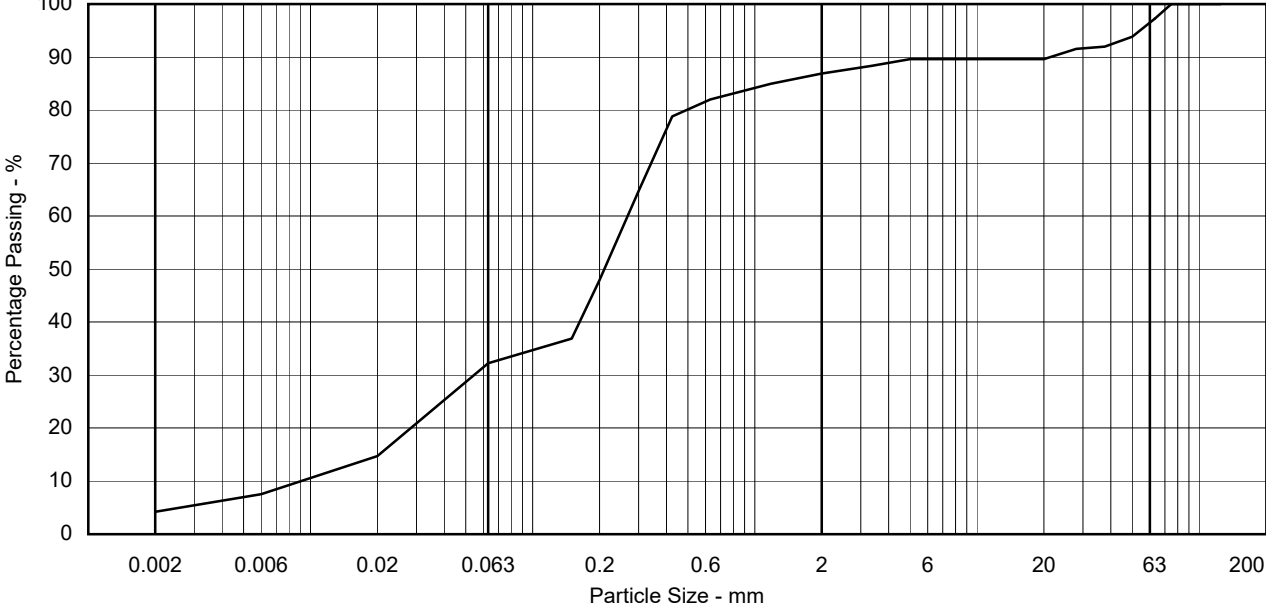
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	97
50.0 mm	94
37.5 mm	92
28.0 mm	92
20.0 mm	90
14.0 mm	90
10.0 mm	90
6.30 mm	90
5.00 mm	90
3.35 mm	88
2.00 mm	87
1.18 mm	85
630 µm	82
425 µm	79
300 µm	65
200 µm	48
150 µm	37
63 µm	32
20 µm	15
6 µm	7
2 µm	4


Non Engineering Description	
Brown gravelly very silty SAND with cobbles. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	2.8
Gravel	10.3
Sand	55.9
Silt	26.8
Clay	4.2
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	75
D60	0.27
D10	0.0091
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 29.7	

Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 19/01/2024		


Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-7
Issue No 01

LABORATORY TEST REPORT



Project Name		LT520 BRACO WEST SUBSTATION	
Project Number		A15044-7	Date samples received 13/12/2023
Your Ref		26555	Date written instructions received 13/12/2023
Purchase Order		26555	Date testing commenced 18/12/2023
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	3	Determination of Water Content	Yes
	3	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 19/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories : C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)		 19/01/2024	
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			




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Head Office : Whistleberry Road, Hamilton, Glasgow, Scotland, ML3 0HP

				SiteLT520 BRACO WEST SUBSTATION		Contract No26555		
				ClientSHE Transmission plc				
				EngineerSSE Perth Inveralmond HSE				
Sample Identification					Non Engineering Description	Water Content %		
Exploratory Hole	Depth m	Sample Ref	Sample Type			Lab Sample ID		
BH04	1.00		D			2013005	Brown slightly gravelly sandy SILT. Gravel is fine to coarse	25.9
BH04	1.20		D			2013007	Brown silty SAND and GRAVEL. Gravel is fine to coarse	12.2
BH04	2.00		D			2013009	Brown silty very gravelly SAND with cobbles. Gravel is fine to coarse	12.9
Notes								
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014					
TP	CD 19/01/2024							
Sheet 1 of 1								

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH04	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.00 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	99
20.0 mm	98
14.0 mm	94
10.0 mm	92
6.30 mm	89
5.00 mm	87
3.35 mm	84
2.00 mm	80
1.18 mm	75
630 µm	69
425 µm	61
300 µm	55
200 µm	50
150 µm	45
63 µm	41
20 µm	30
6 µm	13
2 µm	7

Non Engineering Description

Brown slightly gravelly sandy SILT. Gravel is fine to coarse

Sample Proportions - %

Cobbles	0.0
Gravel	19.9
Sand	39.7
Silt	33.6
Clay	6.8

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	38
D60	0.39
D10	0.0035

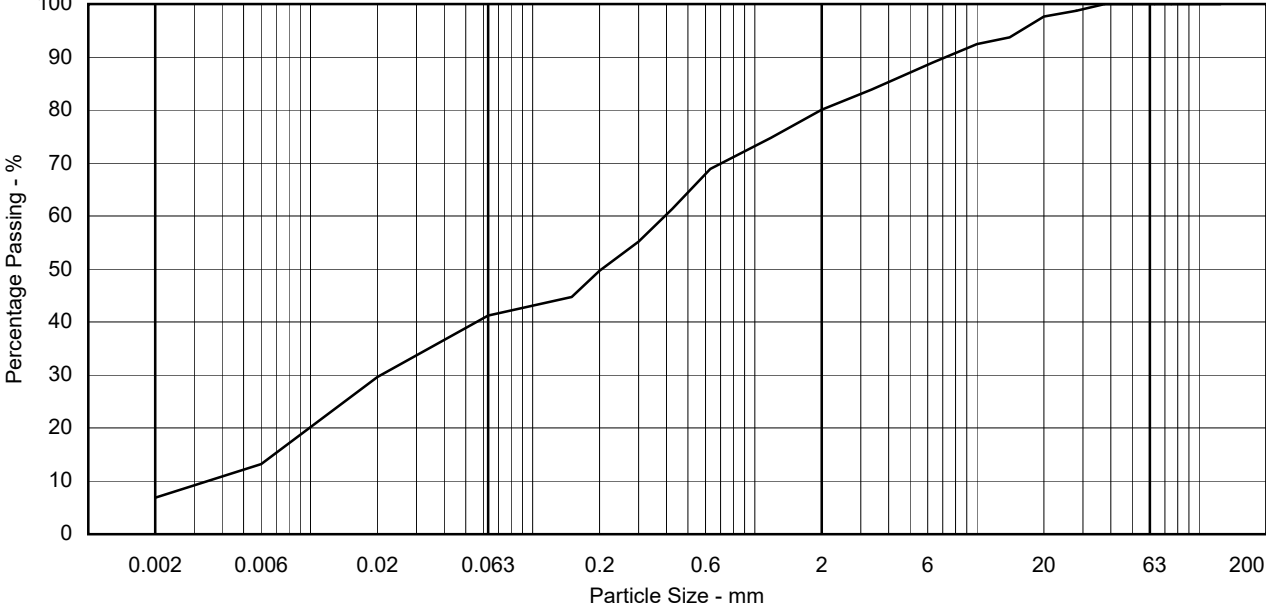
Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)111.4

Notes


Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	<div><div>PARTICLE SIZE DISTRIBUTION</div><div>BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method</div></div>	
RF	<div>CD</div> <div>19/01/2024</div>		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH04	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.20 Sample Type B	

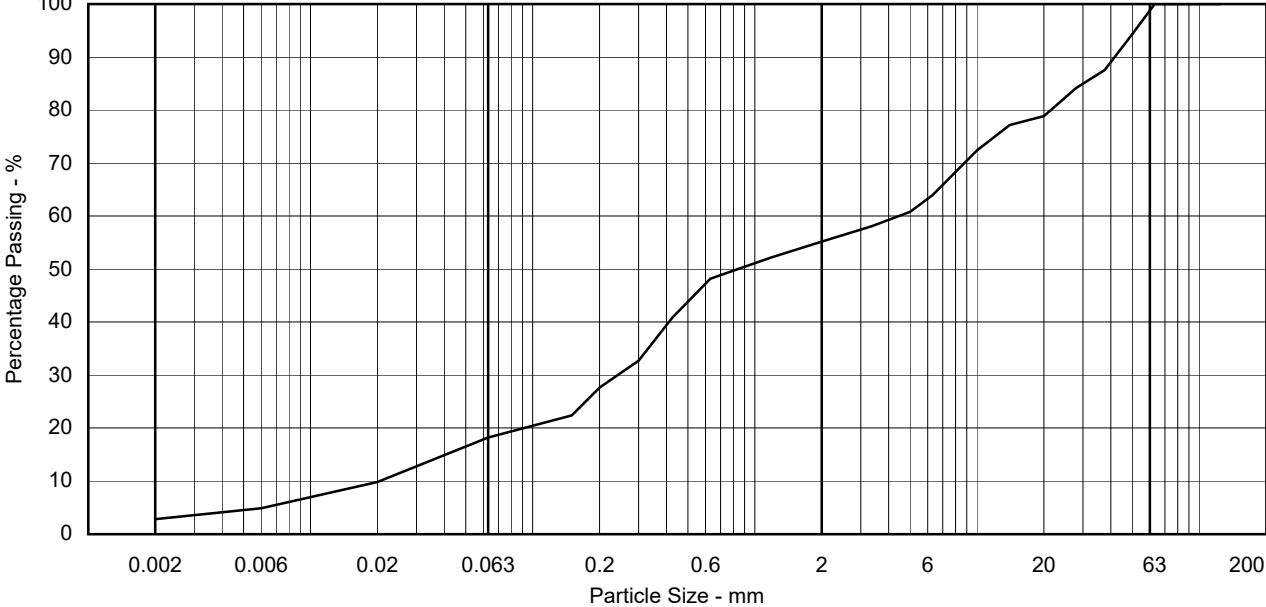
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	94
37.5 mm	88
28.0 mm	84
20.0 mm	79
14.0 mm	77
10.0 mm	72
6.30 mm	64
5.00 mm	61
3.35 mm	58
2.00 mm	55
1.18 mm	52
630 µm	48
425 µm	41
300 µm	33
200 µm	28
150 µm	22
63 µm	18
20 µm	10
6 µm	5
2 µm	3


Non Engineering Description	
Brown silty SAND and GRAVEL. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	44.8
Sand	37.6
Silt	14.8
Clay	2.8
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	4.5
D10	0.021
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 214.3	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 19/01/2024		

Sheet 1 of 1



SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleBH04

Sample Ref

Depth (m)2.00

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	97
50.0 mm	95
37.5 mm	88
28.0 mm	86
20.0 mm	82
14.0 mm	82
10.0 mm	80
6.30 mm	76
5.00 mm	74
3.35 mm	71
2.00 mm	67
1.18 mm	62
630 µm	56
425 µm	49
300 µm	40
200 µm	28
150 µm	25
63 µm	22
20 µm	7
6 µm	3
2 µm	2

Non Engineering Description

Brown silty very gravelly SAND with cobbles. Gravel is fine to coarse

Sample Proportions - %

Cobbles	3.5
Gravel	29.8
Sand	46.2
Silt	18.4
Clay	2.2

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	75
D60	0.97
D10	0.025

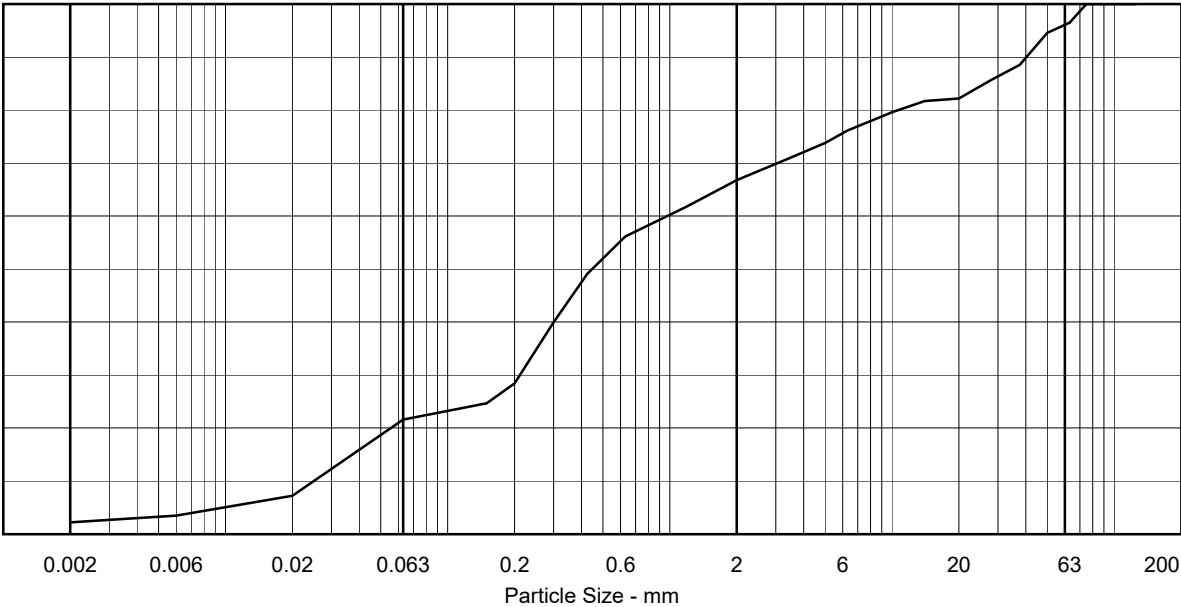
Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)38.8

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator

Checked & Approved

RF


CD

19/01/2024

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-8
Issue No 01

LABORATORY TEST REPORT



Project Name		LT520 BRACO WEST SUBSTATION	
Project Number		A15044-8	Date samples received 13/12/2023
Your Ref		26555	Date written instructions received 14/12/2023
Purchase Order		26555	Date testing commenced 08/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	3	Determination of Water Content	Yes
	1	Atterberg Limit	Yes
	3	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 22/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories : C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)		 22/01/2024	
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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				Site LT520 BRACO WEST SUBSTATION		Contract No 26555			
				Client SHE Transmission plc					
				Engineer SSE Perth Inveralmond HSE					
Sample Identification					Non Engineering Description	Water Content %			
Exploratory Hole	Depth m	Sample Ref	Sample Type				Lab Sample ID		
BH05	1.00		D				2013011	Brown silty very gravelly SAND with rootlets. Gravel is fine to coarse	28.2
BH05	1.20		D				2013014	Brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse	20.0
BH05	2.00		D				2013015	Brown very silty SAND and GRAVEL. Gravel is fine to coarse	18.2
Notes									
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014						
TP	CD 22/01/2024								
						Sheet 1 of 1			



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No. 26555

Hole ID BH05

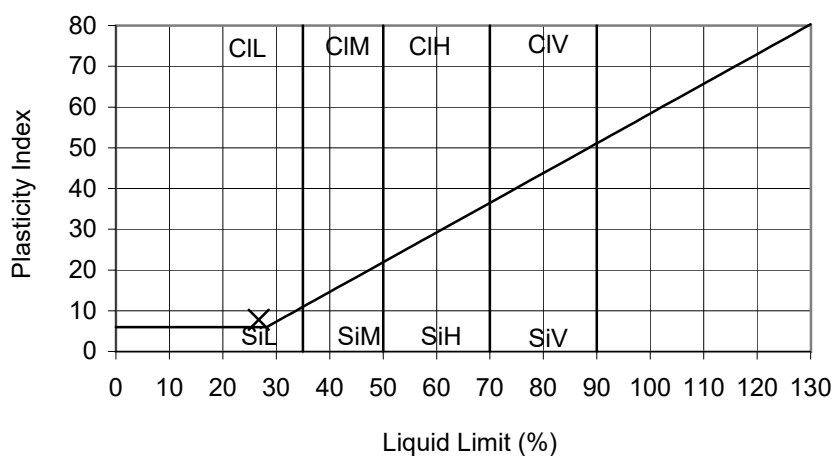
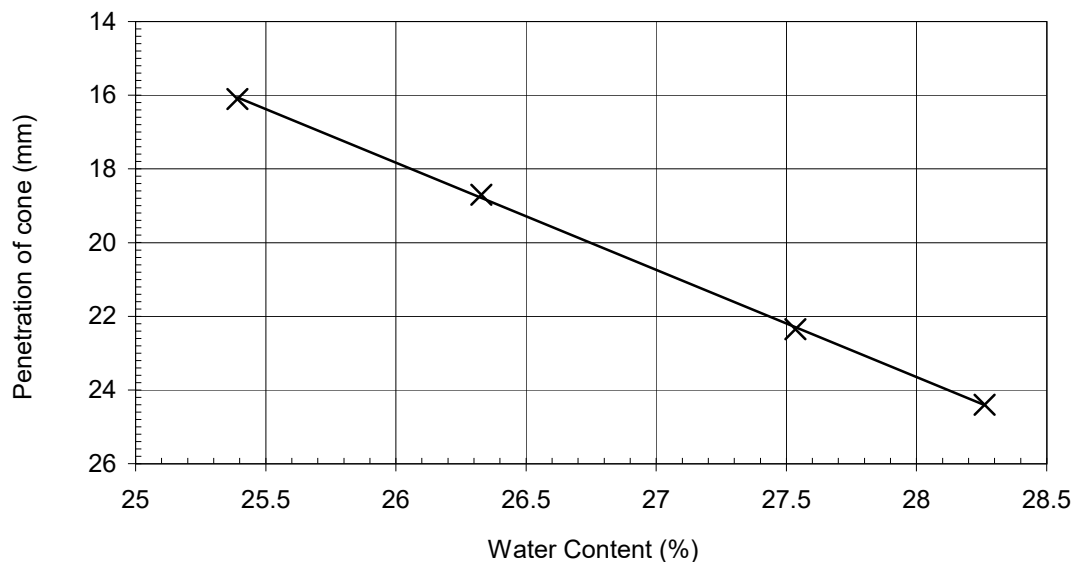
Sample Ref

Depth (m) 1.20

Sample Type D

Non Engineering Description : Brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Liquid Limit was determined by mixing using increasing water content and 30° cone


Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 20.0 %
 Percentage retained on 425µm sieve : 45 %
 Liquid Limit : 27 %
 Plastic Limit : 19 %
 Plasticity Index : 8.0

Equivalent water content of material passing 425µm sieve : 36.4 %

Liquidity Index : 2.18

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	CD 22/01/2024		

	SiteLT520 BRACO WEST SUBSTATION		Contract No26555	
	ClientSHE Transmission plc		HoleBH05	
	EngineerSSE Perth Inveralmond HSE		Sample Ref Depth (m)1.00 Sample TypeB	

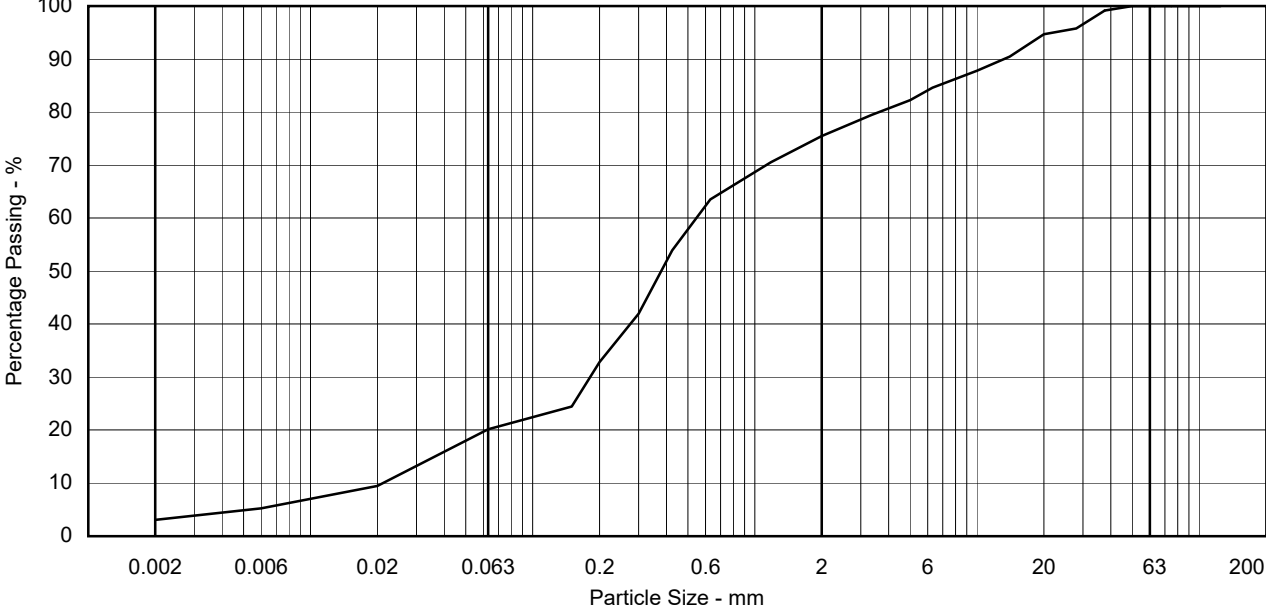
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	99
28.0 mm	96
20.0 mm	95
14.0 mm	90
10.0 mm	88
6.30 mm	85
5.00 mm	82
3.35 mm	79
2.00 mm	75
1.18 mm	71
630 µm	63
425 µm	54
300 µm	42
200 µm	33
150 µm	24
63 µm	20
20 µm	9
6 µm	5
2 µm	3


Non Engineering Description	
Brown silty very gravelly SAND with rootlets. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	24.5
Sand	56.1
Silt	16.4
Clay	3.0
Particle Density - Assumed (Mg/m3)2.65	
Particle Diameter - mm	
D100	50
D60	0.55
D10	0.021
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5)26.2	


Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 22/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH05	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.20 Sample Type B	

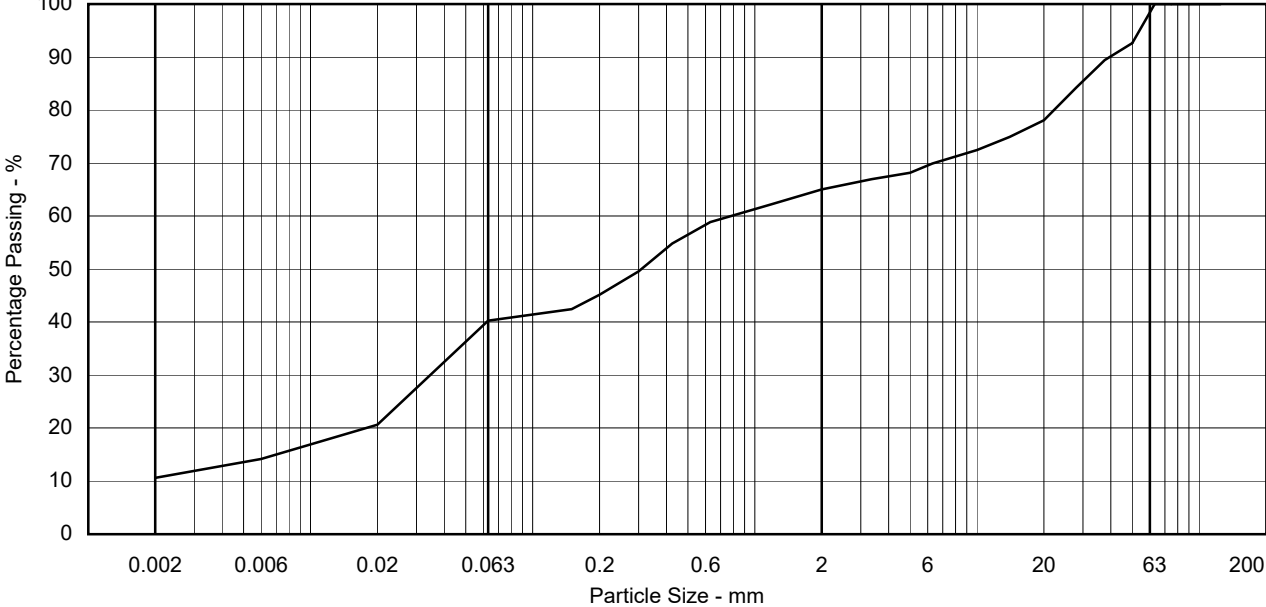
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	93
37.5 mm	89
28.0 mm	84
20.0 mm	78
14.0 mm	75
10.0 mm	72
6.30 mm	70
5.00 mm	68
3.35 mm	67
2.00 mm	65
1.18 mm	62
630 µm	59
425 µm	55
300 µm	50
200 µm	45
150 µm	42
63 µm	40
20 µm	21
6 µm	14
2 µm	11


Non Engineering Description	
Brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	35.0
Sand	26.1
Silt	28.3
Clay	10.6
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	0.78
D10	
Uniformity Coefficient <small>(SHW series 600, Table 6/1, footnote 5)</small>	N/A


Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
JM	CD 22/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH05	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.90 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	84
37.5 mm	77
28.0 mm	70
20.0 mm	64
14.0 mm	62
10.0 mm	59
6.30 mm	56
5.00 mm	54
3.35 mm	53
2.00 mm	51
1.18 mm	48
630 µm	45
425 µm	40
300 µm	35
200 µm	29
150 µm	25
63 µm	23
20 µm	15
6 µm	10
2 µm	4

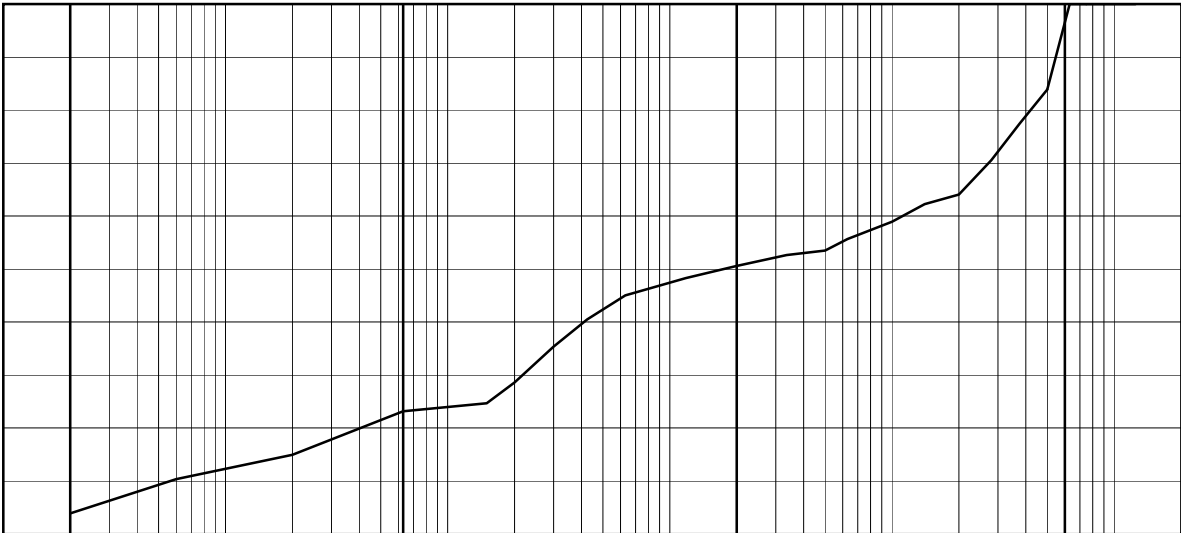
Non Engineering Description	
Brown silty very sandy fine to coarse GRAVEL. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	49.4
Sand	28.0
Silt	18.7
Clay	3.9
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	11
D10	0.0057
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 1929.8	


Notes
Sample does not comply with BS EN ISO 17892-4 minimum mass requirements Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
JM	CD 22/01/2024		


Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-9
Issue No 01

LABORATORY TEST REPORT



Project Name		LT520 BRACO WEST SUBSTATION	
Project Number		A15044-9	Date samples received 14/12/2023
Your Ref		26555	Date written instructions received 14/12/2023
Purchase Order		26555	Date testing commenced 08/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	2	Determination of Water Content	Yes
	2	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 19/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories : C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)		 19/01/2024	
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			




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Head Office : Whistleberry Road, Hamilton, Glasgow, Scotland, ML3 0HP

				Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
				Client SHE Transmission plc			
				Engineer SSE Perth Inveralmond HSE			
Sample Identification							
Exploratory Hole	Depth m	Sample Ref	Sample Type				
BH07	1.20		D	2013019	Brown silty very sandy fine to coarse GRAVEL	7.1	
BH07	2.00		D	2013018	Brown silty SAND and GRAVEL. Gravel is fine to coarse	8.4	
Notes							
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014				
TP	CD 19/01/2024						
						Sheet 1 of 1	



SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleBH07

Sample Ref

Depth (m)1.20

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	95
63.0 mm	90
50.0 mm	81
37.5 mm	76
28.0 mm	67
20.0 mm	60
14.0 mm	60
10.0 mm	56
6.30 mm	53
5.00 mm	50
3.35 mm	47
2.00 mm	43
1.18 mm	39
630 µm	34
425 µm	28
300 µm	22
200 µm	18
150 µm	13
63 µm	13
20 µm	6
6 µm	3
2 µm	2

Non Engineering Description

Brown silty very sandy fine to coarse GRAVEL with cobbles

Sample Proportions - %

Cobbles	10.2
Gravel	46.3
Sand	31.3
Silt	10.6
Clay	1.5

Particle Density - Assumed (Mg/m3)2.65

Particle Diameter - mm

D100	90
D60	14
D10	0.040

Uniformity Coefficient
(SHW series 600, Table 6/1, footnote 5)350.0

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %

Particle Size - mm

Originator

Checked & Approved


RF

CD
19/01/2024


PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method

BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method



Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH07	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 2.00 Sample Type B	


Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	97
50.0 mm	90
37.5 mm	83
28.0 mm	77
20.0 mm	69
14.0 mm	68
10.0 mm	65
6.30 mm	60
5.00 mm	57
3.35 mm	54
2.00 mm	50
1.18 mm	46
630 µm	41
425 µm	36
300 µm	30
200 µm	23
150 µm	15
63 µm	11
20 µm	5
6 µm	2
2 µm	1

Non Engineering Description	
Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	3.0
Gravel	46.7
Sand	39.3
Silt	9.9
Clay	1.1
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	75
D60	6.3
D10	0.048
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 131.3	

Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 19/01/2024		


Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-10
Issue No 01

LABORATORY TEST REPORT

Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-10	Date samples received	14/12/2023
Your Ref	26555	Date written instructions received	14/12/2023
Purchase Order	26555	Date testing commenced	09/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	1	Determination of Water Content	Yes
	1	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 19/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  19/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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Site LT520 BRACO WEST SUBSTATION

Contract No	26555
-------------	--------------

Client	SHE Transmission plc
--------	----------------------

Engineer SSE Perth Inveralmond HSE

[illegible]

Notes

Originator

Checked &
Approved


TP

CD
19/01/2024

Determination of the Water Content

BS EN ISO 17892-1:2014



	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH08	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 0.90 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	98
28.0 mm	95
20.0 mm	93
14.0 mm	89
10.0 mm	86
6.30 mm	81
5.00 mm	78
3.35 mm	74
2.00 mm	68
1.18 mm	62
630 µm	57
425 µm	50
300 µm	43
200 µm	35
150 µm	26
63 µm	20
20 µm	7
6 µm	6
2 µm	4

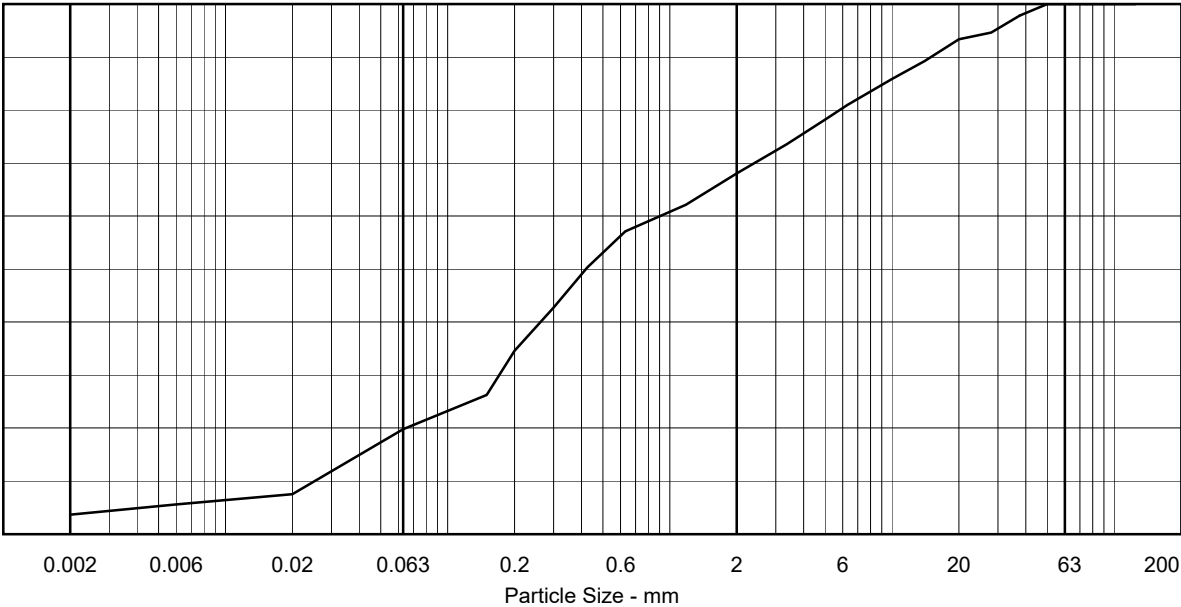
Non Engineering Description	
Brown silty very gravelly SAND with pockets of clay and rootlets. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	32.0
Sand	49.1
Silt	15.3
Clay	3.6
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	50
D60	0.90
D10	0.025
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 36.0	


Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
SM	CD 19/01/2024		


Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-11
Issue No 01

LABORATORY TEST REPORT

Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-11	Date samples received	13/12/2023
Your Ref	26555	Date written instructions received	14/12/2023
Purchase Order	26555	Date testing commenced	09/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	2	Determination of Water Content	Yes
	2	Particle Size Distribution	Yes
	2	Chemical Analysis	s/c - Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 22/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  22/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			




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<div></div>				SiteLT520 BRACO WEST SUBSTATION		Contract No26555	
				ClientSHE Transmission plc			
				EngineerSSE Perth Inveralmond HSE			
Sample Identification							
Exploratory Hole	Depth m	Sample Ref	Sample Type				
BH09	1.00		D	2013021	Brown slightly gravelly sandy CLAY. Gravel is fine to coarse	24.4	
BH09	2.00		D	2013023	Brown silty SAND and GRAVEL. Gravel is fine to coarse	9.9	
Notes							
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014				
TP	<div>CD22/01/2024</div>						
						Sheet 1 of 1	

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH09	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.00 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	97
37.5 mm	95
28.0 mm	93
20.0 mm	91
14.0 mm	86
10.0 mm	84
6.30 mm	78
5.00 mm	77
3.35 mm	73
2.00 mm	70
1.18 mm	64
630 µm	57
425 µm	49
300 µm	43
200 µm	38
150 µm	34
63 µm	33
20 µm	20
6 µm	14
2 µm	8

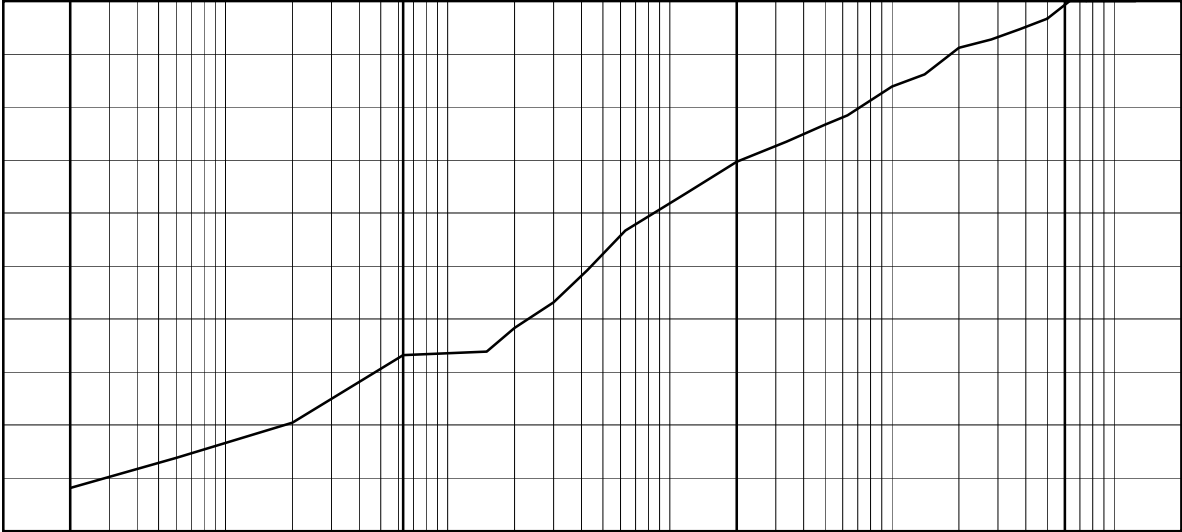
Non Engineering Description	
Brown slightly gravelly sandy CLAY. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	30.3
Sand	37.4
Silt	24.2
Clay	8.1
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	0.85
D10	0.0029
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 293.1	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 22/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH09	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 2.00 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	92
37.5 mm	89
28.0 mm	86
20.0 mm	78
14.0 mm	75
10.0 mm	72
6.30 mm	69
5.00 mm	66
3.35 mm	62
2.00 mm	59
1.18 mm	55
630 µm	49
425 µm	42
300 µm	34
200 µm	29
150 µm	24
63 µm	20
20 µm	10
6 µm	7
2 µm	3

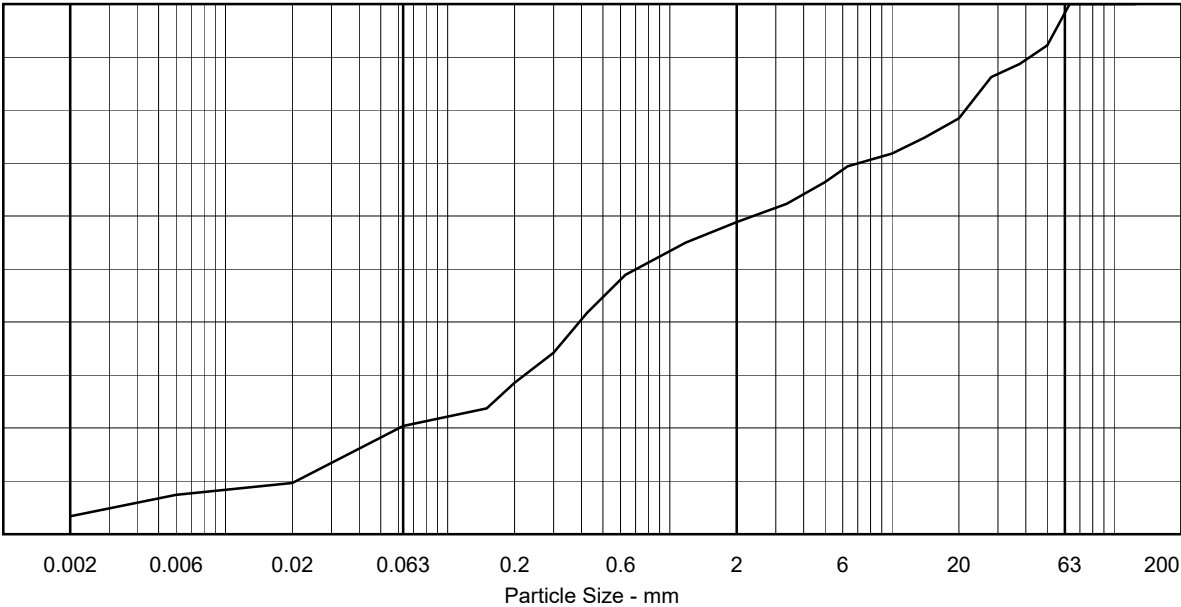
Non Engineering Description	
Brown silty SAND and GRAVEL. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	41.1
Sand	39.2
Silt	16.3
Clay	3.3
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	63
D60	2.4
D10	0.021
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 114.3	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
JM	CD 22/01/2024		

Sheet 1 of 1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-29979

Client Ref A15044-11

Contract Title

Lab No	2280107	2280108
Sample ID	BH09	BH09
Depth	1.00	2.00
Other ID	2013021	2013023
Sample Type	SOIL	SOIL
Sampling Date	23/11/2023	23/01/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Inorganics					
pH	DETSC 2008#		pH	7.0	7.8
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l	210	92

Information in Support of the Analytical Results

Our Ref 23-29979
Client Ref A15044-11
Contract

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2280107	BH09 1.00 SOIL	23/11/23		PT 500ml x2	pH + Conductivity (7 days)	
2280108	BH09 2.00 SOIL	23/01/23		PT 500ml x2	Anions 2:1 (30 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-12
Issue No 01

LABORATORY TEST REPORT

Project Name		LT520 BRACO WEST SUBSTATION	
Project Number		A15044-12	Date samples received 13/12/2023
Your Ref		26555	Date written instructions received 13/12/2023
Purchase Order		26555	Date testing commenced 08/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	2	Determination of Water Content	Yes
	2	Atterberg Limit	Yes
	2	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 19/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories : CD 19/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			





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Version 026 - 01/09/2023
1212 - Moisture Content Table - A15044-12.xls

62 Rochsolloch Road, Airdrie, ML6 9BG
Lab Project No A15044-12 : 19/01/2024 14:51:30

				Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
				Client SHE Transmission plc			
				Engineer SSE Perth Inveralmond HSE			
Sample Identification							
Exploratory Hole	Depth m	Sample Ref	Sample Type				
BH13	2.00		D	2013027	Brown clayey SAND and GRAVEL. Gravel is fine to coarse	22.5	
BH13	2.70		D	2013025	Brown clayey SAND and GRAVEL. Gravel is fine to coarse	13.9	
Notes							
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014				
TP	CD 19/01/2024						
						Sheet 1 of 1	



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No. 26555

Hole ID BH13

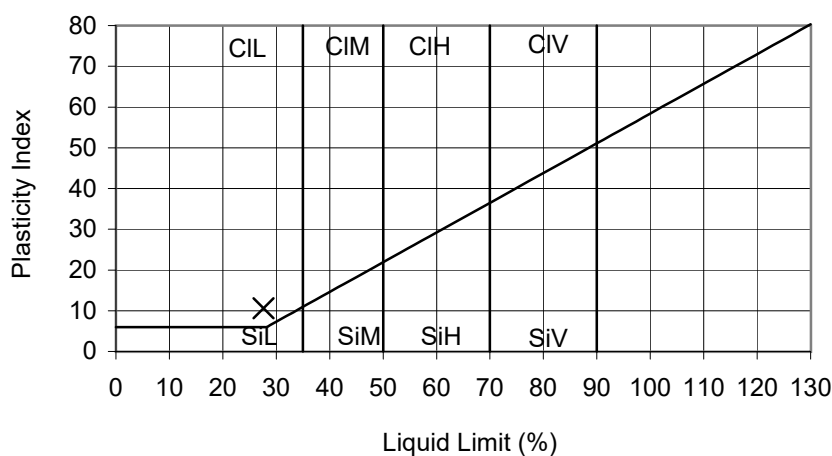
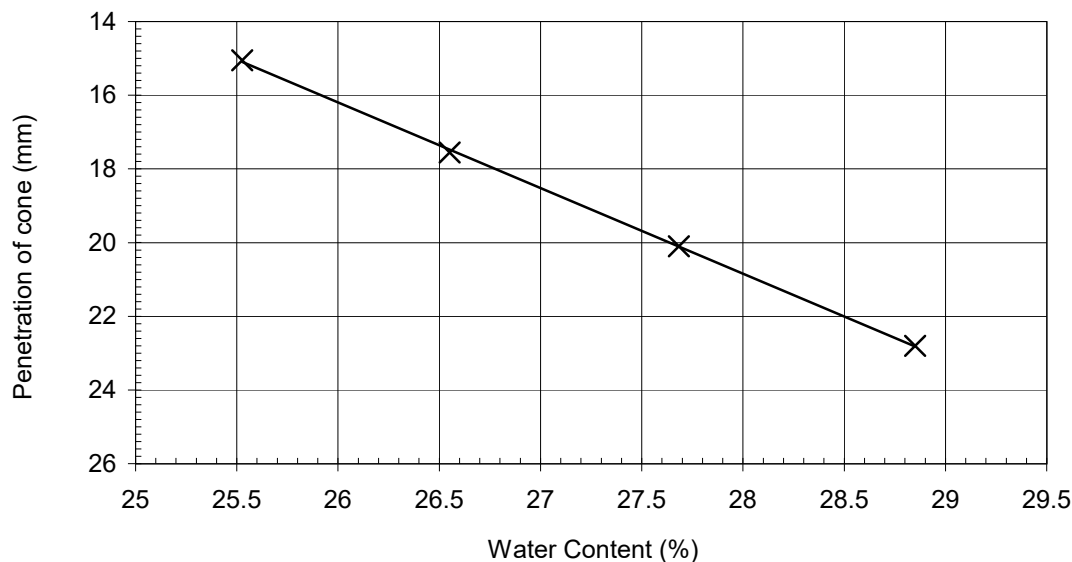
Sample Ref

Depth (m) 2.00

Sample Type D

Non Engineering Description : Brown clayey SAND and GRAVEL. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving



Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014) 22.5 %
 Percentage retained on 425µm sieve : 46 %
 Liquid Limit : 28 %
 Plastic Limit : 17 %
 Plasticity Index : 11

Equivalent water content of material passing 425µm sieve : 41.7 %

Liquidity Index : 2.25

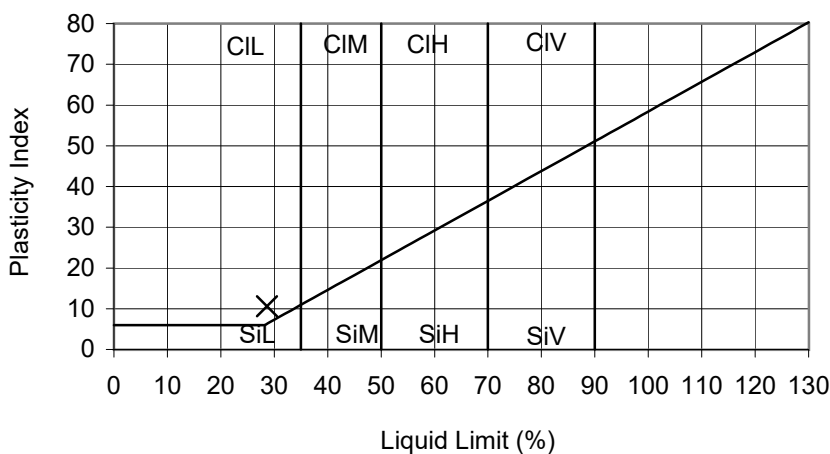
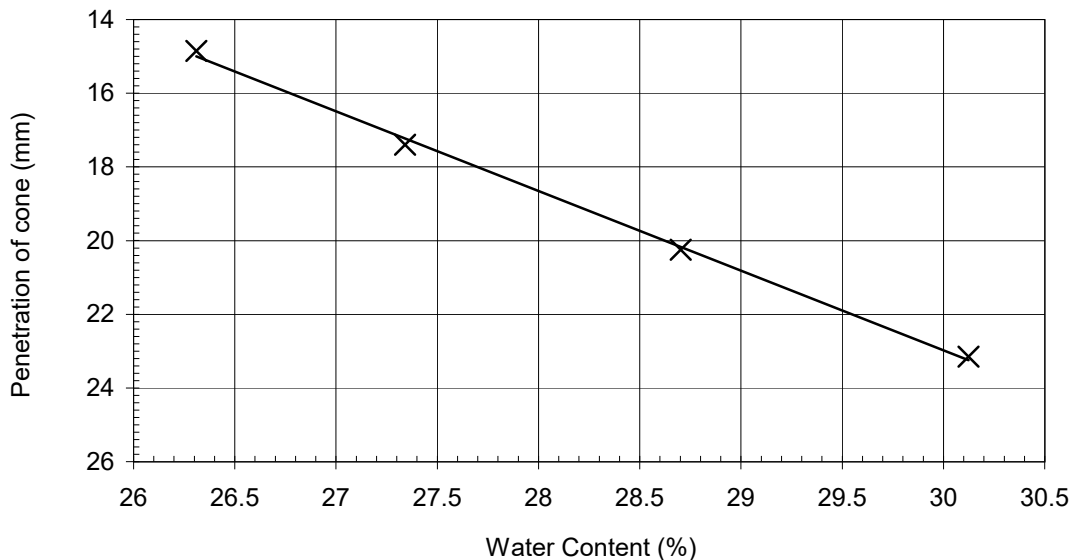
Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	 19/01/2024		



Site	LT520 BRACO WEST SUBSTATION	Contract No.	26555
Client	SHE Transmission plc	Hole ID	BH13
Engineer	SSE Perth Inveralmond HSE	Sample Ref	
		Depth (m)	2.70
		Sample Type	D

Non Engineering Description : Brown clayey SAND and GRAVEL. Gravel is fine to coarse

Preparation : Sample oven dried, Percentage retained on 425µm sieve measured by wet sieving




Liquid Limit was determined by mixing using increasing water content and 30° cone

Results :

As Received Water Content : (BS EN ISO 17892-1:2014)	13.9 %
Percentage retained on 425µm sieve :	62 %
Liquid Limit :	29 %
Plastic Limit :	18 %
Plasticity Index :	11
Equivalent water content of material passing 425µm sieve :	36.6 %
Liquidity Index :	1.69

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	
NW	 19/01/2024		

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH13	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 2.00 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	95
28.0 mm	92
20.0 mm	89
14.0 mm	88
10.0 mm	84
6.30 mm	77
5.00 mm	74
3.35 mm	72
2.00 mm	69
1.18 mm	65
630 µm	60
425 µm	54
300 µm	48
200 µm	40
150 µm	34
63 µm	30
20 µm	19
6 µm	11
2 µm	6

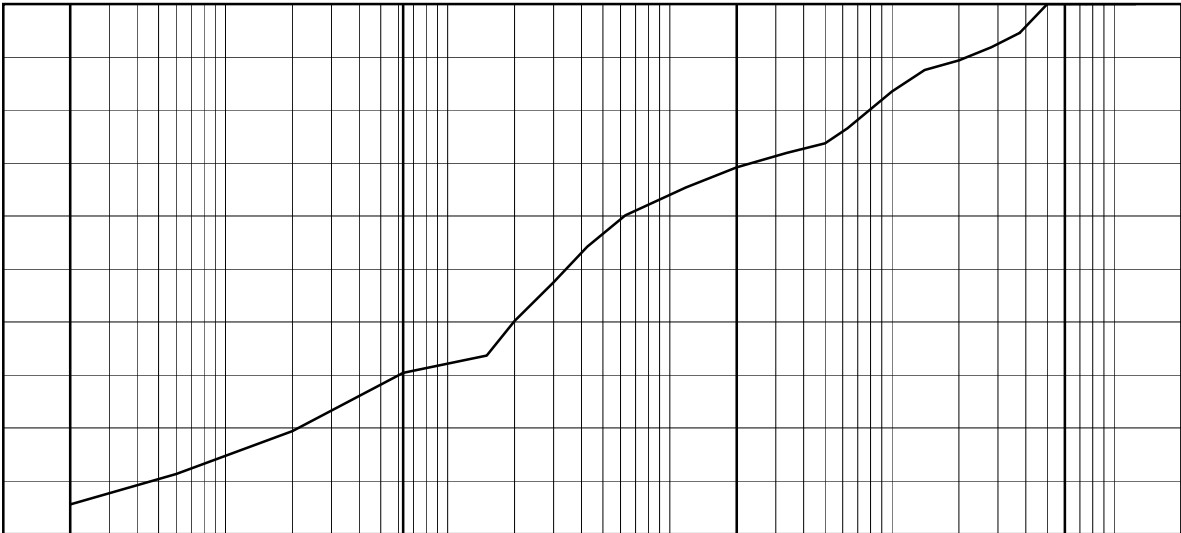
Non Engineering Description	
Brown clayey SAND and GRAVEL. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	30.8
Sand	39.5
Silt	24.1
Clay	5.5
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	50
D60	0.62
D10	0.0047
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 131.9	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			


Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 19/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH13	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 2.70 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	90
50.0 mm	90
37.5 mm	88
28.0 mm	84
20.0 mm	82
14.0 mm	79
10.0 mm	76
6.30 mm	68
5.00 mm	64
3.35 mm	63
2.00 mm	61
1.18 mm	57
630 µm	49
425 µm	39
300 µm	34
200 µm	29
150 µm	25
63 µm	23
20 µm	13
6 µm	6
2 µm	4

Non Engineering Description

Brown clayey SAND and GRAVEL with cobbles. Gravel is fine to coarse

Sample Proportions - %

Cobbles	10.0
Gravel	29.5
Sand	38.5
Silt	17.9
Clay	4.0

Particle Density - Assumed (Mg/m3) 2.65

Particle Diameter - mm

D100	75
D60	1.9
D10	0.012

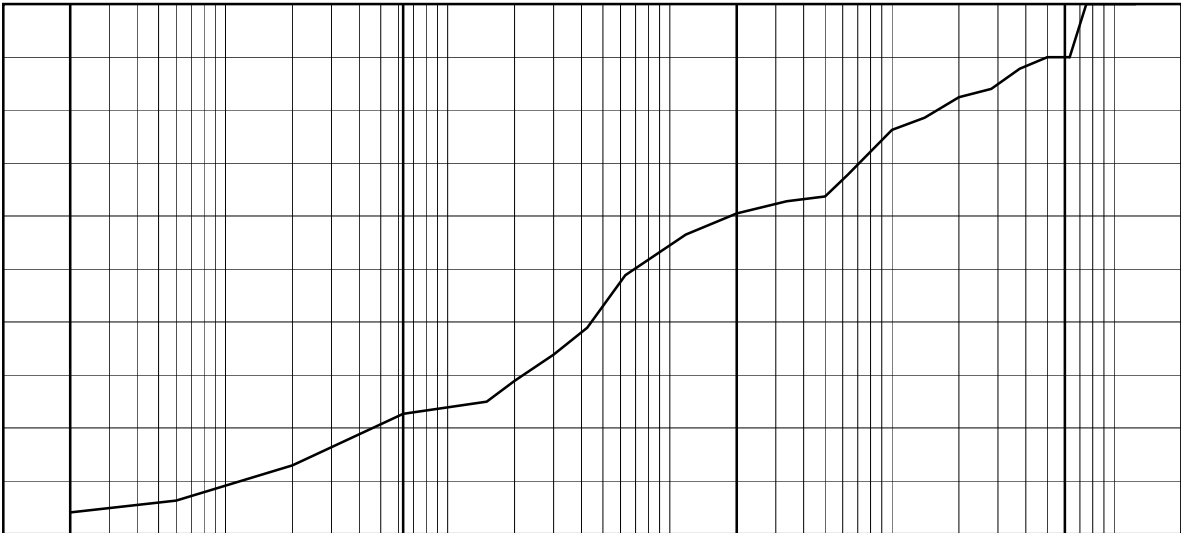
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 158.3

Notes


Sample does not comply with BS EN ISO 17892-4 minimum mass requirements
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	<div><div>PARTICLE SIZE DISTRIBUTION</div><div>BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method</div></div>	
RF	<div>CD</div> <div>19/01/2024</div>		


Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-13
Issue No 01

LABORATORY TEST REPORT

Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-13	Date samples received	13/12/2023
Your Ref	26555	Date written instructions received	15/12/2023
Purchase Order	26555	Date testing commenced	09/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	1	Determination of Water Content	Yes
	1	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 19/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  19/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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Site LT520 BRACO WEST SUBSTATION

Client	SHE Transmission plc
--------	----------------------

Engineer SSE Perth Inveralmond HSE

Contract No	26555
-------------	--------------

[illegible]

Notes

Originator

Checked &
Approved

TP

CD
19/01/2024

Determination of the Water Content



Sheet 1 of 1



Site LT520 BRACO WEST SUBSTATION

Client	SHE Transmission plc
--------	----------------------

Engineer SSE Perth Inveralmond HSE

Contract No	26555
-------------	-------

Hole BH19

Sample Ref

Depth (m)	0.50
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Sample Type	B
-------------	---

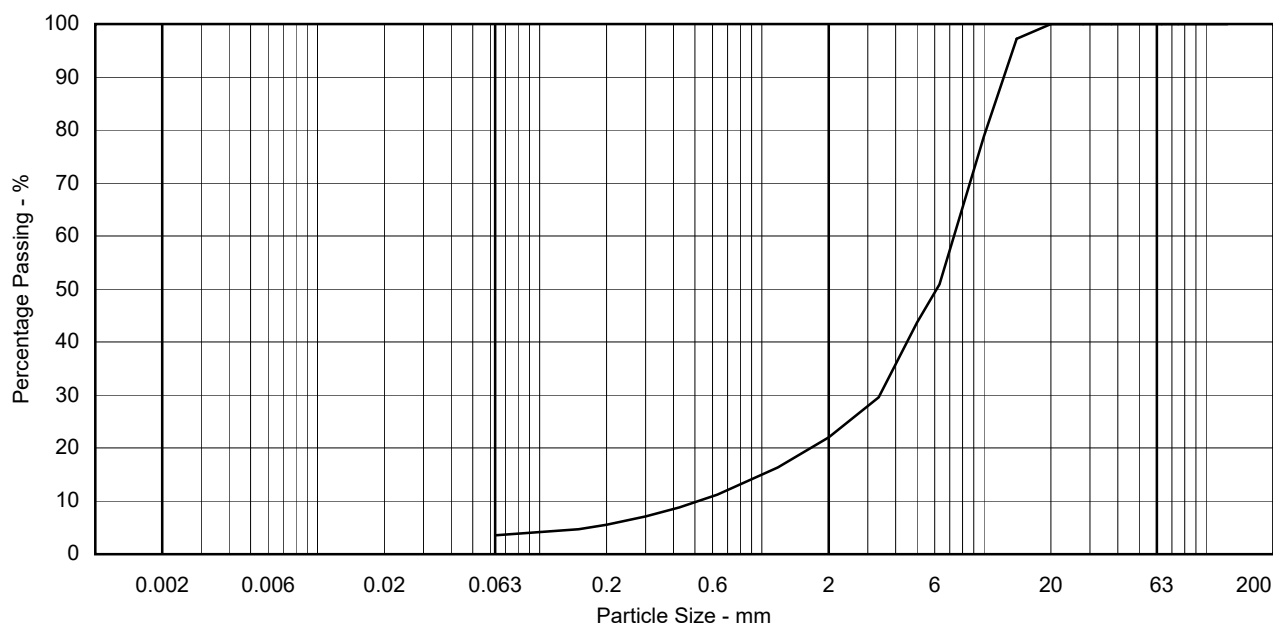
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	97
10.0 mm	79
6.30 mm	51
5.00 mm	44
3.35 mm	30
2.00 mm	22
1.18 mm	16
630 µm	11
425 µm	9
300 µm	7
200 µm	5
150 µm	5
63 µm	4

Non Engineering Description
Dark brown slightly silty sandy fine to medium gravel with inclusions of fibrous peat

Sample Proportions - %	
Cobbles	0.0
Gravel	78.0
Sand	18.4
Silt & Clay	3.5
Particle Density - Assumed (Mg/m ³)	2.65
Particle Diameter - mm	
D100	20
D60	7.3
D10	0.52
Uniformity Coefficient	14.0

Notes

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved	<div>PARTICLE SIZE DISTRIBUTION</div> <div>BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method</div>	<div></div>
JM	<div></div> <div>19/01/2024</div>		

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-16
Issue No 01

LABORATORY TEST REPORT



Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-16	Date samples received	
Your Ref	26555	Date written instructions received	14/12/2023
Purchase Order	26555	Date testing commenced	09/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	2	Determination of Water Content	Yes
	2	Particle Size Distribution	Yes
	1	Chemical Analysis	s/c - Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 19/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories : C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			




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				Site LT520 BRACO WEST SUBSTATION		Contract No 26555		
				Client SHE Transmission plc				
				Engineer SSE Perth Inveralmond HSE				
Sample Identification								
Exploratory Hole	Depth m	Sample Ref	Sample Type					
BH06	0.60		D	2013093	Brown fibrous PEAT		489	
BH06	1.20		D	2013095	Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse		41.1	
Notes								
Originator	Checked & Approved		Determination of the Water Content BS EN ISO 17892-1:2014					
TP	CD 19/01/2024							
								Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH06	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 0.60 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	99
10.0 mm	97
6.30 mm	93
5.00 mm	91
3.35 mm	91
2.00 mm	90
1.18 mm	88
630 µm	78
425 µm	68
300 µm	56
200 µm	41
150 µm	26
63 µm	13
20 µm	4
6 µm	2
2 µm	1

Non Engineering Description	
Brown fibrous PEAT	

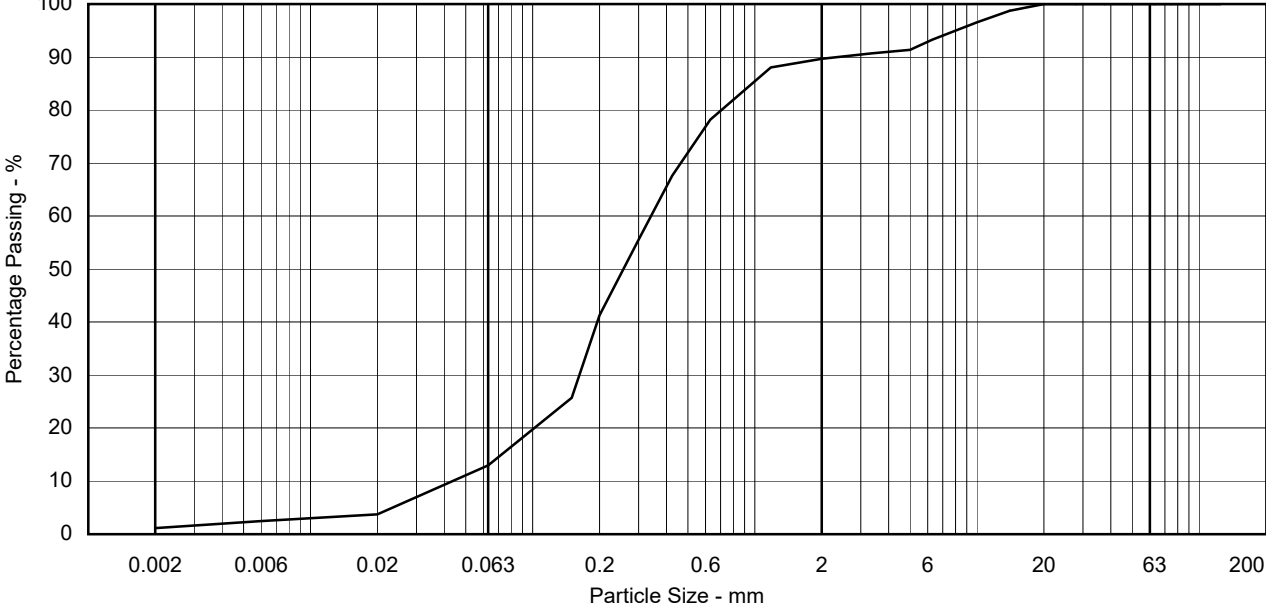
Sample Proportions - %	
Cobbles	0.0
Gravel	10.4
Sand	77.4
Silt	11.2
Clay	1.1


Particle Density - Assumed (Mg/m3)	
2.65	

Particle Diameter - mm	
D100	20
D60	0.34
D10	0.044
Uniformity Coefficient <small>(SHW series 600, Table 6/1, footnote 5)</small>	7.7


Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
JM	CD 19/01/2024		

Sheet 1 of 1

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH06	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 1.20 Sample Type B	

Particle Size	% Passing
125.0 mm	100
90.0 mm	78
75.0 mm	78
63.0 mm	75
50.0 mm	71
37.5 mm	66
28.0 mm	65
20.0 mm	60
14.0 mm	57
10.0 mm	54
6.30 mm	51
5.00 mm	49
3.35 mm	49
2.00 mm	48
1.18 mm	46
630 µm	43
425 µm	39
300 µm	31
200 µm	25
150 µm	21
63 µm	18
20 µm	11
6 µm	4
2 µm	3

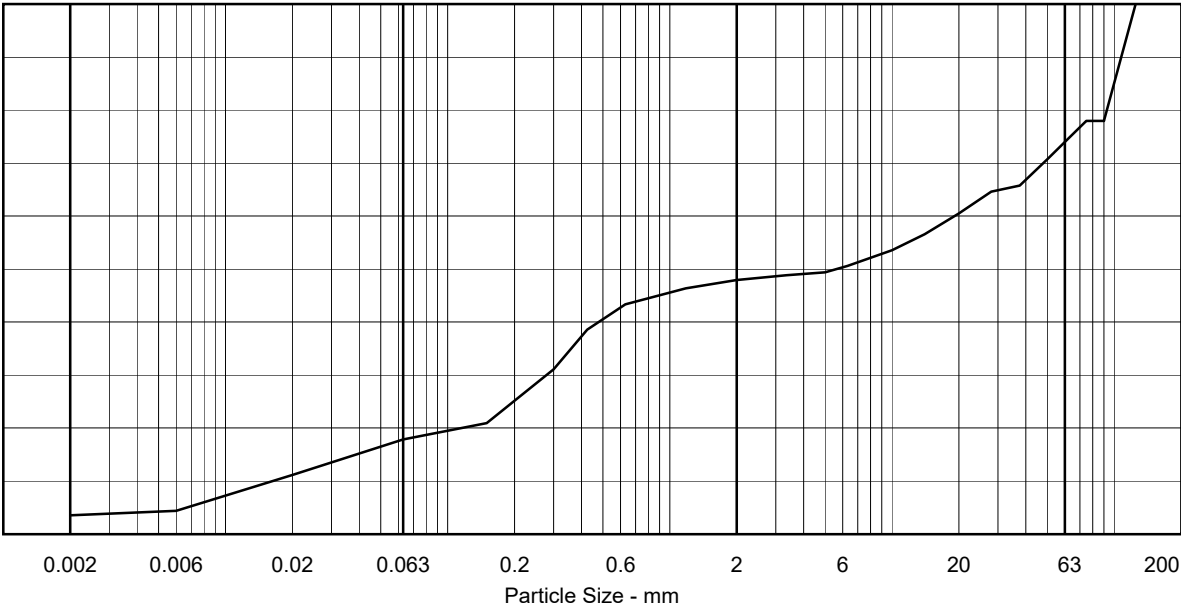
Non Engineering Description	
Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	25.1
Gravel	27.0
Sand	30.6
Silt	13.8
Clay	3.5
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	125
D60	19
D10	0.016
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 1187.5	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
RF	CD 19/01/2024		

Sheet 1 of 1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-29977

Client Ref A15044-16

Contract Title

Lab No	2280105
Sample ID	BH06
Depth	0.60
Other ID	2013093
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units
Inorganics			
pH	DETSC 2008#		pH 3.4
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l 150

Information in Support of the Analytical Results

Our Ref 23-29977
Client Ref A15044-16
Contract

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2280105	BH06 0.60 SOIL		PT 500ml	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report



Site: LT520 BRACO WEST SUBSTATION

Contract No: 26555

Client: SHE Transmission plc

Engineer: SSE Perth Inveralmond HSE

Style: APPENDIX A File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:28:01 Raeburn Drilling and Geotechnical Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

APPENDIX F
GEOTECHNICAL SOIL & ROCK TESTING RESULTS



Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-18
Issue No 01

LABORATORY TEST REPORT

Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-18	Date samples received	13/12/2023
Your Ref	26555	Date written instructions received	14/12/2023
Purchase Order	26555	Date testing commenced	10/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	1	Determination of Water Content	Yes
	1	Bulk Density	Yes
	1	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 22/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories : CD 22/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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Site LT520 BRACO WEST SUBSTATION

Contract No	26555
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Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

[illegible]

Notes

Originator

Checked &
Approved



TP


CD
22/01/2024

Determination of the Water Content



Sheet 1 of 1

				Site LT520 BRACO WEST SUBSTATION		Contract No 26555			
				Client SHE Transmission plc					
				Engineer SSE Perth Inveralmond HSE					
Sample Identification					Lab Sample ID	Non Engineering Description	Bulk Density	Dry Density	Water Content
Hole ID	Depth	Sample Ref	Sample Type						
	m								
BH11 NEW	0.50		B	2013107	Brown silty SAND and GRAVEL with organic material. Gravel is fine to coarse	2.09	1.53	36.4	
Notes									
Originator	Checked & Approved		BULK DENSITY BS EN ISO 17892-2 Determination of bulk density Linear measurement method				 Sheet 1 of 1		
TP	CD 22/01/2024								



SiteLT520 BRACO WEST SUBSTATION

ClientSHE Transmission plc

EngineerSSE Perth Inveralmond HSE

Contract No26555

HoleBH11 NEW

Sample Ref

Depth (m)0.50

Sample TypeB

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	93
28.0 mm	88
20.0 mm	82
14.0 mm	82
10.0 mm	78
6.30 mm	70
5.00 mm	67
3.35 mm	64
2.00 mm	60
1.18 mm	54
630 µm	47
425 µm	38
300 µm	26
200 µm	17
150 µm	10
63 µm	8

Non Engineering Description

Brown silty SAND and GRAVEL with organic material.
Gravel is fine to coarse

Sample Proportions - %

Cobbles	0.0
Gravel	40.2
Sand	52.2
Silt & Clay	7.6

Particle Density - Assumed (Mg/m3)2.65

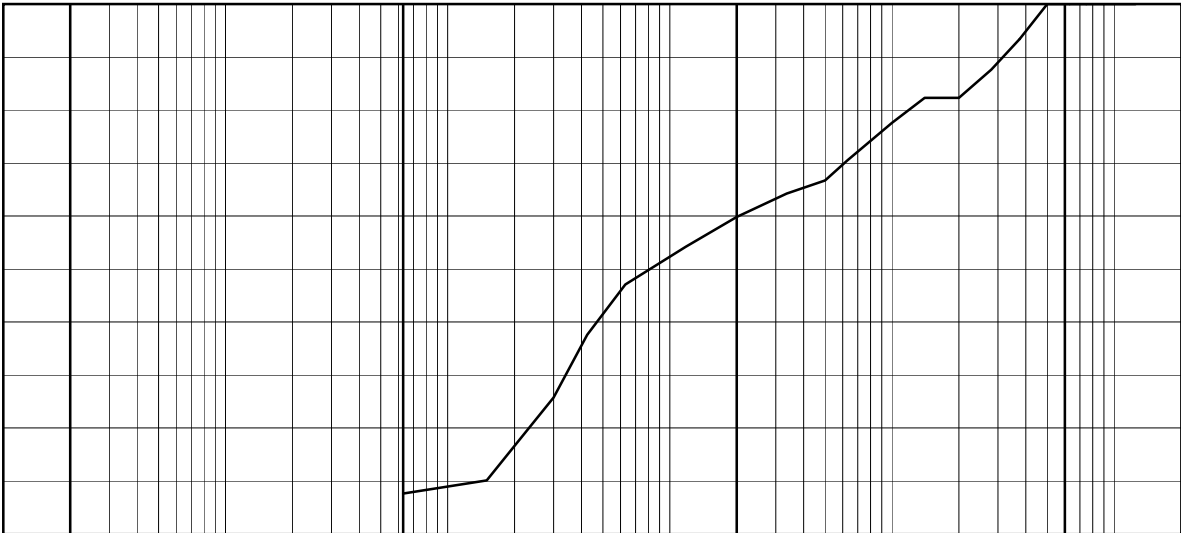
Particle Diameter - mm

D100	50
D60	2.0
D10	0.14
Uniformity Coefficient <small>(SHW series 600, Table 6/1, footnote 5)</small>	14.3

Notes

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			

Percentage Passing - %



Particle Size - mm

Originator


SM

Checked & Approved

CD
22/01/2024

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method




Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-19
Issue No 01

LABORATORY TEST REPORT

Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-19	Date samples received	13/12/2023
Your Ref	26555	Date written instructions received	14/12/2023
Purchase Order	26555	Date testing commenced	10/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	1	Determination of Water Content	Yes
	1	Bulk Density	Yes
	1	Particle Size Distribution	Yes
Remarks :			
Issued by : C Donnelly		Date of Issue : 22/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  22/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			



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Site LT520 BRACO WEST SUBSTATION

Contract No 26555

Client	SHE Transmission plc
--------	----------------------

Engineer SSE Perth Inveralmond HSE

[illegible]

Notes

Originator

Checked &
Approved



TP


CD
22/01/2024

Determination of the Water Content



Sheet 1 of 1

				Site LT520 BRACO WEST SUBSTATION		Contract No 26555			
				Client SHE Transmission plc					
				Engineer SSE Perth Inveralmond HSE					
Sample Identification					Lab Sample ID	Non Engineering Description	Bulk Density Mg/m³	Dry Density Mg/m³	Water Content %
Hole ID	Depth m	Sample Ref	Sample Type						
BH12 NEW	0.70		B						
					2013109	Brown silty SAND and GRAVEL. Gravel is fine to coarse	2.11	1.92	10.1
Notes									
Originator		Checked & Approved		BULK DENSITY BS EN ISO 17892-2 Determination of bulk density Linear measurement method				 Sheet 1 of 1	
TP		CD 22/01/2024							

	Site LT520 BRACO WEST SUBSTATION		Contract No 26555	
	Client SHE Transmission plc		Hole BH12 NEW	
	Engineer SSE Perth Inveralmond HSE		Sample Ref Depth (m) 0.70 Sample Type B	

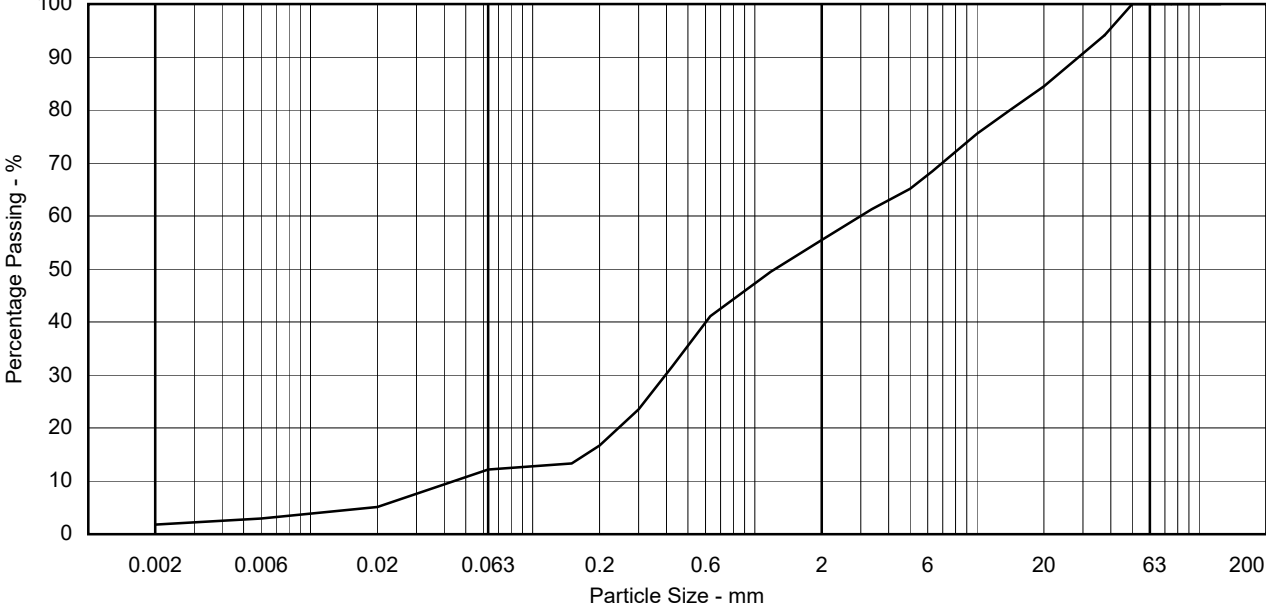
Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	94
28.0 mm	90
20.0 mm	84
14.0 mm	80
10.0 mm	76
6.30 mm	68
5.00 mm	65
3.35 mm	61
2.00 mm	55
1.18 mm	49
630 µm	41
425 µm	32
300 µm	23
200 µm	17
150 µm	13
63 µm	12
20 µm	5
6 µm	3
2 µm	2

Non Engineering Description	
Brown silty SAND and GRAVEL. Gravel is fine to coarse	

Sample Proportions - %	
Cobbles	0.0
Gravel	44.5
Sand	43.8
Silt	9.9
Clay	1.7
Particle Density - Assumed (Mg/m3) 2.65	
Particle Diameter - mm	
D100	50
D60	3.0
D10	0.045
Uniformity Coefficient (SHW series 600, Table 6/1, footnote 5) 66.7	


Notes	
Sedimentation sample not pre-treated	

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
Silt				Sand			Gravel			



Percentage Passing - %

Particle Size - mm

Originator	Checked & Approved	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method	
SM	CD 22/01/2024		

Sheet 1 of 1

Raeburn (Trading as igne) Hamilton
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Richard Butler

Report No: A15044-R1
Issue No 01

LABORATORY TEST REPORT




Project Name	LT520 BRACO WEST SUBSTATION		
Project Number	A15044-R1	Date samples received	09/01/2024
Your Ref	26555	Date written instructions received	14/12/2023
Purchase Order	26555	Date testing commenced	10/01/2024
Please find enclosed the results as summarised below			
Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	7	Water Content of Rock	Yes
	7	Bulk Density	Yes
	7	Resistance to Fragmentation by Los Angeles Method	Yes
	340	Point Load Index	Yes
	37	Uniaxial Compressive Strength	Yes
	37	Photographs of Post-UCS Test Specimens	n/a
Remarks : Interim results. Chemistry to follow			
Issued by : C Donnelly		Date of Issue : 25/01/2024	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  25/01/2024			
C Donnelly (Laboratory Coordinator), C Loudon (Quality Manager), I McMillan (Site Supervisor), S Gilchrist (Quality Supervisor), S McDonagh (Laboratory Supervisor)			
<p>Unless we are notified to the contrary, samples will be disposed after a period of one month from this date.</p> <p>All results contained in this report are provisional unless signed by an approved signatory.</p> <p>This report should not be reproduced except in full without the written approval of the laboratory.</p> <p>Under multisite accreditation, testing in this report may have been performed at another Terra Tek Ltd (Trading as igne) laboratory.</p> <p>The enclosed results remain the property of Terra Tek Limited (Trading as igne) and we reserve the right to withdraw our report if we have not received cleared funds in accordance with our standard terms and conditions</p> <p>Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation.</p> <p>Feedback on the this report may be left via our website www.igne.com/contact</p>			








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Head Office : Whistleberry Road, Hamilton, Glasgow, Scotland, ML3 0HP

				SiteLT520 BRACO WEST SUBSTATION				Contract No 26555	
				ClientSHE Transmission plc					
				EngineerSSE Perth Inveralmond HSE					
Sample Identification									
Location / Origin	Depth m	Sample Ref	Sample Type						
							%		
BH02	3.90-4.00		C	2013883	Reddish Brown Rock Core	08.01.24	16.0	~	
BH03	2.70-5.10		C	2013126	Reddish Brown Rock Core	08.01.24	6.7	~	
BH04	4.20-5.70		C	2013131	Reddish Brown Rock Core	08.01.24	5.7	~	
BH05	2.70-5.40		C	2013136	Reddish Brown Rock Core	08.01.24	6.3	~	
BH09	3.73-3.84		C	2013708	Reddish Brown Rock Core	08.01.24	3.4	~	
BH14	4.20-5.70		C	2013160	Reddish Brown Rock Core	08.01.24	7.1	~	
BH15	5.50-7.00		C	2013163	Reddish Brown Rock Core	08.01.24	7.8	~	
						UKAS accredited test			Yes
NotesOpinions and interpretations are outside the scope of UKAS accreditation.									
Originator		Approved		SUMMARY OF MOISTURE CONTENT BS1377 : 1990 : Part 2					
DW		 25/01/2024							
								Sheet 1 of 1	

		Site LT520 BRACO WEST SUBSTATION				Contract No 26555		
		Client SHE Transmission plc						
		Engineer SSE Perth Inveralmond HSE						
Sample Identification								
Hole ID	Depth	Sample Ref	Sample Type	Lab Sample ID				
	m				Non Engineering Description	Bulk Density	Dry Density	Water Content
						Mg/m³	Mg/m³	%
BH03	2.70-5.10		C	2013126		2.52	2.48	1.5
BH04	4.67-4.75		C	2013707		2.46	2.42	1.6
BH05	2.70-5.40		C	2013136		2.42	2.37	1.9
BH09	3.73-3.84		C	2013708		2.4	2.38	0.9
BH14	4.20-5.70		C	2013160		2.17	2.08	4.1
BH15	5.50-7.00		C	2013163		2.29	2.25	1.7
Notes								
Originator	Checked & Approved		BULK DENSITY BS EN ISO 17892-2 Determination of bulk density Linear measurement method					
DW	 25/01/2024							
Sheet 1 of 1								

				Site LT520 BRACO WEST SUBSTATION				Contract No 26555	
				Client SHE Transmission plc					
				Engineer SSE Perth Inveralmond HSE					
Sample Identification				Lab Sample ID	10-14mm Size Fraction Passing 11.2mm Sieve	Particle Density (8-12.5 mm) Mg/m³	Los Angeles Coefficient LA	Impact Value SZ	Test Date
Hole ID	Depth m	Sample Ref	Sample Type						
BH02	3.30-4.80		C	2013123	35	~	30	~	~
BH03	2.70-5.10		C	2013126	35	~	25	~	~
BH04	4.20-5.70		C	2013131	35	~	23	~	~
BH05	2.70-5.40		C	2013136	35	~	22	~	~
BH09	2.90-5.04		C	2013149	35	~	28	~	~
BH14	4.20-5.70		C	2013160	35	~	23	~	~
BH15	5.50-7.00		C	2013163	35	~	24	~	~
UKAS accredited test							Yes	No	
Notes Opinions and interpretations are outside the scope of UKAS accreditation.									
Originator		Approved		RESISTANCE TO FRAGMENTATION BY LOS ANGELES AND IMPACT TEST METHODS BS EN 1097-2:2020					
DW		CD 25/01/2024							
Sheet 1 of 1									

		Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
		Client SHE Transmission plc						
		Engineer SSE Perth Inveralmond HSE						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH01	4.20-4.40	Axial	101.0	70.0	0.1	0.01	0.01	
BH01	4.20-4.40	Axial	101.0	60.0	0.4	0.05	0.07	
BH01	4.20-4.40	Axial	101.0	45.0	0.2	0.03	0.04	
BH01	4.20-4.40	Axial	101.0	65.0	0.2	0.02	0.03	
BH01	4.20-4.40	Axial	101.0	29.0	0.1	0.03	0.03	
BH01	4.20-4.40	Diametral	175.0	101.0	0.4	0.04	0.05	
BH01	4.20-4.40	Diametral	120.0	101.0	0.3	0.03	0.04	
BH01	4.20-4.40	Diametral	75.0	101.0	0.2	0.02	0.03	
BH01	4.20-4.40	Diametral	65.0	101.0	0.3	0.03	0.04	
BH01	4.20-4.40	Diametral	40.0	101.0	0.4	0.04	0.05	
Notes <div> <div> 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation </div> <div> 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation </div> </div>								
Originator	Approved	POINT LOAD INDEX TESTS						
DW	 25/01/2024							
<div> <div>Sheet 1 of 34</div> </div>								



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH01	6.30-6.60	Axial	100.0	49.0	3.6	0.58	0.71	
BH01	6.30-6.60	Axial	101.0	65.0	11.1	1.33	1.74	
BH01	6.30-6.60	Axial	100.0	86.0	13.3	1.21	1.69	
BH01	6.30-6.60	Axial	100.0	64.0	11.7	1.44	1.87	
BH01	6.30-6.60	Axial	100.0	54.0	5.4	0.79	0.99	
BH01	6.30-6.60	Diametral	310.0	100.0	7.3	0.73	1.00	
BH01	6.30-6.60	Diametral	144.0	101.0	6.4	0.63	0.86	
BH01	6.30-6.60	Diametral	199.0	100.0	2.9	0.29	0.40	
BH01	6.30-6.60	Diametral	117.0	100.0	4.8	0.48	0.66	
BH01	6.30-6.60	Diametral	96.0	101.0	4.0	0.39	0.54	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH02	3.20-3.60	Lump	91.0	46.0	0.9	0.17	0.20	
BH02	3.20-3.60	Lump	93.0	58.0	2.0	0.29	0.37	
BH02	3.20-3.60	Lump	71.0	50.0	2.2	0.49	0.56	
BH02	3.20-3.60	Lump	72.0	46.0	3.2	0.76	0.85	
BH02	3.20-3.60	Lump	63.0	39.0	1.2	0.38	0.40	
BH02	3.20-3.60	Lump	76.0	33.0	1.8	0.56	0.60	
BH02	3.20-3.60	Lump	69.0	25.0	1.9	0.87	0.84	
BH02	3.20-3.60	Lump	47.0	30.0	0.4	0.22	0.21	
BH02	3.20-3.60	Lump	59.0	29.0	0.7	0.32	0.31	
BH02	3.20-3.60	Lump	52.0	32.0	1.1	0.52	0.50	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH02	5.40-5.60	Lump	94.0	52.0	4.4	0.71	0.87	
BH02	5.40-5.60	Lump	73.0	35.0	1.1	0.34	0.36	
BH02	5.40-5.60	Lump	92.0	45.0	1.0	0.19	0.22	
BH02	5.40-5.60	Lump	88.0	20.0	0.7	0.31	0.30	
BH02	5.40-5.60	Lump	80.0	34.0	1.1	0.32	0.34	
BH02	5.40-5.60	Lump	79.0	48.0	1.8	0.37	0.43	
BH02	5.40-5.60	Lump	97.0	31.0	0.9	0.24	0.26	
BH02	5.40-5.60	Lump	85.0	54.0	1.5	0.26	0.31	
BH02	5.40-5.60	Lump	47.0	25.0	1.8	1.20	1.07	
BH02	5.40-5.60	Lump	56.0	29.0	1.4	0.68	0.65	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH02	6.00-6.50	Lump	86.0	65.0	5.1	0.72	0.91	
BH02	6.00-6.50	Lump	90.0	52.0	2.1	0.35	0.43	
BH02	6.00-6.50	Lump	89.0	48.0	3.9	0.72	0.85	
BH02	6.00-6.50	Lump	68.0	35.0	0.9	0.30	0.31	
BH02	6.00-6.50	Lump	69.0	38.0	4.1	1.23	1.31	
BH02	6.00-6.50	Lump	58.0	41.0	2.1	0.69	0.72	
BH02	6.00-6.50	Lump	74.0	62.0	2.9	0.50	0.60	
BH02	6.00-6.50	Lump	88.0	32.0	0.7	0.20	0.21	
BH02	6.00-6.50	Lump	56.0	21.0	1.5	1.00	0.89	
BH02	6.00-6.50	Lump	78.0	39.0	2.3	0.59	0.66	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation




2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		

		Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
		Client SHE Transmission plc						
		Engineer SSE Perth Inveralmond HSE						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH03	3.10-3.20	Axial	100.0	32.0	1.9	0.47	0.52	
BH03	3.10-3.20	Axial	99.0	16.0	0.9	0.45	0.43	
BH03	3.10-3.20	Axial	99.0	36.0	2.4	0.53	0.60	
BH03	3.10-3.20	Axial	100.0	21.0	2.1	0.79	0.80	
BH03	3.10-3.20	Axial	100.0	29.0	1.5	0.41	0.44	
BH03	3.10-3.20	Diametral	70.0	100.0	0.4	0.04	0.05	
BH03	3.10-3.20	Diametral	120.0	100.0	1.2	0.12	0.16	
BH03	3.10-3.20	Diametral	136.0	100.0	0.7	0.07	0.10	
BH03	3.10-3.20	Diametral	89.0	99.0	1.5	0.15	0.21	
BH03	3.10-3.20	Diametral	98.0	100.0	0.6	0.06	0.08	
Notes <div> <div> 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation </div> <div> 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation </div> </div>								
Originator	Approved	POINT LOAD INDEX TESTS						
DW	 25/01/2024							
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Site

LT520 BRACO WEST SUBSTATION

Client


SHE Transmission plc




Engineer




SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH03	5.42-5.92	Axial	101.0	79.0	14.8	1.46	2.00	
BH03	5.42-5.92	Axial	101.0	56.0	12.5	1.74	2.20	
BH03	5.42-5.92	Axial	101.0	66.0	11.6	1.37	1.80	
BH03	5.42-5.92	Axial	100.0	45.0	12.7	2.22	2.67	
BH03	5.42-5.92	Axial	101.0	33.0	13.0	3.06	3.45	
BH03	5.42-5.92	Diametral	157.0	101.0	13.8	1.35	1.86	
BH03	5.42-5.92	Diametral	73.0	101.0	9.8	0.96	1.32	
BH03	5.42-5.92	Diametral	83.0	101.0	8.5	0.83	1.14	
BH03	5.42-5.92	Diametral	112.0	101.0	10.1	0.99	1.36	
BH03	5.42-5.92	Diametral	109.0	101.0	10.9	1.07	1.47	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
Originator	Approved	POINT LOAD INDEX TESTS						
DW	CD 25/01/2024							

		Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
		Client SHE Transmission plc						
		Engineer SSE Perth Inveralmond HSE						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH04	4.80-5.00	Axial	100.0	68.0	5.9	0.68	0.90	
BH04	4.80-5.00	Axial	100.0	35.0	17.4	3.90	4.45	
BH04	4.80-5.00	Axial	100.0	39.0	10.1	2.03	2.37	
BH04	4.80-5.00	Axial	100.0	45.0	16.3	2.84	3.43	
BH04	4.80-5.00	Axial	100.0	40.0	14.5	2.85	3.34	
BH04	4.80-5.00	Diametral	79.0	100.0	14.1	1.41	1.93	
BH04	4.80-5.00	Diametral	88.0	101.0	13.5	1.32	1.82	
BH04	4.80-5.00	Diametral	70.0	100.0	14.2	1.42	1.94	
BH04	4.80-5.00	Diametral	102.0	100.0	12.1	1.21	1.65	
BH04	4.80-5.00	Diametral	123.0	100.0	13.6	1.36	1.86	
Notes <div> <div> 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation </div> <div> 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation </div> </div>								
Originator	Approved	POINT LOAD INDEX TESTS						
DW	 25/01/2024							
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		Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
		Client SHE Transmission plc						
		Engineer SSE Perth Inveralmond HSE						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH05	2.83-3.10	Axial	100.0	53.0	2.8	0.41	0.52	
BH05	2.83-3.10	Axial	100.0	55.0	7.3	1.04	1.31	
BH05	2.83-3.10	Axial	100.0	64.0	18.1	2.22	2.90	
BH05	2.83-3.10	Axial	100.0	50.0	19.7	3.09	3.82	
BH05	2.83-3.10	Axial	100.0	42.0	15.9	2.97	3.53	
BH05	2.83-3.10	Diametral	133.0	100.0	15.8	1.58	2.16	
BH05	2.83-3.10	Diametral	109.0	100.0	1.1	0.11	0.15	
BH05	2.83-3.10	Diametral	99.0	100.0	10.2	1.02	1.39	
BH05	2.83-3.10	Diametral	56.0	100.0	5.6	0.56	0.76	
BH05	2.83-3.10	Diametral	89.0	100.0	3.6	0.36	0.49	
Notes <div> <div> 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation </div> <div> 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation </div> </div>								
Originator	Approved	POINT LOAD INDEX TESTS						
DW	 25/01/2024							
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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH05	5.40-6.72	Axial	100.0	52.0	6.5	0.98	1.22	
BH05	5.40-6.72	Axial	101.0	43.0	6.2	1.12	1.34	
BH05	5.40-6.72	Axial	101.0	56.0	4.5	0.62	0.79	
BH05	5.40-6.72	Axial	100.0	62.0	3.8	0.48	0.62	
BH05	5.40-6.72	Axial	100.0	61.0	13.0	1.67	2.16	
BH05	5.40-6.72	Diametral	110.0	101.0	5.3	0.52	0.71	
BH05	5.40-6.72	Diametral	163.0	100.0	3.7	0.37	0.51	
BH05	5.40-6.72	Diametral	114.0	101.0	11.2	1.10	1.51	
BH05	5.40-6.72	Diametral	128.0	100.0	8.4	0.84	1.15	
BH05	5.40-6.72	Diametral	96.0	100.0	5.9	0.59	0.81	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH06	3.05-3.30	Axial	102.0	46.0	0.7	0.12	0.14	
BH06	3.05-3.30	Axial	101.0	36.0	0.3	0.06	0.07	
BH06	3.05-3.30	Axial	102.0	40.0	0.1	0.02	0.02	
BH06	3.05-3.30	Axial	102.0	56.0	0.1	0.01	0.02	
BH06	3.05-3.30	Axial	102.0	32.0	0.4	0.10	0.11	
BH06	3.05-3.30	Diametral	101.0	102.0	0.6	0.06	0.08	
BH06	3.05-3.30	Diametral	126.0	102.0	0.5	0.05	0.07	
BH06	3.05-3.30	Diametral	89.0	102.0	0.2	0.02	0.03	
BH06	3.05-3.30	Diametral	81.0	102.0	0.2	0.02	0.03	
BH06	3.05-3.30	Diametral	56.0	102.0	0.6	0.06	0.08	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH06	6.05-6.30	Axial	102.0	61.0	12.7	1.60	2.08	
BH06	6.05-6.30	Axial	102.0	54.0	5.6	0.80	1.01	
BH06	6.05-6.30	Axial	102.0	55.0	11.8	1.65	2.09	
BH06	6.05-6.30	Axial	102.0	35.0	10.5	2.31	2.64	
BH06	6.05-6.30	Axial	102.0	46.0	9.6	1.61	1.95	
BH06	6.05-6.30	Diametral	212.0	102.0	4.3	0.41	0.57	
BH06	6.05-6.30	Diametral	130.0	103.0	4.0	0.38	0.52	
BH06	6.05-6.30	Diametral	95.0	102.0	12.2	1.17	1.62	
BH06	6.05-6.30	Diametral	56.0	103.0	5.9	0.56	0.77	
BH06	6.05-6.30	Diametral	66.0	102.0	8.6	0.83	1.14	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH07	3.70-4.00	Axial	99.0	36.0	3.4	0.75	0.86	
BH07	3.70-4.00	Axial	99.0	41.0	1.3	0.25	0.30	
BH07	3.70-4.00	Axial	99.0	45.0	5.7	1.00	1.21	
BH07	3.70-4.00	Axial	99.0	61.0	8.6	1.12	1.44	
BH07	3.70-4.00	Axial	99.0	54.0	6.2	0.91	1.14	
BH07	3.70-4.00	Diametral	111.0	99.0	7.7	0.79	1.07	
BH07	3.70-4.00	Diametral	114.0	99.0	10.9	1.11	1.51	
BH07	3.70-4.00	Diametral	107.0	100.0	9.2	0.92	1.26	
BH07	3.70-4.00	Diametral	85.0	100.0	8.4	0.84	1.15	
BH07	3.70-4.00	Diametral	124.0	99.0	8.0	0.82	1.11	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH07	5.10-5.50	Axial	102.0	82.0	15.7	1.47	2.04	
BH07	5.10-5.50	Axial	102.0	74.0	17.0	1.77	2.39	
BH07	5.10-5.50	Axial	102.0	60.0	9.4	1.21	1.56	
BH07	5.10-5.50	Axial	102.0	45.0	5.8	0.99	1.20	
BH07	5.10-5.50	Axial	102.0	50.0	8.9	1.37	1.70	
BH07	5.10-5.50	Diametral	117.0	102.0	8.2	0.79	1.09	
BH07	5.10-5.50	Diametral	120.0	102.0	11.7	1.12	1.55	
BH07	5.10-5.50	Diametral	107.0	103.0	10.5	0.99	1.37	
BH07	5.10-5.50	Diametral	85.0	103.0	11.0	1.04	1.44	
BH07	5.10-5.50	Diametral	98.0	103.0	13.5	1.27	1.76	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated


3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985




4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
Client SHE Transmission plc						
Engineer SSE Perth Inveralmond HSE						
Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
	mm	mm	kN	MN/m ²	MN/m ²	
Lump	103.0	60.0	1.0	0.13	0.16	
Lump	100.0	30.0	2.4	0.63	0.69	
Lump	96.0	45.0	1.4	0.25	0.30	
Lump	92.0	47.0	1.5	0.27	0.33	
Lump	100.0	43.0	1.9	0.35	0.41	
Lump	85.0	40.0	0.3	0.07	0.08	
Lump	95.0	42.0	1.1	0.22	0.25	
Lump	88.0	56.0	1.7	0.27	0.33	
Lump	98.0	42.0	1.4	0.27	0.32	
Lump	70.0	36.0	1.3	0.41	0.43	
<div> <div> Minimum Width for Lump Tests Length for Diametral Tests Diameter for Axial Tests Open Separation </div> <div> 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation </div> </div>						
<div> <div>POINT LOAD INDEX TESTS</div> <div>  </div> </div>						<div>Sheet 15 of 34</div>

		Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
		Client SHE Transmission plc						
		Engineer SSE Perth Inveralmond HSE						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH08	4.72-4.90	Axial	100.0	48.0	17.7	2.90	3.54	
BH08	4.72-4.90	Axial	100.0	34.0	14.3	3.30	3.74	
BH08	4.72-4.90	Axial	100.0	46.0	20.7	3.53	4.28	
BH08	4.72-4.90	Axial	100.0	35.0	16.3	3.66	4.17	
BH08	4.72-4.90	Axial	100.0	46.0	17.4	2.97	3.60	
BH08	4.72-4.90	Diametral	143.0	100.0	18.3	1.83	2.50	
BH08	4.72-4.90	Diametral	78.0	100.0	20.7	2.07	2.83	
BH08	4.72-4.90	Diametral	68.0	100.0	10.6	1.06	1.45	
BH08	4.72-4.90	Diametral	103.0	100.0	15.5	1.55	2.12	
BH08	4.72-4.90	Diametral	87.0	100.0	16.9	1.69	2.31	
Notes <div> <div> 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation </div> <div> 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation </div> </div>								
Originator	Approved	POINT LOAD INDEX TESTS						
DW	 25/01/2024							
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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH09	3.84-4.05	Axial	100.0	62.0	10.5	1.33	1.72	
BH09	3.84-4.05	Axial	100.0	44.0	13.2	2.36	2.83	
BH09	3.84-4.05	Axial	100.0	24.0	6.2	2.03	2.12	
BH09	3.84-4.05	Axial	100.0	40.0	13.6	2.67	3.13	
BH09	3.84-4.05	Axial	100.0	48.0	18.1	2.96	3.62	
BH09	3.84-4.05	Diametral	188.0	100.0	15.2	1.52	2.08	
BH09	3.84-4.05	Diametral	91.0	101.0	11.6	1.14	1.56	
BH09	3.84-4.05	Diametral	92.0	100.0	6.4	0.64	0.87	
BH09	3.84-4.05	Diametral	125.0	100.0	11.2	1.12	1.53	
BH09	3.84-4.05	Diametral	82.0	101.0	9.5	0.93	1.28	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated
3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985
4. Opinions and interpretations are outside the scope of UKAS accreditation
5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH10	1.85-2.10	Lump	64.0	21.0	0.7	0.41	0.38	
BH10	1.85-2.10	Lump	67.0	23.0	0.6	0.31	0.29	
BH10	1.85-2.10	Lump	99.0	20.0	0.9	0.36	0.36	
BH10	1.85-2.10	Lump	71.0	44.0	0.2	0.05	0.06	
BH10	1.85-2.10	Lump	62.0	39.0	0.7	0.23	0.24	
BH10	1.85-2.10	Lump	66.0	35.0	1.0	0.34	0.35	
BH10	1.85-2.10	Lump	82.0	19.0	0.4	0.20	0.19	
BH10	1.85-2.10	Lump	84.0	33.0	0.8	0.23	0.24	
BH10	1.85-2.10	Lump	55.0	29.0	0.5	0.25	0.23	
BH10	1.85-2.10	Lump	96.0	36.0	0.8	0.18	0.21	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



LT520 BRACO WEST SUBSTATION

Contract No	26555
-------------	--------------

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m²	MN/m²	
BH10	2.80-3.10	Axial	101.0	25.0	0.8	0.25	0.26	
BH10	2.80-3.10	Axial	101.0	40.0	0.2	0.04	0.05	
BH10	2.80-3.10	Axial	101.0	21.0	0.4	0.15	0.15	
BH10	2.80-3.10	Axial	101.0	26.0	0.2	0.06	0.06	
BH10	2.80-3.10	Axial	101.0	35.0	0.3	0.07	0.08	
BH10	2.80-3.10	Diametral	136.0	101.0	0.4	0.04	0.05	
BH10	2.80-3.10	Diametral	89.0	102.0	0.2	0.02	0.03	
BH10	2.80-3.10	Diametral	95.0	102.0	0.3	0.03	0.04	
BH10	2.80-3.10	Diametral	56.0	101.0	0.2	0.02	0.03	
BH10	2.80-3.10	Diametral	42.0	101.0	0.1	0.01	0.01	

Notes

- | | |
|---|---|
| 1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation | 2. Moisture Content of sample : saturated
3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985
4. Opinions and interpretations are outside the scope of UKAS accreditation
5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation |
|---|---|

Originator	Approved	<div>POINT LOAD INDEX TESTS</div>	<div></div>
DW	<div>CD</div> <div>25/01/2024</div>		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH10	3.10-3.50	Axial	99.0	27.0	6.7	1.97	2.11	
BH10	3.10-3.50	Axial	99.0	29.0	6.4	1.75	1.91	
BH10	3.10-3.50	Axial	99.0	24.0	5.8	1.92	2.00	
BH10	3.10-3.50	Axial	99.0	32.0	10.1	2.50	2.79	
BH10	3.10-3.50	Axial	99.0	25.0	4.6	1.46	1.54	
BH10	3.10-3.50	Diametral	77.0	99.0	8.4	0.86	1.17	
BH10	3.10-3.50	Diametral	87.0	99.0	1.4	0.14	0.19	
BH10	3.10-3.50	Diametral	71.0	99.0	7.0	0.71	0.97	
BH10	3.10-3.50	Diametral	71.0	99.0	7.5	0.77	1.04	
BH10	3.10-3.50	Diametral	85.0	99.0	7.9	0.81	1.10	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated
3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985
4. Opinions and interpretations are outside the scope of UKAS accreditation
5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH11	2.45-2.68	Axial	102.0	62.0	14.0	1.74	2.26	
BH11	2.45-2.68	Axial	102.0	44.0	4.2	0.73	0.89	
BH11	2.45-2.68	Axial	102.0	23.0	4.2	1.41	1.46	
BH11	2.45-2.68	Axial	102.0	49.0	7.5	1.18	1.45	
BH11	2.45-2.68	Axial	102.0	47.0	13.7	2.24	2.74	
BH11	2.45-2.68	Diametral	193.0	102.0	5.8	0.56	0.77	
BH11	2.45-2.68	Diametral	137.0	102.0	2.3	0.22	0.30	
BH11	2.45-2.68	Diametral	120.0	103.0	4.5	0.42	0.59	
BH11	2.45-2.68	Diametral	95.0	103.0	2.9	0.27	0.38	
BH11	2.45-2.68	Diametral	91.0	103.0	6.5	0.61	0.85	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
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Site

LT520 BRACO WEST SUBSTATION

Client

SHE Transmission plc

Engineer

SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH12	2.70-2.85	Axial	100.0	59.0	14.7	1.96	2.51	
BH12	2.70-2.85	Axial	100.0	65.0	15.3	1.85	2.42	
BH12	2.70-2.85	Axial	100.0	49.0	9.4	1.51	1.85	
BH12	2.70-2.85	Axial	100.0	57.0	13.1	1.81	2.29	
BH12	2.70-2.85	Axial	100.0	24.0	3.4	1.11	1.16	
BH12	2.70-2.85	Diametral	164.0	100.0	13.6	1.36	1.86	
BH12	2.70-2.85	Diametral	134.0	100.0	14.4	1.44	1.97	
BH12	2.70-2.85	Diametral	98.0	100.0	10.8	1.08	1.48	
BH12	2.70-2.85	Diametral	76.0	100.0	6.8	0.68	0.93	
BH12	2.70-2.85	Diametral	90.0	100.0	11.2	1.12	1.53	


Notes



1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation




2. Moisture Content of sample : saturated
3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985
4. Opinions and interpretations are outside the scope of UKAS accreditation
5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
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Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
Client SHE Transmission plc						
Engineer SSE Perth Inveralmond HSE						
Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
	mm	mm	kN	MN/m ²	MN/m ²	
Axial	100.0	56.0	23.3	3.27	4.14	
Axial	100.0	59.0	20.6	2.74	3.51	
Axial	100.0	45.0	21.5	3.75	4.52	
Axial	100.0	61.0	19.2	2.47	3.19	
Axial	100.0	40.0	19.0	3.73	4.38	
Diametral	186.0	101.0	18.0	1.76	2.42	
Diametral	145.0	101.0	17.8	1.74	2.39	
Diametral	193.0	100.0	19.0	1.90	2.60	
Diametral	112.0	100.0	16.3	1.63	2.23	
Diametral	94.0	100.0	16.8	1.68	2.29	
<div> <div> Minimum Width for Lump Tests Length for Diametral Tests Diameter for Axial Tests Open Separation </div> <div> 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation </div> </div>						
<div> <div>POINT LOAD INDEX TESTS</div> <div>  </div> </div>						<div>Sheet 23 of 34</div>

		Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
		Client SHE Transmission plc						
		Engineer SSE Perth Inveralmond HSE						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
BH13	4.20-5.20	Lump	132.0	70.0	2.6	0.22	0.31	
BH13	4.20-5.20	Lump	119.0	71.0	5.0	0.46	0.65	
BH13	4.20-5.20	Lump	111.0	59.0	2.5	0.30	0.39	
BH13	4.20-5.20	Lump	104.0	46.0	1.4	0.23	0.28	
BH13	4.20-5.20	Lump	85.0	35.0	0.8	0.21	0.23	
BH13	4.20-5.20	Lump	81.0	40.0	3.5	0.85	0.95	
BH13	4.20-5.20	Lump	88.0	25.0	0.6	0.21	0.22	
BH13	4.20-5.20	Lump	69.0	32.0	0.6	0.21	0.22	
BH13	4.20-5.20	Lump	79.0	42.0	2.9	0.69	0.77	
BH13	4.20-5.20	Lump	62.0	30.0	1.1	0.46	0.46	
Notes 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation								
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		Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
		Client SHE Transmission plc						
		Engineer SSE Perth Inveralmond HSE						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH13	6.80-7.00	Axial	99.0	92.0	8.5	0.73	1.04	
BH13	6.80-7.00	Axial	99.0	48.0	5.1	0.84	1.03	
BH13	6.80-7.00	Axial	99.0	46.0	13.2	2.28	2.75	
BH13	6.80-7.00	Axial	99.0	41.0	13.6	2.63	3.10	
BH13	6.80-7.00	Axial	99.0	32.0	15.8	3.92	4.36	
BH13	6.80-7.00	Diametral	179.0	100.0	21.2	2.12	2.90	
BH13	6.80-7.00	Diametral	106.0	100.0	7.3	0.73	1.00	
BH13	6.80-7.00	Diametral	107.0	100.0	18.8	1.88	2.57	
BH13	6.80-7.00	Diametral	124.0	100.0	16.5	1.65	2.25	
BH13	6.80-7.00	Diametral	100.0	100.0	20.0	2.00	2.73	
Notes <div> <div> 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation </div> <div> 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation </div> </div>								
Originator	Approved	POINT LOAD INDEX TESTS						
DW	 25/01/2024							
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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH14	3.10-3.35	Lump	120.0	50.0	0.9	0.12	0.15	
BH14	3.10-3.35	Lump	134.0	46.0	2.8	0.36	0.46	
BH14	3.10-3.35	Lump	110.0	59.0	0.5	0.06	0.08	
BH14	3.10-3.35	Lump	101.0	40.0	2.0	0.39	0.46	
BH14	3.10-3.35	Lump	114.0	32.0	0.6	0.13	0.15	
BH14	3.10-3.35	Lump	119.0	42.0	0.4	0.06	0.08	
BH14	3.10-3.35	Lump	91.0	36.0	1.3	0.31	0.35	
BH14	3.10-3.35	Lump	75.0	42.0	0.9	0.22	0.25	
BH14	3.10-3.35	Lump	63.0	52.0	1.3	0.31	0.35	
BH14	3.10-3.35	Lump	54.0	31.0	0.5	0.23	0.23	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH14	4.20-5.70	Axial	100.0	54.0	0.6	0.09	0.11	
BH14	4.20-5.70	Axial	100.0	62.0	1.6	0.20	0.26	
BH14	4.20-5.70	Axial	100.0	32.0	1.2	0.29	0.33	
BH14	4.20-5.70	Axial	100.0	41.0	2.0	0.38	0.45	
BH14	4.20-5.70	Axial	100.0	50.0	1.0	0.16	0.19	
BH14	4.20-5.70	Diametral	185.0	100.0	0.9	0.09	0.12	
BH14	4.20-5.70	Diametral	142.0	100.0	1.5	0.15	0.20	
BH14	4.20-5.70	Diametral	156.0	100.0	2.0	0.20	0.27	
BH14	4.20-5.70	Diametral	124.0	100.0	1.4	0.14	0.19	
BH14	4.20-5.70	Diametral	100.0	100.0	0.3	0.03	0.04	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation




2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		

		Site LT520 BRACO WEST SUBSTATION						Contract No 26555 ~ Indicates test not carried out
		Client SHE Transmission plc						
		Engineer SSE Perth Inveralmond HSE						
Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH15	2.00-3.00	Lump	107.0	86.0	1.4	0.12	0.17	
BH15	2.00-3.00	Lump	94.0	44.0	5.7	1.08	1.28	
BH15	2.00-3.00	Lump	56.0	31.0	1.3	0.59	0.57	
BH15	2.00-3.00	Lump	92.0	45.0	2.0	0.38	0.45	
BH15	2.00-3.00	Lump	99.0	60.0	5.7	0.75	0.97	
BH15	2.00-3.00	Lump	87.0	51.0	1.2	0.21	0.26	
BH15	2.00-3.00	Lump	43.0	46.0	1.5	0.60	0.60	
BH15	2.00-3.00	Lump	82.0	57.0	3.0	0.50	0.61	
BH15	2.00-3.00	Lump	95.0	45.0	1.6	0.29	0.35	
BH15	2.00-3.00	Lump	66.0	32.0	2.0	0.74	0.76	
Notes <div> <div> 1. Dimension A= Minimum Width for Lump Tests Dimension A=Length for Diametral Tests Dimension A=Diameter for Axial Tests Dimension B=Platen Separation </div> <div> 2. Moisture Content of sample : saturated 3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985 4. Opinions and interpretations are outside the scope of UKAS accreditation 5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation </div> </div>								
Originator	Approved	POINT LOAD INDEX TESTS						
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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH15	3.00-4.00	Axial	101.0	56.0	1.6	0.22	0.28	
BH15	3.00-4.00	Axial	101.0	59.0	1.5	0.20	0.25	
BH15	3.00-4.00	Axial	101.0	23.0	2.0	0.68	0.70	
BH15	3.00-4.00	Axial	101.0	34.0	0.9	0.21	0.23	
BH15	3.00-4.00	Axial	101.0	44.0	1.2	0.21	0.25	
BH15	3.00-4.00	Diametral	156.0	101.0	2.1	0.21	0.28	
BH15	3.00-4.00	Diametral	124.0	101.0	1.2	0.12	0.16	
BH15	3.00-4.00	Diametral	136.0	101.0	1.0	0.10	0.13	
BH15	3.00-4.00	Diametral	95.0	101.0	2.5	0.25	0.34	
BH15	3.00-4.00	Diametral	102.0	101.0	0.9	0.09	0.12	

Notes

1. Dimension A= Minimum Width for Lump Tests
 Dimension A=Length for Diametral Tests
 Dimension A=Diameter for Axial Tests
 Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH15	4.60-4.85	Axial	99.0	47.0	16.5	2.79	3.38	
BH15	4.60-4.85	Axial	99.0	44.0	9.7	1.75	2.09	
BH15	4.60-4.85	Axial	99.0	42.0	16.9	3.19	3.78	
BH15	4.60-4.85	Axial	99.0	50.0	19.9	3.16	3.89	
BH15	4.60-4.85	Axial	99.0	55.0	13.8	1.99	2.50	
BH15	4.60-4.85	Diametral	118.0	99.0	18.9	1.93	2.62	
BH15	4.60-4.85	Diametral	76.0	100.0	9.0	0.90	1.23	
BH15	4.60-4.85	Diametral	88.0	100.0	11.0	1.10	1.50	
BH15	4.60-4.85	Diametral	56.0	100.0	15.4	1.54	2.10	
BH15	4.60-4.85	Diametral	111.0	99.0	11.9	1.21	1.65	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated
3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985
4. Opinions and interpretations are outside the scope of UKAS accreditation
5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH18	4.90-5.50	Lump	87.0	41.0	4.2	0.92	1.06	
BH18	4.90-5.50	Lump	66.0	32.0	3.1	1.15	1.17	
BH18	4.90-5.50	Lump	153.0	46.0	4.5	0.50	0.67	
BH18	4.90-5.50	Lump	88.0	42.0	1.8	0.38	0.44	
BH18	4.90-5.50	Lump	78.0	48.0	1.3	0.27	0.32	
BH18	4.90-5.50	Lump	89.0	42.0	2.1	0.44	0.51	
BH18	4.90-5.50	Lump	91.0	73.0	5.5	0.65	0.86	
BH18	4.90-5.50	Lump	189.0	69.0	6.9	0.42	0.64	
BH18	4.90-5.50	Lump	98.0	60.0	1.3	0.17	0.22	
BH18	4.90-5.50	Lump	96.0	70.0	2.2	0.26	0.34	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated
3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985
4. Opinions and interpretations are outside the scope of UKAS accreditation
5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH18	6.80-7.00	Axial	102.0	56.0	13.4	1.84	2.34	
BH18	6.80-7.00	Axial	102.0	46.0	8.4	1.41	1.71	
BH18	6.80-7.00	Axial	102.0	38.0	12.4	2.51	2.93	
BH18	6.80-7.00	Axial	102.0	32.0	9.6	2.31	2.59	
BH18	6.80-7.00	Axial	102.0	45.0	8.8	1.51	1.82	
BH18	6.80-7.00	Diametral	204.0	102.0	3.7	0.36	0.49	
BH18	6.80-7.00	Diametral	108.0	102.0	9.8	0.94	1.30	
BH18	6.80-7.00	Diametral	101.0	103.0	5.6	0.53	0.73	
BH18	6.80-7.00	Diametral	156.0	103.0	6.5	0.61	0.85	
BH18	6.80-7.00	Diametral	98.0	103.0	3.9	0.37	0.51	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated

3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985

4. Opinions and interpretations are outside the scope of UKAS accreditation

5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH19	2.70-4.20	Axial	99.0	56.0	3.2	0.45	0.57	
BH19	2.70-4.20	Axial	99.0	42.0	3.0	0.57	0.67	
BH19	2.70-4.20	Axial	99.0	41.0	1.5	0.29	0.34	
BH19	2.70-4.20	Axial	99.0	35.0	2.6	0.59	0.67	
BH19	2.70-4.20	Axial	99.0	63.0	1.9	0.24	0.31	
BH19	2.70-4.20	Diametral	213.0	99.0	3.1	0.32	0.43	
BH19	2.70-4.20	Diametral	156.0	99.0	2.4	0.24	0.33	
BH19	2.70-4.20	Diametral	95.0	99.0	2.0	0.20	0.28	
BH19	2.70-4.20	Diametral	119.0	99.0	1.5	0.15	0.21	
BH19	2.70-4.20	Diametral	85.0	99.0	4.2	0.43	0.58	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated
3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985
4. Opinions and interpretations are outside the scope of UKAS accreditation
5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
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Contract No 26555

~ Indicates test not carried out

Sample Identification		Orientation of Test	Dimension A	Dimension B	Load	Is	Corrected Is(50)	Comments
Exploratory Hole	Depth m							
			mm	mm	kN	MN/m ²	MN/m ²	
BH19	4.20-5.20	Axial	99.0	64.0	2.8	0.35	0.45	
BH19	4.20-5.20	Axial	99.0	46.0	3.1	0.53	0.65	
BH19	4.20-5.20	Axial	99.0	32.0	3.0	0.74	0.83	
BH19	4.20-5.20	Axial	99.0	45.0	1.5	0.26	0.32	
BH19	4.20-5.20	Axial	99.0	68.0	2.6	0.30	0.40	
BH19	4.20-5.20	Diametral	117.0	99.0	2.1	0.21	0.29	
BH19	4.20-5.20	Diametral	78.0	100.0	3.3	0.33	0.45	
BH19	4.20-5.20	Diametral	98.0	100.0	2.3	0.23	0.31	
BH19	4.20-5.20	Diametral	113.0	99.0	2.1	0.21	0.29	
BH19	4.20-5.20	Diametral	87.0	99.0	1.9	0.19	0.26	

Notes

1. Dimension A= Minimum Width for Lump Tests
Dimension A=Length for Diametral Tests
Dimension A=Diameter for Axial Tests
Dimension B=Platen Separation

2. Moisture Content of sample : saturated
3. All preparation and testing carried out in accordance with ISRM Commission on Testing Methods 1985
4. Opinions and interpretations are outside the scope of UKAS accreditation
5. Carried out parallel/perpendicular to bedding planes where obvious otherwise core shape used to determine orientation

Originator	Approved	POINT LOAD INDEX TESTS	
DW	CD 25/01/2024		



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH01	BH03	BH03	BH03
Depth	m	7.60-7.75	4.30-5.10	7.20-7.60	9.12-9.60
Date Received		08/01/2024	08/01/2024	08/01/2024	08/01/2024
Date Tested		12/01/2024	12/01/2024	12/01/2024	12/01/2024
Length	mm	111.8	203.5	128.9	212.6
Mean Diameter	mm	99.7	100.4	99.4	100.3
Length / Diameter Ratio		1.12	2.03	1.30	2.12
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0027	0.001	0.0019	0.0012
Bulk Density	Mg/m ³	2.09	2.48	2.58	2.53
Moisture Content	%	3.1	3.1	2.1	2.8
Degree of Saturation	%	Saturated	Saturated	Saturated	Saturated
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		2mins 27secs	2mins 3secs	2mins 42secs	5mins 35secs
Failure Load	kN	248.8	198.9	284.4	614
Uniaxial Compressive Strength	MPa	31.9	25.1	36.6	77.7
Type of Failure		Normal	Normal	Normal	Explosive
Strength Classification		Med strong	Med strong	Med strong	Strong
Associated Comment Numbers (see notes)		3		3	
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

Originator

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25/01/2024**UNIAXIAL COMPRESSIVE STRENGTH**

ASTM Methods





Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH03	BH04	BH04	BH04
Depth	m	10.65-10.93	5.93-6.10	7.50-7.80	9.95-10.10
Date Received		08/01/2024	08/01/2024	08/01/2024	08/01/2024
Date Tested		12/01/2024	12/01/2024	12/01/2024	12/01/2024
Length	mm	203.4	135.4	211	143.6
Mean Diameter	mm	100.4	100.5	100.3	100
Length / Diameter Ratio		2.03	1.35	2.10	1.44
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0014	0.003	0.0014	0.0017
Bulk Density	Mg/m ³	2.53	2.43	2.55	2.57
Moisture Content	%	3	3.1	3.1	2.1
Degree of Saturation	%	Saturated	Saturated	Saturated	Saturated
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		3mins 41secs	2mins 42secs	4mins 4secs	4mins 0secs
Failure Load	kN	383.7	288.7	432	440
Uniaxial Compressive Strength	MPa	48.5	36.4	54.7	56.0
Type of Failure		Explosive	Normal	Explosive	Normal
Strength Classification		Medium strong	Medium strong	Strong	Strong
Associated Comment Numbers (see notes)			3		3
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

Originator

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Approved

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25/01/2024**UNIAXIAL COMPRESSIVE STRENGTH**

ASTM Methods





Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH04	BH05	BH05	BH05
Depth	m	10.62-10.81	6.72-6.90	7.30-7.80	9.40-9.82
Date Received		08/01/2024	08/01/2024	08/01/2024	08/01/2024
Date Tested		12/01/2024	12/01/2024	12/01/2024	12/01/2024
Length	mm	184.7	140.8	218.3	204.7
Mean Diameter	mm	100.1	100.6	100.5	100.2
Length / Diameter Ratio		1.85	1.40	2.17	2.04
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0016	0.0018	0.0009	0.0015
Bulk Density	Mg/m ³	2.53	2.48	2.51	2.56
Moisture Content	%	2.8	2.5	2.4	2.4
Degree of Saturation	%	Saturated	Saturated	Saturated	Saturated
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		1min 7secs	3mins 20secs	4mins 19secs	4mins 24secs
Failure Load	kN	101.4	340.2	477	514
Uniaxial Compressive Strength	MPa	12.9	42.8	60.1	65.2
Type of Failure		Normal	Normal	Normal	Explosive
Strength Classification		Weak	Med strong	Strong	Strong
Associated Comment Numbers (see notes)		3,7	3		
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

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ASTM Methods





Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH05	BH06	BH06	BH07
Depth	m	10.05-10.32	5.40-5.60	7.05-7.50	5.10-5.30
Date Received		08/01/2024	08/01/2024	08/01/2024	08/01/2024
Date Tested		12/01/2024	12/01/2024	12/01/2024	12/01/2024
Length	mm	235.6	165.1	183.2	129.6
Mean Diameter	mm	100	102.9	102.8	100.4
Length / Diameter Ratio		2.36	1.60	1.78	1.29
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0013	0.0015	0.0016	0.0031
Bulk Density	Mg/m ³	2.53	2.55	2.51	2.51
Moisture Content	%	3	2.3	3.4	2.3
Degree of Saturation	%	Saturated	Saturated	Saturated	Saturated
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		3mins 44secs	3mins 28secs	2mins 9secs	3mins 58secs
Failure Load	kN	376.6	352.6	166	429
Uniaxial Compressive Strength	MPa	48.0	42.4	20.0	54.2
Type of Failure		Normal	Normal	Normal	Normal
Strength Classification		Med strong	Med strong	Weak	Strong
Associated Comment Numbers (see notes)			3	3	3
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
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9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH07	BH08	BH08	BH08
Depth	m	5.80-6.37	5.65-6.00	7.36-7.68	7.68-8.00
Date Received		08/01/2024	08/01/2024	08/01/2024	08/01/2024
Date Tested		14/01/2024	14/01/2024	14/01/2024	14/01/2024
Length	mm	209	196.8	204.8	210.9
Mean Diameter	mm	100.1	99.6	100.4	100.6
Length / Diameter Ratio		2.09	1.98	2.04	2.10
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0014	0.0013	0.0012	0.0019
Bulk Density	Mg/m ³	2.51	2.52	2.54	2.52
Moisture Content	%	1.7	2.5	1.7	1.4
Degree of Saturation	%	Saturated	Saturated	Saturated	Saturated
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		5mins 13secs	3mins 7secs	6mins 4secs	6mins 23secs
Failure Load	kN	529	374	638	779
Uniaxial Compressive Strength	MPa	67.2	48.0	80.6	98.0
Type of Failure		Normal	Normal	Normal	Normal
Strength Classification		Strong	Medium Strong	Strong	Strong
Associated Comment Numbers (see notes)			3		
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
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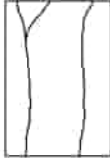
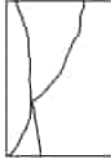




Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH09	BH09	BH09	BH10
Depth	m	3.38-3.59	4.38-4.70	6.20-6.90	5.30-5.50
Date Received		08/01/2024	08/01/2024	08/01/2024	08/01/2024
Date Tested		14/01/2024	14/01/2024	14/01/2024	14/01/2024
Length	mm	165.5	181.6	201.2	195.3
Mean Diameter	mm	100.2	100.1	100.2	99.4
Length / Diameter Ratio		1.65	1.81	2.01	1.96
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0018	0.0017	0.0012	0.002
Bulk Density	Mg/m ³	2.52	2.5	2.49	2.54
Moisture Content	%	2	2.2	1.9	1.4
Degree of Saturation	%	Saturated	Saturated	Saturated	Saturated
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		3mins 7secs	2mins 8secs	5mins 24secs	5ins 45secs
Failure Load	kN	296	210	558	643
Uniaxial Compressive Strength	MPa	37.5	26.7	70.8	82.9
Type of Failure		Normal	Normal	Normal	Normal
Strength Classification		Medium Strong	Medium Strong	Strong	Strong
Associated Comment Numbers (see notes)		3	3		3
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH10	BH11	BH12	BH12
Depth	m	8.00-8.50	5.00-5.40	3.35-3.50	6.10-6.35
Date Received		08/01/2024	08/01/2024	08/01/2024	08/01/2024
Date Tested		14/01/2024	14/01/2024	14/01/2024	14/01/2024
Length	mm	221	143	165.8	174.8
Mean Diameter	mm	99.4	103	100.6	100
Length / Diameter Ratio		2.22	1.39	1.65	1.75
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0018	0.0021	0.0018	0.0011
Bulk Density	Mg/m ³	2.49	2.54	2.43	2.53
Moisture Content	%	1.1	1.8	1.5	2.5
Degree of Saturation	%	Saturated	Saturated	Saturated	Saturated
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		6mins 43secs	4mins 41secs	5mins 13secs	2mins 48secs
Failure Load	kN	836	543	579	266
Uniaxial Compressive Strength	MPa	107.7	65.2	72.8	33.9
Type of Failure		Normal	Normal	Normal	Normal
Strength Classification		Very Strong	Strong	Strong	Medium Strong
Associated Comment Numbers (see notes)			3	3	3
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
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9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH13	BH14	BH14	BH15
Depth	m	7.50-7.65	6.48-6.76	7.20-7.90	6.50-6.78
Date Received		08/01/2024	08/01/2024	08/01/2024	08/01/2024
Date Tested		14/01/2024	14/01/2024	14/01/2024	14/01/2024
Length	mm	131.5	111.1	208.7	194.3
Mean Diameter	mm	99.2	100.1	100.2	99.6
Length / Diameter Ratio		1.33	1.11	2.08	1.95
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0023	0.0036	0.0014	0.0013
Bulk Density	Mg/m ³	2.42	2.55	2.55	2.52
Moisture Content	%	2.4	1.8	1.7	1.6
Degree of Saturation	%	Saturated	Saturated	Saturated	Saturated
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		2mins 57secs	4mins 23secs	4mins 29secs	5mins 17secs
Failure Load	kN	318	501	485	587
Uniaxial Compressive Strength	MPa	41.1	63.7	61.5	75.3
Type of Failure		Normal	Normal	Normal	Explosive
Strength Classification		Medium Strong	Strong	Strong	Strong
Associated Comment Numbers (see notes)		3	3		3
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
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ASTM Methods





Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH15	BH18	BH18	BH19
Depth	m	8.50-10.00	5.60-5.90	9.18-9.45	4.98-5.20
Date Received		08/01/2024	08/01/2024	08/01/2024	08/01/2024
Date Tested		15/01/2024	15/01/2024	15/01/2024	15/01/2024
Length	mm	220.1	199.7	150.2	170.9
Mean Diameter	mm	99.6	102.9	102.8	99.7
Length / Diameter Ratio		2.21	1.94	1.46	1.71
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0014	0.0013	0.0027	0.0018
Bulk Density	Mg/m ³	2.49	2.51	2.54	2.36
Moisture Content	%	1.5	1.5	1.8	2.1
Degree of Saturation	%	Saturated	Saturated	Saturated	Saturated
Stress Rate	MPa/sec	0.60	0.60	0.60	0.60
Test Duration		5mins 20secs	3mins 12secs	3mins 37secs	1min 37secs
Failure Load	kN	595	332.8	415	175.7
Uniaxial Compressive Strength	MPa	76.4	40.0	50.0	22.5
Type of Failure		Explosive	Normal	Normal	Normal
Strength Classification		Strong	Med strong	Strong	Weak
Associated Comment Numbers (see notes)			3	3	3,7
Failure Diagram					

Notes:

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2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No 26555

Exploration Point		BH19			
Depth	m	5.50-5.70			
Date Received		08/01/2024			
Date Tested		15/01/2024			
Length	mm	164			
Mean Diameter	mm	99.5			
Length / Diameter Ratio		1.65			
Straightness Compliance (see notes)	Y/N	Y			
Flatness Compliance (see notes)	Y/N	Y			
Perpendicularity	mm	0.0018			
Bulk Density	Mg/m ³	2.45			
Moisture Content	%	2.5			
Degree of Saturation	%	Saturated			
Stress Rate	MPa/sec	0.60			
Test Duration		3mins 9secs			
Failure Load	kN	334.3			
Uniaxial Compressive Strength	MPa	43.0			
Type of Failure		Normal			
Strength Classification		Strong			
Associated Comment Numbers (see notes)		3			
Failure Diagram					

Notes:

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
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Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH01
Sample Ref	
Depth (m)	7.60
Sample Type	C



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PHOTOGRAPHS OF SPECIMEN FAILURE





Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Hole ID BH03

Sample Ref

Depth (m) 4.30

Sample Type C



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PHOTOGRAPHS OF SPECIMEN FAILURE





Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH03
Sample Ref	
Depth (m)	7.20
Sample Type	C



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PHOTOGRAPHS OF SPECIMEN FAILURE



	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH03
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	9.12
			Sample Type	C



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			Sheet 1 of 1



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Hole ID BH03

Sample Ref

Depth (m) 10.65

Sample Type C



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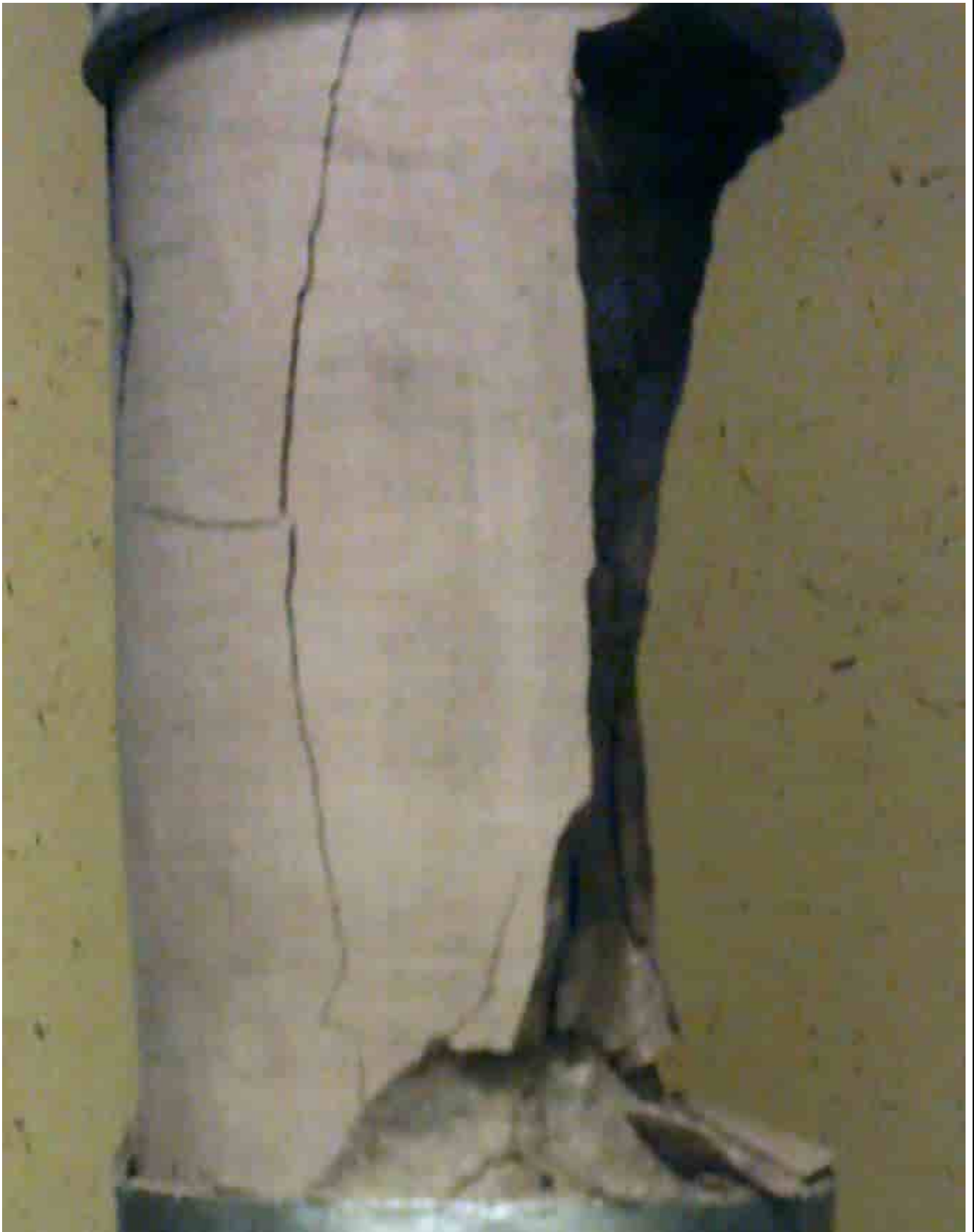
PHOTOGRAPHS OF SPECIMEN FAILURE





Site LT520 BRACO WEST SUBSTATION
Client SHE Transmission plc
Engineer SSE Perth Inveralmond HSE

Contract No **26555**
Hole ID BH04
Sample Ref
Depth (m) 5.93
Sample Type C



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PHOTOGRAPHS OF SPECIMEN FAILURE





Site LT520 BRACO WEST SUBSTATION

Contract No **26555**

Hole ID BH04

Client SHE Transmission plc

Sample Ref

Engineer SSE Perth Inveralmond HSE

Depth (m) 7.50

Sample Type C



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PHOTOGRAPHS OF SPECIMEN FAILURE





Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH04
Sample Ref	
Depth (m)	9.95
Sample Type	C



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PHOTOGRAPHS OF SPECIMEN FAILURE





Site LT520 BRACO WEST SUBSTATION

Contract No **26555**

Hole ID BH04

Client SHE Transmission plc

Sample Ref

Engineer SSE Perth Inveralmond HSE

Depth (m)

10.62

Sample Type C



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PHOTOGRAPHS OF SPECIMEN FAILURE





Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH05
Sample Ref	
Depth (m)	6.72
Sample Type	C



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PHOTOGRAPHS OF SPECIMEN FAILURE



	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH05
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	7.30
			Sample Type	C




Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	
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		Sheet 1 of 1	

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH05
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	9.40
			Sample Type	C




Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	
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		Sheet 1 of 1	

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH05
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	10.05
			Sample Type	C




Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	
DW	 25/01/2024		
		Sheet 1 of 1	

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH06
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	5.40
			Sample Type	C




Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	
DW	 25/01/2024		
		Sheet 1 of 1	

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH06
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	7.05
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	
DW	 25/01/2024		
			Sheet 1 of 1

	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH07
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	5.10
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	
DW	CD 25/01/2024		
			Sheet 1 of 1



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Hole ID BH07

Sample Ref

Depth (m) 5.80

Sample Type C



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Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH08
Sample Ref	
Depth (m)	5.65
Sample Type	C



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Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH08
Sample Ref	
Depth (m)	7.36
Sample Type	C



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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Hole ID BH08

Sample Ref

Depth (m) 7.68

Sample Type C



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Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Hole ID BH09

Sample Ref

Depth (m) 3.38

Sample Type C



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Site LT520 BRACO WEST SUBSTATION
Client SHE Transmission plc
Engineer SSE Perth Inveralmond HSE

Contract No **26555**
Hole ID BH09
Sample Ref
Depth (m) 4.38
Sample Type C



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Site LT520 BRACO WEST SUBSTATION

Contract No **26555**

Hole ID BH09

Client SHE Transmission plc

Sample Ref

Engineer SSE Perth Inveralmond HSE

Depth (m) 6.20

Sample Type C



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Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH10
Sample Ref	
Depth (m)	5.30
Sample Type	C



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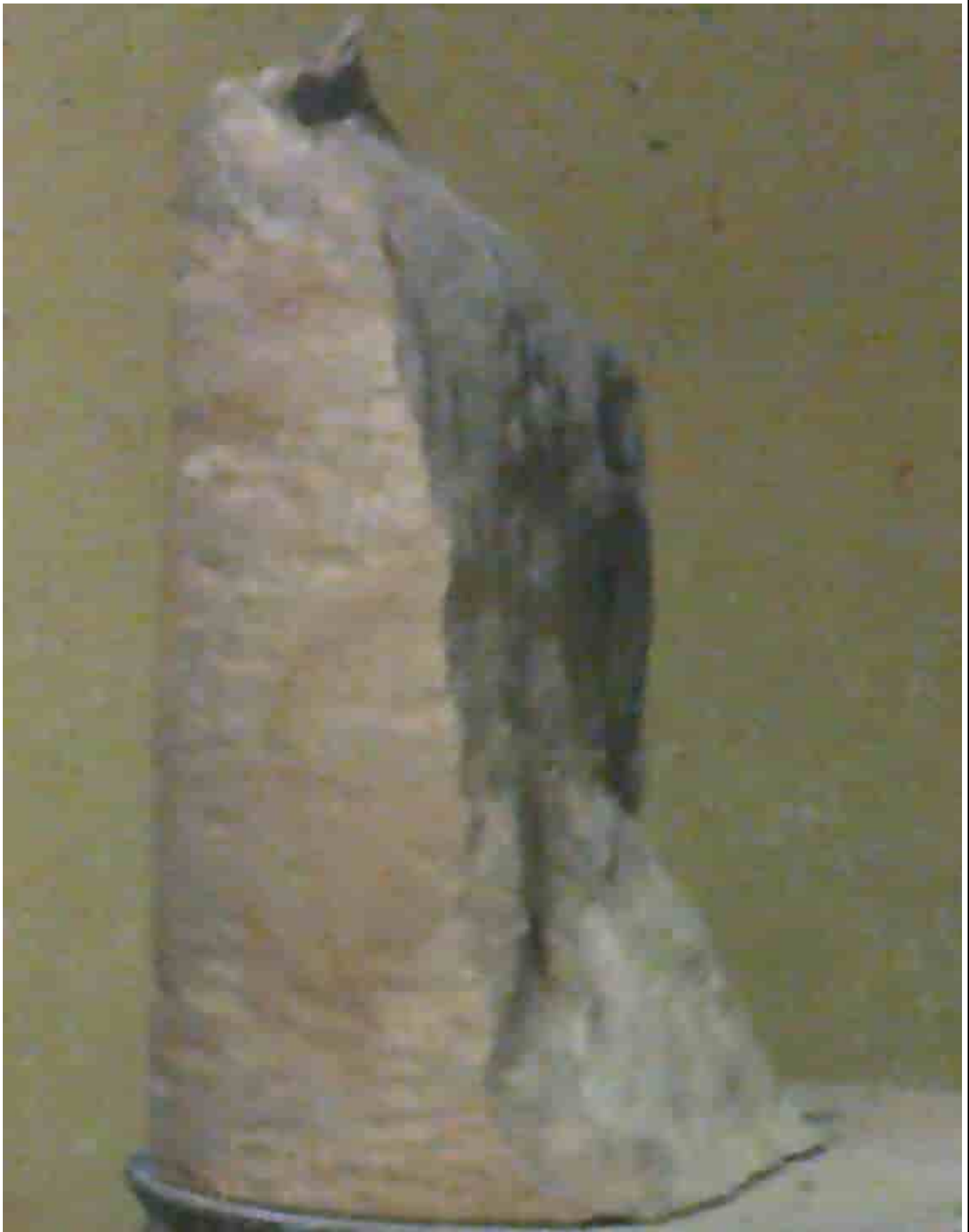
PHOTOGRAPHS OF SPECIMEN FAILURE





Site LT520 BRACO WEST SUBSTATION
Client SHE Transmission plc
Engineer SSE Perth Inveralmond HSE

Contract No **26555**
Hole ID BH10
Sample Ref
Depth (m) 8.00
Sample Type C



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Site LT520 BRACO WEST SUBSTATION

Contract No **26555**

Hole ID BH11

Client SHE Transmission plc

Sample Ref

Engineer SSE Perth Inveralmond HSE

Depth (m) 5.00

Sample Type C



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Site LT520 BRACO WEST SUBSTATION
Client SHE Transmission plc
Engineer SSE Perth Inveralmond HSE

Contract No **26555**
Hole ID BH12
Sample Ref
Depth (m) 3.35
Sample Type C



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	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH12
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	6.10
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	
DW	 25/01/2024		
			Sheet 1 of 1



Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH13
Sample Ref	
Depth (m)	7.50
Sample Type	C



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	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH14
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	6.48
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	
DW	 25/01/2024		
			Sheet 1 of 1



Site LT520 BRACO WEST SUBSTATION

Client SHE Transmission plc

Engineer SSE Perth Inveralmond HSE

Contract No **26555**

Hole ID BH14

Sample Ref

Depth (m) 7.20

Sample Type C



Originator


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25/01/2024

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	Site	LT520 BRACO WEST SUBSTATION	Contract No	26555
	Client	SHE Transmission plc	Hole ID	BH15
	Engineer	SSE Perth Inveralmond HSE	Sample Ref	
			Depth (m)	6.50
			Sample Type	C



Originator	Checked & Approved	PHOTOGRAPHS OF SPECIMEN FAILURE	
DW	CD 25/01/2024		
			Sheet 1 of 1



Site LT520 BRACO WEST SUBSTATION
Client SHE Transmission plc
Engineer SSE Perth Inveralmond HSE

Contract No **26555**
Hole ID BH15
Sample Ref
Depth (m) 8.50
Sample Type C



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Site LT520 BRACO WEST SUBSTATION

Contract No **26555**

Hole ID BH18

Client SHE Transmission plc

Sample Ref

Engineer SSE Perth Inveralmond HSE

Depth (m) 5.60

Sample Type C



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Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH18
Sample Ref	
Depth (m)	9.18
Sample Type	C



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PHOTOGRAPHS OF SPECIMEN FAILURE





Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH19
Sample Ref	
Depth (m)	4.98
Sample Type	C



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PHOTOGRAPHS OF SPECIMEN FAILURE





Site	LT520 BRACO WEST SUBSTATION
Client	SHE Transmission plc
Engineer	SSE Perth Inveralmond HSE

Contract No	26555
Hole ID	BH19
Sample Ref	
Depth (m)	5.50
Sample Type	C



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PHOTOGRAPHS OF SPECIMEN FAILURE





Site: LT520 BRACO WEST SUBSTATION

Contract No: 26555

Client: SHE Transmission plc

Engineer: SSE Perth Inveralmond HSE

Style: APPENDIX A File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:28:47 Raeburn Drilling and Geotechnical Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

APPENDIX G
GEOCHEMICAL TESTING RESULTS





Certificate of Analysis

Certificate Number 23-28085

Issued: 12-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-28085

Client Reference 26555

Order No (not supplied)

Contract Title LT520 BRACO WEST SUBSTATION

Description 13 Soil samples.

Date Received 29-Nov-23

Date Started 29-Nov-23

Date Completed 12-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

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

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28085

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	2269461	2269462	2269463	2269464	2269465	2269466
Sample ID	TP03	TP03	TP06	TP06	TP08	TP21
Depth	0.50	1.00	0.60	1.10	1.00	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	4.5	5.0	3.0	2.6	3.6	4.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	< 0.2	< 0.2	0.3	< 0.2	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	21	23	26	25	19	25
Copper	DETSC 2301#	0.2	mg/kg	8.0	9.6	12	11	7.1	12
Lead	DETSC 2301#	0.3	mg/kg	8.0	7.6	16	14	6.4	6.8
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	16	19	23	21	16	25
Zinc	DETSC 2301#	1	mg/kg	37	40	38	36	30	39
Inorganics									
pH	DETSC 2008#		pH	6.6	6.2	5.9	6.2	6.0	7.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.5	0.4	0.2	0.1	0.5	1.1
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l	51	24	12	10	16	11
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis Soil Samples

Our Ref 23-28085

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	2269461	2269462	2269463	2269464	2269465	2269466
Sample ID	TP03	TP03	TP06	TP06	TP08	TP21
Depth	0.50	1.00	0.60	1.10	1.00	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28085

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	2269467	2269468	2269469	2269470	2269471	2269472
Sample ID	TP21	TP21	TP23	TP23	TP23	TP22
Depth	1.00	1.50	0.30	0.90	1.25	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	2.0	3.6	4.6	5.7	6.7	3.1
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	0.3	< 0.2	< 0.2	< 0.2	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	19	24	30	25	34	33
Copper	DETSC 2301#	0.2	mg/kg	6.9	12	33	10	16	15
Lead	DETSC 2301#	0.3	mg/kg	6.1	7.3	18	7.6	11	12
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	15	21	28	20	30	26
Zinc	DETSC 2301#	1	mg/kg	26	36	51	38	55	43
Inorganics									
pH	DETSC 2008#		pH	5.9	6.3	6.8	6.0	6.0	6.3
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	0.2	0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	1.5	0.3	7.3	1.2	0.8	0.6
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	< 10	< 10	< 10	22	15	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis Soil Samples

Our Ref 23-28085

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

				Lab No	2269467	2269468	2269469	2269470	2269471	2269472
				Sample ID	TP21	TP21	TP23	TP23	TP23	TP22
				Depth	1.00	1.50	0.30	0.90	1.25	0.50
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023	21/11/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units							
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	0.7	0.4	0.6	0.7	

Figure G1

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28085

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	2269473
Sample ID	TP22
Depth	1.00
Other ID	
Sample Type	SOIL
Sampling Date	21/11/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	6.4
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	37
Copper	DETSC 2301#	0.2	mg/kg	23
Lead	DETSC 2301#	0.3	mg/kg	12
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	35
Zinc	DETSC 2301#	1	mg/kg	60
Inorganics				
pH	DETSC 2008#		pH	6.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.8
Organic matter	DETSC 2002#	0.1	%	< 0.1
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l	< 10
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10
PAHs				
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1

Figure G1

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis Soil Samples

Our Ref 23-28085

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	2269473
Sample ID	TP22
Depth	1.00
Other ID	
Sample Type	SOIL
Sampling Date	21/11/2023
Sampling Time	n/s

Test	Method	LOD	Units	
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.3

Figure G1

Summary of Asbestos Analysis Soil Samples

Our Ref 23-28085

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2269461	TP03 0.50	SOIL	NAD	none	Robertas Ciparis
2269462	TP03 1.00	SOIL	NAD	none	Robertas Ciparis
2269463	TP06 0.60	SOIL	NAD	none	Robertas Ciparis
2269464	TP06 1.10	SOIL	NAD	none	Robertas Ciparis
2269465	TP08 1.00	SOIL	NAD	none	Robertas Ciparis
2269466	TP21 0.50	SOIL	NAD	none	Robertas Ciparis
2269467	TP21 1.00	SOIL	NAD	none	Robertas Ciparis
2269468	TP21 1.50	SOIL	NAD	none	Robertas Ciparis
2269469	TP23 0.30	SOIL	NAD	none	Robertas Ciparis
2269470	TP23 0.90	SOIL	NAD	none	Robertas Ciparis
2269471	TP23 1.25	SOIL	NAD	none	Robertas Ciparis
2269472	TP22 0.50	SOIL	NAD	none	Robertas Ciparis
2269473	TP22 1.00	SOIL	NAD	none	Robertas Ciparis

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

Information in Support of the Analytical Results

Our Ref 23-28085
 Client Ref 26555
 Contract LT520 BRACO WEST SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2269461	TP03 0.50 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269462	TP03 1.00 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269463	TP06 0.60 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269464	TP06 1.10 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269465	TP08 1.00 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269466	TP21 0.50 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269467	TP21 1.00 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269468	TP21 1.50 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269469	TP23 0.30 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269470	TP23 0.90 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269471	TP23 1.25 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269472	TP22 0.50 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2269473	TP22 1.00 SOIL	21/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	

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

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

Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report



Certificate of Analysis

Certificate Number 23-28676

Issued: 19-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-28676

Client Reference 26555

Order No (not supplied)

Contract Title LT520 BRACO WEST SUBSTATION

Description 3 Soil samples.

Date Received 06-Dec-23

Date Started 06-Dec-23

Date Completed 19-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

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

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-28676

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	2272643	2272644	2272645
Sample ID	TP10	TP10	TP20
Depth	1.40	2.10	1.40
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	28/11/2023	28/11/2023	28/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	8.0	7.9	2.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	33	31	31
Copper	DETSC 2301#	0.2	mg/kg	19	23	17
Lead	DETSC 2301#	0.3	mg/kg	10	9.6	10
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	28	28	25
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	60	58	49
Inorganics						
pH	DETSC 2008#		pH	5.3	5.6	5.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.5	1.4	0.5
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	18	< 10	< 10
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	3.3	2.4	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	5.3	2.3	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	8.1	3.1	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	4.3	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	21	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	21	< 10	< 10
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis Soil Samples

Our Ref 23-28676

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	2272643	2272644	2272645
Sample ID	TP10	TP10	TP20
Depth	1.40	2.10	1.40
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	28/11/2023	28/11/2023	28/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

Summary of Asbestos Analysis Soil Samples

Our Ref 23-28676

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2272643	TP10 1.40	SOIL	NAD	none	Barry Kelly
2272644	TP10 2.10	SOIL	NAD	none	Barry Kelly
2272645	TP20 1.40	SOIL	NAD	none	Barry Kelly

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

Information in Support of the Analytical Results

Our Ref 23-28676
 Client Ref 26555
 Contract LT520 BRACO WEST SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled			
2272643	TP10 1.40 SOIL	28/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2272644	TP10 2.10 SOIL	28/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2272645	TP20 1.40 SOIL	28/11/23	GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	

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

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

Soil Analysis Notes

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

Disposal

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

End of Report



Certificate of Analysis

Certificate Number 23-28678

Issued: 19-Dec-23

Client Raeburn Drilling
East Avenue
Blantyre
Glasgow
G72 0JB

Our Reference 23-28678

Client Reference 26555

Order No (not supplied)

Contract Title LT520 BRACO WEST SUBSTATION

Description 3 Soil samples, 2 Leachate prepared by DETS samples.

Date Received 06-Dec-23

Date Started 06-Dec-23

Date Completed 19-Dec-23

Test Procedures Identified by prefix DETSn (details on request).

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

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



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Summary of Chemical Analysis

Soil Samples

Our Ref 23-28678

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	2272651	2272652	2272653
Sample ID	TP05	TP09	TP09
Depth	2.00	0.50	1.00
Other ID			
Sample Type	ES	ES	ES
Sampling Date	27/11/2023	27/11/2023	27/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	3.1	2.2	2.7
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	25	28	35
Copper	DETSC 2301#	0.2	mg/kg	17	14	26
Lead	DETSC 2301#	0.3	mg/kg	9.0	8.2	8.2
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	22	26	31
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	42	51	48
Inorganics						
pH	DETSC 2008#		pH	5.5	5.3	5.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	1.0	0.7	< 0.1
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l	< 10	< 10	< 10
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1

Figure G3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis Soil Samples

Our Ref 23-28678

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	2272651	2272652	2272653
Sample ID	TP05	TP09	TP09
Depth	2.00	0.50	1.00
Other ID			
Sample Type	ES	ES	ES
Sampling Date	27/11/2023	27/11/2023	27/11/2023
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 23-28678

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Sample Id TP09 1.00

Sample Numbers 2272653 2272967 2272968

Date Analysed 15/12/2023

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste		
DETSC 2084# Total Organic Carbon	%	< 0.5	3	5	6		
DETSC2003# Loss On Ignition	%		n/a	n/a	10		
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a		
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a		
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a		
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a		
DETSC2008# pH	pH Units		n/a	>6	n/a		
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE		
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE		

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	3	0.56	0.006	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	1.1	1.1	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.87	0.5	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	830	490	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	1100	1500	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	8300	10000	16.6	97.2	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	3100	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	8.1	7.6
DETSC 2009 Conductivity uS/cm	11.9	14.7
* Temperature*	16.0	16.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.122

Stage 1

Volume of Leachant L2*	0.225
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.973
Volume of Eluate VE2*	0.92

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis Soil Samples

Our Ref 23-28678

Client Ref 26555

Contract Title LT520 BRACO WEST SUBSTATION

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2272651	TP05 2.00	SOIL	NAD	none	Barry Kelly
2272652	TP09 0.50	SOIL	NAD	none	Barry Kelly
2272653	TP09 1.00	SOIL	NAD	none	Barry Kelly

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

Information in Support of the Analytical Results

Our Ref 23-28678
 Client Ref 26555
 Contract LT520 BRACO WEST SUBSTATION

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2272651	TP05 2.00 SOIL	27/11/23		GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2272652	TP09 0.50 SOIL	27/11/23		GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2272653	TP09 1.00 SOIL	27/11/23		GJ 60ml x2, PT 1L x2	pH + Conductivity (7 days)	
2272967	TP09 1.00 LEACHATE	27/11/23		GJ 60ml x2, PT 1L x2		
2272968	TP09 1.00 LEACHATE	27/11/23		GJ 60ml x2, PT 1L x2		

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

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

Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report



Site: LT520 BRACO WEST SUBSTATION

Contract No: 26555

Client: SHE Transmission plc

Engineer: SSE Perth Inveralmond HSE

Style: APPENDIX A File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:29:25 Raeburn Drilling and Geotechnical Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

APPENDIX H
CALIBRATION TESTING CERTIFICATES





SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Raeburn Drilling & Geotechnical
Whistleberry road
Hamilton
ML3 0HP

SPT Hammer Ref: RD48 2023
 Test Date: 31/03/2023
 Report Date: 31/03/2023
 File Name: RD48 2023.spt
 Test Operator: KS

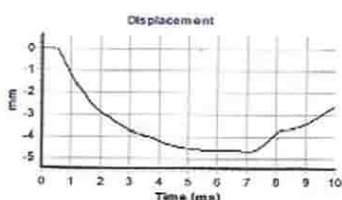
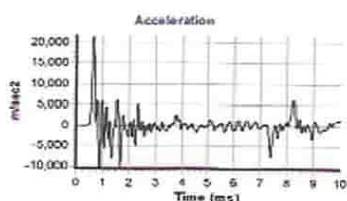
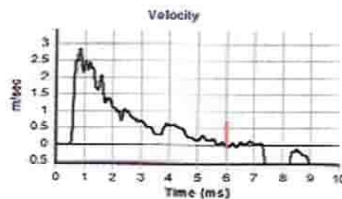
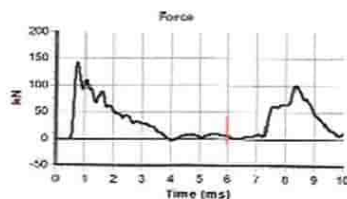
Instrumented Rod Data

Diameter d_r (mm): 54
 Wall Thickness t_r (mm): 6.9
 Assumed Modulus E_a (GPa): 208
 Accelerometer No.1: 69559
 Accelerometer No.2: 69560

SPT Hammer Information

Hammer Mass m (kg): 63.5
 Falling Height h (mm): 760
 SPT String Length L (m): 14.0

Comments / Location



Calculations

Area of Rod A (mm²): 1021
 Theoretical Energy E_{theor} (J): 473
 Measured Energy E_{meas} (J): 308

Energy Ratio E_r (%): **65**

The recommended calibration interval is 12 months

Signed: Kevin Steele
 Title: Head Storeman

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SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Raeburn Drilling & Geotechnical
Whistleberry road
Hamilton
ML3 0HP

SPT Hammer Ref: RD54 23
Test Date: 05/05/2023
Report Date: 05/05/2023
File Name: RD54 23.spt
Test Operator: K STEELE

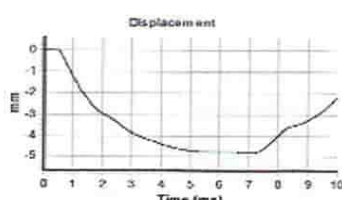
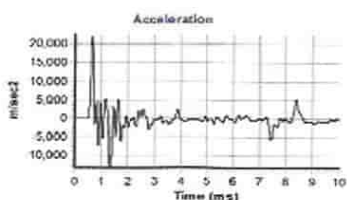
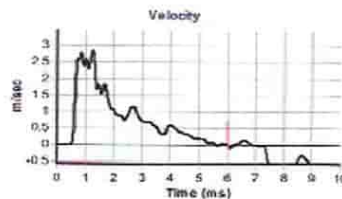
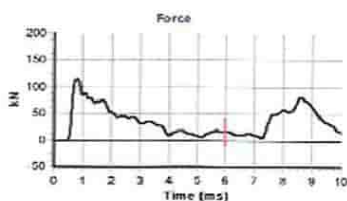
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.9
Assumed Modulus E_0 (GPa): 208
Accelerometer No.1: 69559
Accelerometer No.2: 69560

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 14.5

Comments / Location



Calculations

Area of Rod A (mm^2): 1021
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 304

Energy Ratio E_r (%): **64**

The recommended calibration interval is 12 months

Signed: Kevin Steele
Title: Head Storeman

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SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Raeburn Drilling & Geotechnical
Whistleberry road
Hamilton
ML3 0HP

SPT Hammer Ref: RD70 2023
Test Date: 15/02/2023
Report Date: 15/02/2023
File Name: RD70 2023.spt
Test Operator: KS

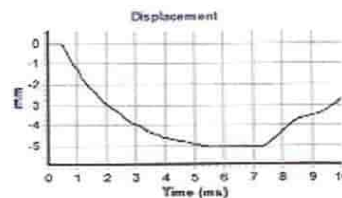
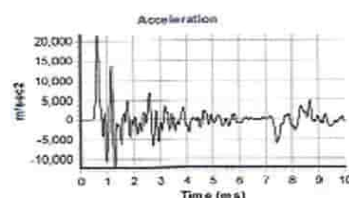
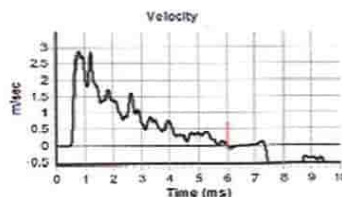
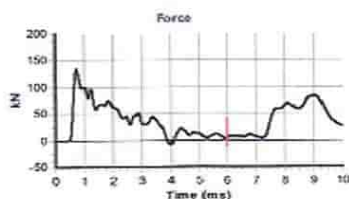
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.8
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 69559
Accelerometer No.2: 69560

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 14.5

Comments / Location



Calculations

Area of Rod A (mm²): 1008
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 331

Energy Ratio E_r (%): 70

The recommended calibration interval is 12 months

Signed: Kevin Steele
Title: Head Storeman

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Thermtest
INSTRUMENTS

Thermtest Inc.
25 Millennium Dr., Unit 2
Hamwell, NB, E3C 2N9
Canada

QC Certificate – TLS 100mm ASTM D5334-22a

UNIT	TLS 100mm
SENSOR SERIAL #	27103-454
CONTROLLER SERIAL #	30101-378
HARDWARE REV.	5
FIRMWARE VERSION*	1.7.9.54

*For accurate results, firmware version must be equal to or newer than the listed firmware

Verification measurements:

After calibration, agar, a polymer and a Macor sample were used for verification. Three measurements were taken at room temperature, with thermal paste to ensure proper contact between the sensor and the sample. The TLS 100mm sensor is specified to record thermal conductivity with 5% accuracy and 2% repeatability. The results can be seen below:

Polymer Verification Sample #1631, Batch #53:

Mean ambient temperature (°C)	23.7
Average measured thermal conductivity (W/m-K)	0.326
Known value at room temperature (W/m-K)	0.320
Accuracy	1.74 %
Relative standard deviation	1.37 %

Macor Verification Sample:

Mean ambient temperature (°C)	22.9
Average measured thermal conductivity (W/m-K)	1.600
Known value at room temperature (W/m-K)	1.640
Accuracy	2.44 %
Relative standard deviation	0.09 %

Certification:

This instrument is certified to have performed according to specifications.

Date: July 11th, 2023

Signed by: ETL SEAL
Quality Control Technician

Thermtest Inc.
Copyright © 2022

TLS 100mm-QC
Page: 1



Site: LT520 BRACO WEST SUBSTATION	Contract No: 26555
Client: SHE Transmission plc	
Engineer: SSE Perth Inveralmond HSE	

Style: APPENDIX A File: P:\GINTW\PROJECTS\26555.GPJ Printed: 25/01/2024 18:30:16 Raeburn Drilling and Geotechnical Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries@raeburndrilling.com

APPENDIX I
ECOLOGICAL REPORT



Achille
Igne Ltd.
Whistleberry Road
Blantyre
Hamilton
ML3 0HP

Our ref 179147/JG/001
Telephone 0141 378 6248
E-mail Adarling@envirocentre.co.uk

6 November 2023

Dear Achille

**Braco West Substation
Pre-Works Site Walkover Survey**

A pre-works site walkover survey was undertaken at the site known as Braco West Substation in Dunblane. The survey was carried out to inform upcoming ground investigation works for a proposed new substation in regards to any potential impacts the works will have on protected species or habitats within the site.

The results of the survey found no diagnostic evidence of protected species on site; however, observations of red fox, red deer, and roe deer were noted via scat and tracks throughout the site. The report provided within this letter provides recommendations for any impact avoidance and mitigation for the proposed works.

Yours sincerely
for EnviroCentre Limited

(issued electronically)

**Alexandra Darling Bsc(Hons) MRes
Graduate Ecologist**

**Gemma Nixon MSc CEcol MCIEEM
Lead-Principal Ecologist**

Enc: Braco West Substation Pre-Works Site Walkover Survey
Appendix: Summary of Protected Species Legislation

BRACO WEST SUBSTATION PRE-WORKS SITE WALKOVER SURVEY

Introduction

EnviroCentre Ltd. were commissioned by Igne Ltd., on 30th October 2023 to conduct a pre-works site walkover survey on 2nd November 2023 at a site known as Braco West Substation, to inform upcoming works on the site.

The proposed works are to include ground investigation works including sonic rig boreholes, boreholes, and trial pits, for a new 400kV substation which is to be built next to the current Braco West Substation, approximately (c.) 3.8km west of the village of Braco, Dunblane.

Site Description

The site is located around Feddal Hill and Cambushinnie Hill, c. 3.8km west of the village of Braco, which is c. 8.3km north of Dunblane.

The current site plan includes two option areas – Site 2 centred at c. NN 791089 and Site 3 centred at c. NN 787091. A main access track runs between the two site options, and along the western site boundary. The existing Braco West Substation is located 300m northeast of the proposed site.

The proposed site comprises of forestry land with mature conifer plantation to the west (included in Site 3) and semi-mature and young conifer plantation covering the east (included in Site 2). Areas of felled trees are also present in both site options.

Report Usage

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

If this report is to be submitted for regulatory approval more than 12 months following the report date, it is recommended that it is referred to EnviroCentre Limited for review to ensure that any relevant changes in data, best practice, guidance, or legislation in the intervening period are integrated into an updated version of the report.

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Field Survey

Field work was undertaken by EnviroCentre Ecologist Alexandra Darling on 2nd November 2023. Weather conditions during the survey were cloudy with an average temperature of 7°C.

The walkover survey was designed using the guidelines endorsed by NatureScot and CIEEM¹ and focussed on protected species which would most likely utilise the habitats which comprise the landscape in and around the site. Notable plants, including Invasive Non-Native Species, and habitats were also considered during the survey.

Assessment of the site for a range of protected species was undertaken and noted that red squirrel (*Sciurus vulgaris*), pine marten (*Martes martes*), birds, amphibians, and invertebrates have potential to utilise the site and surrounding habitat. Legislation pertaining to these species is present in Appendix A.

Red Squirrel

A survey was undertaken based on best practice guidance² which involves a search of suitable habitat (primarily coniferous woodland) for two distinct signs of squirrel activity. It should be noted that neither of these methods accurately distinguishes between red or grey squirrels (*Sciurus carolinensis*).

- Drey count – dreys are the nests made by both species of squirrel in trees. Dreys are distinguishable from birds' nests as they are normally 50cm in diameter and 30cm deep, comprise a ball shape and are usually densely constructed. The dreys are normally located close to the main stem of the tree at a height of 3m or more; and
- Feeding evidence – where cone producing trees (conifers) are evident evidence of squirrel feeding is searched for. Although the two species of squirrel cannot be distinguished from feeding remains, the manner in which squirrels break open seeds and nuts, which are then left on the forest floor, is diagnostic.

Pine Marten

A passive sign survey was conducted for pine marten according to standard guidance³. The survey included a search for scats (e.g. on prominent features such as tree stumps, dead logs or stones), footprints and identification of any potential den sites (elevated tree cavities and between rocks or crags) as well as the presence of scats on paths, rides and track ways through woodland or rock habitats.

An assessment of the habitat was also undertaken to identify likely prey resources, which include small mammals, birds and invertebrates, and potential resting sites and commuting opportunities.

It should be noted that in areas where pine marten populations are sparse and territorial defence is relatively unimportant, searches for signs (incl. scats) may fail to detect presence simply because the animals are less likely to deposit scats as territory markers; in such situation most scats are deposited at den sites and in foraging areas.

Birds

Habitats within the survey area were assessed for their suitability to support breeding and over wintering birds. Observations of birds were noted during the survey.

Observations of birds were also noted during the survey including incidental records of the following:

- Birds present – nesting or foraging on-site, flying over site, or corpses.
- Pellets/droppings.
- Nests – within trees or in ground vegetation.
- Eggs – intact/broken or within nest/below nest.
- Feathers – adult or natal down.

¹ CIEEM (2017) *Guidelines for Preliminary Ecological Appraisal*. 2nd edition. Available at: <https://cieem.net/resource/guidance-on-preliminary-ecological-appraisal-gpeal/>

² Gurnell, J., Lurz, P., McDonald, R. & Pepper, H. (2009) *Practical Techniques for surveying and monitoring squirrels*. Forestry Commission Practice Note 11.

³ Birks, J. (2012) Pine marten. In: Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trehwella, W.J., Wells, D. and Wray, S. (2012). *UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation*. The Mammal Society, Southampton

Amphibians

Guidance^{4,5} was used to identify direct evidence of amphibians and to assess the suitability of the habitats for common toad as follows:

- Direct sightings (including spawn, tadpoles, young and adult amphibians).
- Suitable aquatic habitat: medium (10 – 100m²) or large (> 100m²) ponds, on or within 500m of the site.
- Suitable terrestrial habitat: lightly grazed pasture, scrub, open woodland, gardens, and moors.
- Connectivity to additional suitable aquatic and terrestrial habitat.
- Foraging resources, for example, invertebrates.
- Hibernation sites – usually below ground systems that are protected against weather and predators.

Invertebrates

A general habitat suitability survey was made of the site its suitability to host invertebrate species.

UK Habitat Classification Survey

A UK Habitat Classification (UKHab) Survey was carried out in accordance with the user manual⁶. UKHab is a hierarchical system for rapidly recording and classifying habitat via satellite imagery and field survey. The system comprises 5 levels of Primary Habitats which include ecosystems, broad habitats, priority habitats and Annex I habitats, along with non-hierarchical secondary codes which provide information on the environment, management, and origin of Primary Habitats. The secondary codes are also used to identify notable species features. The information collected is used to identify ecologically sensitive features and recommend mitigation and enhancement measures in connection with a proposed development.

The surveyor utilised the UKHab Professional edition and aimed to categorise habitats up to level 5. Where the level 5 habitat could not be determined or is not reflective of the habitat type due to a lack of indicative species, habitats were categorised to level 4 or the broader level 3 habitat.

The information is used to identify ecologically sensitive features/habitats, inform relevant species surveys and, aid in the recommendation of mitigation and enhancement measures in connection with a proposed development.

Invasive Non-Native Species (INNS)

The survey included a check for the presence of any invasive non-native species (INNS) including but not limited to the following:

- Japanese knotweed (*Reynoutria japonica*).
- Giant hogweed (*Heracleum mantegazzianum*).
- Himalayan balsam (*Impatiens glandulifera*).

Constraints

Due to the nature of conifer plantations, the dense structure of the canopy made it difficult to assess the area for signs of protected species due to reduced visibility. However, the constraint is not considered to be of significant impact to have resulted in the misidentification of protected species within the site boundary.

⁴ McInerny, C. & Minting, P. (2016) *The Amphibians and Reptiles of Scotland*.

⁵ Beebee TJC, Griffiths RA (2000) *Amphibians and reptiles*. HarperCollins, vol 270. New Naturalist, London

⁶ UKHAB Ltd (2023). UK Habitat Classification Version 2.0 (Available at <https://www.ukhab.org>)

Due to the time of survey, many flowering plant species had likely died back, not allowing for full identification for some species resulting in plants being identified at genus or family level as opposed to species level. Although, the constraint is not considered to be of significant impact to have resulted in misclassification of broad habitats.

Results

Protected Species

No diagnostic evidence of any protected species was noted during the site visit. However, evidence of red fox (*Vulpes vulpes*), red deer (*Cervus elaphus*), and roe deer (*Capreolus capreolus*) were observed via tracks and scat present across the site.

Various bird species were also observed during the survey and are detailed in Table 1-1 below.

Table 1-1: Bird Species Observed on Site, November 2023

Common Name	Latin Name	Designation
Wood Pigeon	<i>Columba paumbus</i>	BOCC – Amber List
Wren	<i>Troglodytes troglodytes</i>	
Blackbird	<i>Turdus merula</i>	BOCC – Green List
Buzzard	<i>Buteo buteo</i>	
Chaffinch	<i>Fringilla coelebs</i>	
Great Tit	<i>Parus major</i>	
Raven	<i>Corvus corax</i>	
Red Kite	<i>Milvus milvus</i>	
Ring-Necked Pheasant	<i>Phasianus colchicus</i>	
Robin	<i>Erithacus rubecula</i>	

Although site observations were not recorded during the survey, suitable habitat also exists on site for red squirrel, pine marten, amphibians, and invertebrates. The coniferous trees offer nesting opportunities for squirrels, pine marten and birds, whilst the open areas where the plantation has been previously clear-felled, and vegetation has re-established, offers foraging opportunities for a range of wildlife.

The waterlogged bogs and artificially created drains across the site also provide suitable aquatic environments for amphibians and invertebrates, which in turn provides prey resources for species such as pine marten and foxes.

Habitats

The site comprised of primarily conifer plantation (UKHAB primary code w2c – other coniferous woodland; secondary code 29 - plantation). A range of mature to semi-mature and young trees were found predominantly to the west of the site whilst areas of clear-fell were found primarily to the east.

The British Geological survey (BGS) map⁷ indicates that peat lies beneath the majority of the site and Scotland's Environment Map⁸ shows that the site has underlying blanket bog. During the site visit it was confirmed that there are areas of waterlogged bog and underlying peat across the site, primarily in the open areas bordering the mature plantation to the west. *Sphagnum* mosses dominate the wet and waterlogged bogs with abundant heather (*Erica* spp.) and rushes (*Juncus* spp.) also present alongside grasses such as purple moor grass (*Molinia caerulea*).

The bogs on site have been disrupted by human activity through plantation and changes to the structure of the bog have occurred in some areas. However, the abundance of *Sphagnum* mosses still

⁷ British Geological Survey (2023). BGS Geology Viewer Map. Available at: <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/>

⁸ Scotland's Environment Map (No date). Carbon and Peatland 2016. Available at: Map | Scotland's environment web

present highlight that the bog has not yet become degraded as a result of such activities. Therefore, the bog on site has been classified as blanket bog (UKHAB primary code f1a; secondary code 57 - peat).

Blanket bogs are listed on Annex I of the Habitats Directive which have been designated as Special Areas of Conservation. Blanket bogs are also listed on the Scottish Biodiversity List as a habitat of principal importance for biodiversity conservation in Scotland.

INNS

No INNS were noted within the site boundary.

Assessment and Recommendations

The results of the survey indicate that the site is utilised by red fox, red deer, roe deer, and a variety of bird species. Whilst no diagnostic evidence was observed on site, suitable habitat also exists for red squirrel, pine marten, amphibians, and invertebrates.

The works are scheduled for winter months which are outwith the breeding season for red squirrel, pine marten, birds, deer, fox, and other protected species which may be utilising the site. Should work be delayed or extend to March when breeding, nesting, and birthing begins for wildlife⁹, this assessment will require review. If the survey is delayed or extended, further surveys may be required at additional costs, as per the proposal provided 31st October 2023.

In summary, the proposed locations of the ground investigation works within the Braco West Substation site are considered to be suitable with no ecological constraints currently present within these locations, providing that the mitigation recommendations are followed.

Mitigation

The presence of machinery, vehicles, site worker amenities, and increased human presence as a result of the works will cause disturbance to wildlife within the site, and the locale. Therefore, it is essential that the following mitigation recommendations are followed to prevent and/or minimise any potential impacts of the proposed works on protected species and wildlife within the locale:

- A toolbox talk to be provided to all personnel providing information of protected species and appropriate mitigation to be implemented prior to commencement.
- Care must be taken during planned clearance/felling of trees required for access to ensure wildlife is not harmed.
- In the event any protected species are found when the ecologist is not in attendance, works must stop, the animal must not be handled, and the project ecologist contacted immediately.
- Any temporary lighting used during the works should be designed to be 'wildlife friendly' and should not illuminate commuting, foraging or sheltering habitats such as woodland, both on-site and in the surrounding area. Low- or high-pressure sodium lamps instead of mercury and metal halide lamps are preferred for their UV filtering properties, reducing light spillage and pollution.
- Any excavations created during works should not be left open for animals to fall into. Appropriate covers should be fitted at the end of every working day, at the very least, a shallow sloping edge or some form of ramp should be placed in the excavations to allow any animals to climb out.

⁹ Timing of breeding/nesting/birthing varies dependent on species.

- Bog mats should be used to avoid damaging the habitats and surrounding environment. The mats will also provide easier access for machinery/vehicles within the waterlogged and soft ground areas.

Future Recommended Works

Ecological data is typically considered valid for 12 months; however, due to the nature of , then updated surveys would be required if the proposed works, specifically associated with the water abstraction point, are not completed by late March 2024.

If any changes are made to the site boundary plan, or additional areas are to be included as part of the proposed works, further checks for protected species within newly proposed areas should be undertaken by an ecologist.

APPENDIX A

Summary of Protected Species Legislation

Red Squirrel and Pine Marten

Red squirrel and pine marten are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Subject to certain exceptions, it is an offence to intentionally or recklessly:

- kill, injure, or take (capture) an individual.
- damage, destroy or obstruct access to any structure or place which they use for shelter or protection.
- disturb an individual while it is occupying a structure or place which it uses for that purpose.
- possess or control, sell, offer for sale, or possess or transport for the purpose of sale any live or dead animal or any derivative of such an animal.

Knowingly causing or permitting any of the above acts to be carried out is also an offence.

In some cases, licenses may be issued by NatureScot to enable certain otherwise illegal activities to take place for social, economic, or environmental reasons (including development) as long as:

- the licensed activity will contribute to significant social, economic, or environmental benefit.
- there is no satisfactory alternative.
- there will be no significant negative impact on the conservation status of the species.

Birds

All wild bird species in the UK are protected under the Wildlife and Countryside Act 1981 (as amended), with species listed on Schedules A1, 1 and 1A afforded additional protection.

For any wild bird species, it is an offence to intentionally or recklessly:

- kill, injure, or take a bird.
- take, damage, destroy or interfere with a nest of any bird while it is in use or being built.
- obstruct or prevent any bird from using its nest.
- take or destroy an egg of any bird.
- possess or control a living or dead wild bird.
- possess or control an egg of a wild bird (or any such derivatives).

For any wild bird species listed on Schedule 1, it's an offence to disturb:

- any bird while it is building a nest.
- any bird while it is in, on, or near a nest containing eggs or young.
- any bird while lekking.
- the dependent young of any bird.

For any wild bird species listed on Schedule 1A, it's an offence to intentionally or recklessly harass any bird.

For any wild bird species listed on Schedule A1, it's an offence to intentionally or recklessly take, damage, destroy or interfere at any time with a nest habitually used by any bird.

Licences cannot be issued for the purpose of development in relation to any of the above offences.

Deer and Red Fox

All deer species and red fox have basic protection from cruelty under the Wild Mammals Protection Act 1996 and Animal Welfare Act 2006. This makes it an offence to harm a wild mammal with intent to inflict unnecessary suffering.

Invasive Non-Native Species (Plants)

Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to plant, or otherwise cause to grow, any plant in the wild at a location outside its native range.

‘Native range’ is defined in the 1981 Act as, “the locality to which the animal or plant of that type is indigenous and does not refer to any locality to which that type of animal or plant has been imported (whether intentionally or otherwise) by any person.”

The Scottish Governments Non-natives Code of Practice¹⁰ defines ‘in the wild’. Just about everywhere is wild except for:

- arable and horticultural land
- improved pasture
- settlements; and
- private and public gardens.

In exceptional circumstances it may be possible to obtain a licence from NatureScot to permit the above offence

¹⁰ <https://www.gov.scot/publications/non-native-species-code-practice/>