BALFOUR BEATTY

PROPOSED CAMBUSHINNIE 400Kv SUBSTATION
HAUL ROAD, CAMBUSHINNIE
PERTH AND KINROSS

REPORT ON GROUND INVESTIGATION

Client:
Balfour Beatty
Maxim 7
Maxim Office Park
Parklands Avenue
Eurocentral
ML1 4WQ

Contract Number: 26786

Date of Issue: 13 December 2024

Report Issue: Draft

Report Type: Factual

Raeburn Drilling & Geotechnical Limited trading as Igne.
Whistleberry Road, Hamilton ML3 0HP
Registered in Scotland No. 00094320

PROPOSED CAMBUSHINNIE 400Kv SUBSTATION
HAUL ROAD, CAMBUSHINNIE
PERTH AND KINROSS

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C J Husbands	Principal Geochemist	13 December 2024
Checked & Approved:	……	
FM Raeburn	Chief Engineer	13 December 2024

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

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REPORT ON GROUND INVESTIGATION

Contract No. 26762 **13 December 2024**

1. INTRODUCTION

It is proposed to construct a new 400kV substation at Cambushinnie, immediately west of the existing Braco 275kV substation. Associated with the development is a haul road between Easter Feddal and the A822, via the B8033. On the instructions of Balfour Beatty and to the specification of the Designer WSP, an investigation was carried out to provide information on the ground conditions for design and construction of the proposed works and in relation to 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 comprises a liner route between the A822 at approximate national grid reference NN836090 and Gamekeeper's Cottage at Easter Feddal (approximate National Grid reference NN824092).

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 15 to 25 October 2024, 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.

Two boreholes (Nos. BH01 and BH02) were sunk by rota-sonic and core drilling methods and a further seven (Nos. WS01 to WS07) were undertaken using continuous percussion boring. In addition, twenty-two trial pits (Nos. TP01 to TP22) were excavated by machine. Lastly, four pavement cores were undertaken where the route crossed tarmacked roads. All of the positions are 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 B31). The positions and depths of the boreholes, trial pits and pavement cores were determined by the Designer and were set out on site by Raeburn Drilling & Geotechnical Limited trading as Igne, in conjunction with the Designer.

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 rock core, pavement cores and the trial pits, together with the associated spoil heaps. A copy is presented as Figures B32 to B81.

Standard (split-barrel sampler) 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. Two sets of equipment were used for the tests and the Hammer Energy Test Reports are presented as Figures B82 and B83. The set that was used in each borehole is noted in the “Remarks” section of the borehole record.

Soakaway tests (Ref. 5) were undertaken in trial pits TP03, TP09, TP10, TP11, TP12 and TP15. The results will follow publication of this report.

Dynamic Cone Penetrometer (DCP) tests (Ref. ??) were undertaken adjacent to trial pits TP01 to TP12, TP16 to TP18 and TP20 to TP22. The results are given as Figures B84 to B102, in Appendix B, which include plots of cumulative blow count against depth and California bearing ratio (CBR) against depth.

To assess the shear strength of the soils, hand vane tests (Ref. 7) were carried out within the trial pits. The depth of the tests and the results are given on the trial pit records. However, it should be recognised that the theory behind the evaluation of vane test results assumes a smooth cylindrical failure surface. Due to the presence of gravel and indeed sand, this was not the case with most of these tests. As such, many of the results are likely to be erroneously high.

A nominal 50mm diameter perforated standpipe was installed in each of boreholes BH01, BH02 and WS01 to WS04, WS06 and WS07, 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 B_.

During the monitoring visit on 10 December 2024, the standpipes in boreholes BH01, WS01, WS02, WS03, WS04 and WS06 were purged of three well volumes. Thereafter, water samples were taken by bailer, 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

A test schedule was forwarded by the Designer. The laboratory testing was carried out by Terra Tek Limited (trading as Igne) and Socotec Limited. Both 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 C and comprised the following:

Description of Test	Figures	Ref
Moisture Content Tests	C1 to C4	8
Liquid and Plastic Limit Tests	C5 to C15	8
Particle Size Distribution Tests	C16 to C52	8
Determination of Dry Density/Water Content Relationship	C53 to C56	9
California Bearing Ratio Tests	C57 to C61	9
Unconsolidated Undrained Single Stage Triaxial Compression Tests	C62 to C69	9
Point Load tests	C70	10
BRE Tests – Socotec Test Report – 24112491		11

In addition, chemical contamination testing was carried out on thirty-six samples of made ground/soil. As noted earlier, the analyses were undertaken by Socotec Limited and test reports 24111509 and 241122027 are presented in Appendix D.

The results of the groundwater sampling described above will follow publication of the draft report.

Finally, the works involving excavations were observed by an Archaeological Clerk of Works (ACoW) and the report from the ACoW is given in Appendix E.

Principal Geochemist **Chief Engineer**

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

Ground Investigation Department

Hamilton

REFERENCES

(1) BS EN 1997-2. Eurocode 7 : Geotechnical design – Part 2 : Design assisted by laboratory testing. 2007.

(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) BRE Digest 365. Soakaway Design. Building Research Establishment. Sept., 1991.

(6) https://www.standardsforhighways.co.uk/dmrb

(7) BS1377-7:1990 Methods of test for soils for civil engineering purposes – shear strength tests (total stress)

(8) BS EN ISO 17892: Geotechnical investigation and testing. Laboratory testing of soil. Parts 1 to 12. 2014 - 2018.

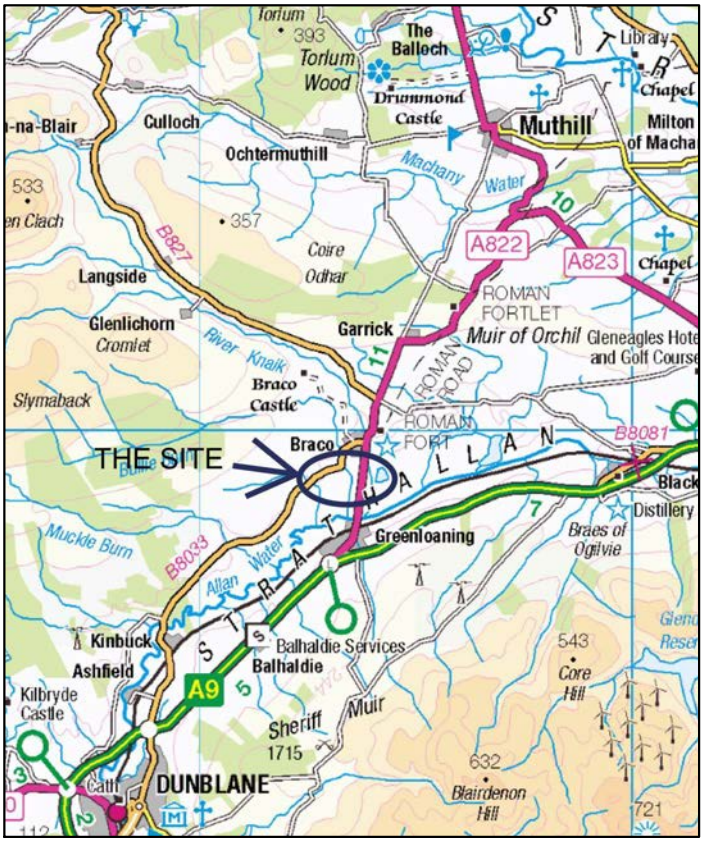
(9) BS1377: Methods of Test for Soils for Civil Engineering Purposes, British Standards Institution, 1990.

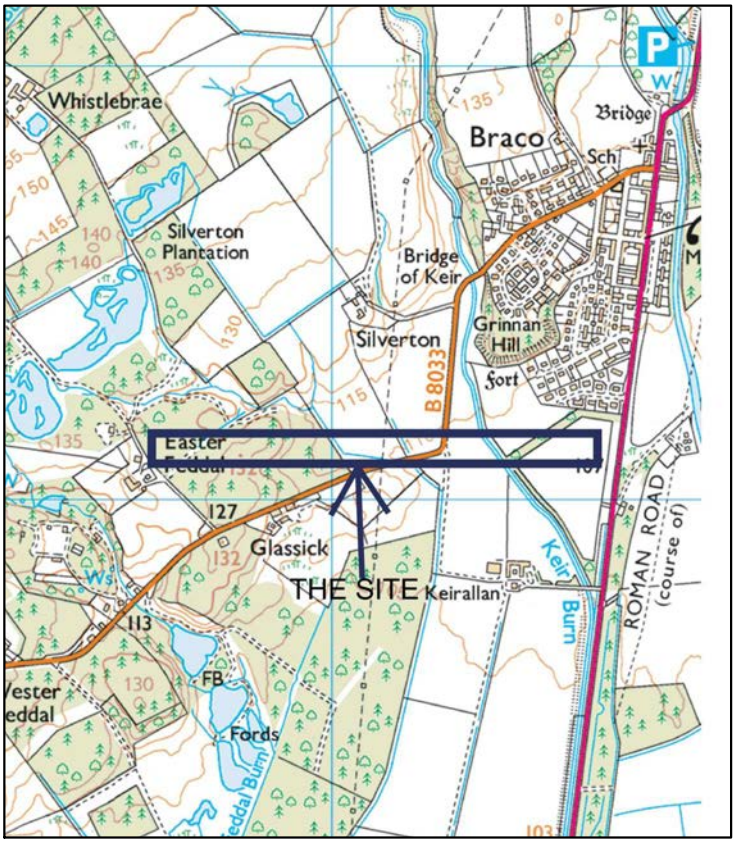
(10) Suggested Method for Determining Point Load Strength, International Society for Rock Mechanics, Commission on Testing Methods, Int. J Rock Mech. Min. Sci. and Geomech. Abstr., Vol. 22, 1985.

(11) BRE Special Digest 1. Concrete in Aggressive Ground. Building Research Establishment. 2005.

APPENDIX A
PLANS

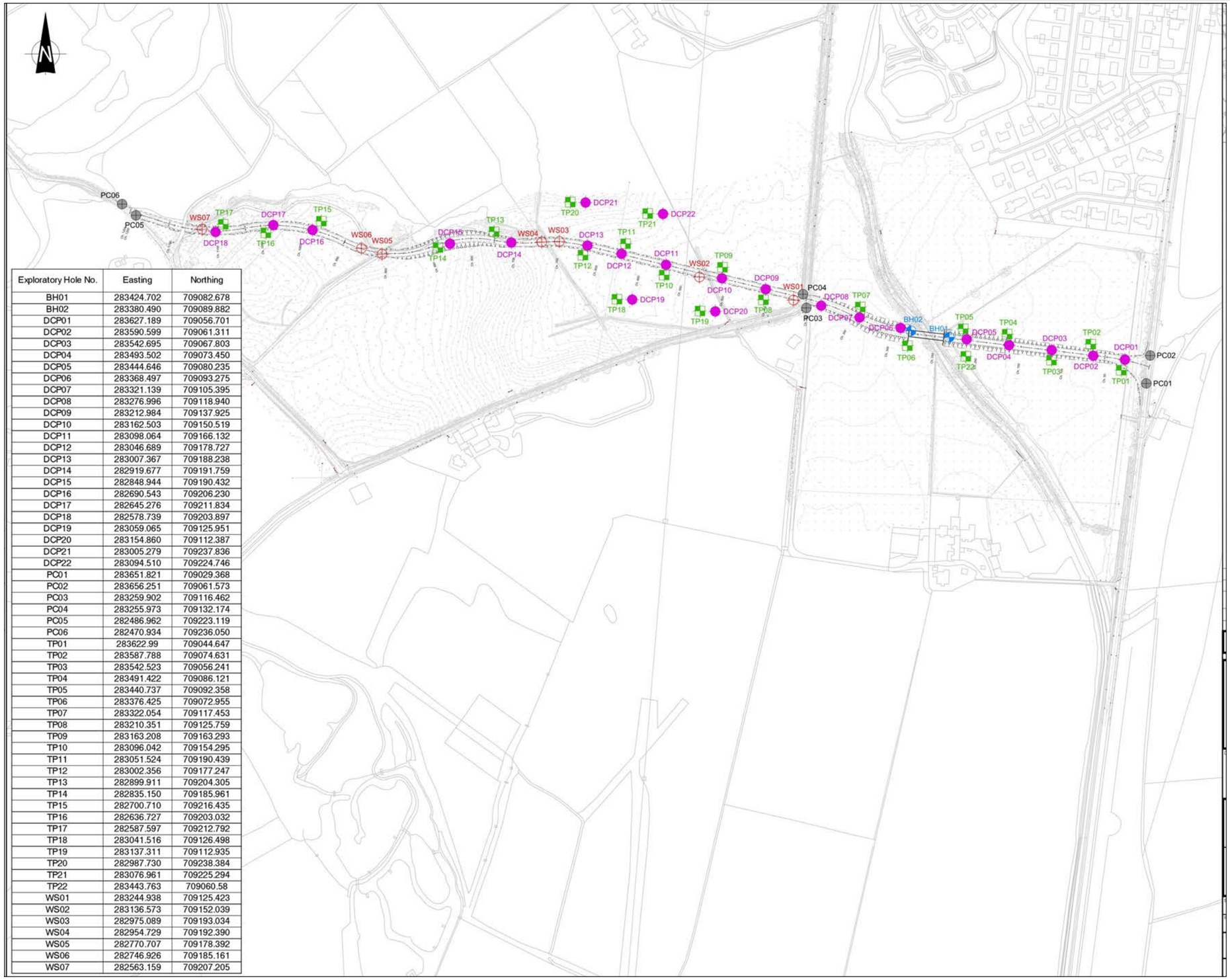
igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 Crown Copyright Licence No. 1000005786





	Originator: CB	Title: LOCATION PLAN		Fig No: A1
Chk & App: CJH	Status: Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	
	Engineer: Balfour Beatty	



Exploratory Hole No.	Easting	Northing
BH01	283424.702	709082.678
BH02	283380.490	709089.882
DCP01	283627.189	709056.701
DCP02	283590.599	709061.311
DCP03	283542.695	709067.803
DCP04	283493.502	709073.450
DCP05	283444.646	709080.235
DCP06	283368.497	709093.275
DCP07	283321.139	709105.395
DCP08	283276.996	709118.940
DCP09	283212.984	709137.925
DCP10	283162.503	709150.519
DCP11	283098.064	709166.132
DCP12	283046.689	709178.727
DCP13	283007.367	709188.238
DCP14	282919.677	709191.759
DCP15	282848.944	709190.432
DCP16	282690.543	709206.230
DCP17	282645.276	709211.834
DCP18	282578.739	709203.897
DCP19	283059.065	709125.951
DCP20	283154.860	709112.387
DCP21	283005.279	709237.836
DCP22	283094.510	709224.746
PC01	283651.821	709029.368
PC02	283656.251	709061.573
PC03	283259.902	709116.462
PC04	283255.973	709132.174
PC05	282486.962	709223.119
PC06	282470.934	709236.050
TP01	283622.99	709044.647
TP02	283587.788	709074.631
TP03	283542.523	709056.241
TP04	283491.422	709086.121
TP05	283440.737	709092.358
TP06	283376.425	709072.955
TP07	283322.054	709117.453
TP08	283210.351	709125.759
TP09	283163.208	709163.293
TP10	283096.042	709154.295
TP11	283051.524	709190.439
TP12	283002.356	709177.247
TP13	282899.911	709204.305
TP14	282835.150	709185.961
TP15	282700.710	709216.435
TP16	282636.727	709203.032
TP17	282587.597	709212.792
TP18	283041.516	709126.498
TP19	283137.311	709112.935
TP20	282987.730	709238.384
TP21	283076.961	709225.294
TP22	283443.763	709060.58
WS01	283244.938	709125.423
WS02	283136.573	709152.039
WS03	282975.089	709193.034
WS04	282954.729	709192.390
WS05	282770.707	709178.392
WS06	282746.926	709185.161
WS07	282563.159	709207.205

	Originator: CB	Title: SITE PLAN	Fig No: A2
	Chk & App: CJH	Status: Final	

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:

(a) The trial pit or borehole is rarely left standing at the relevant depth for sufficient time for the water level to reach equilibrium.
(b) A permeable stratum may have been sealed off by the borehole casing.
(c) It may have been necessary to add water to the borehole to facilitate progress.
(d) 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.

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	
	Engineer: Balfour Beatty	

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

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.

DIMENSIONS

All dimensions in metres unless otherwise stated.

KEY TO BOREHOLE AND TRIAL PIT RECORDS

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

BH01

Engineer: Balfour Beatty

Inspection Pit to 1.20m
Sonic Boring to 17.70m
Sonic Coring to 20.70m

Location:

Orientation: Vertical

Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; T2-101 Core Barrel; Water Flush

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
22/10/2024	0.00	WS										
	0.20	B, D, ES						Dark brown sandy clayey TOPSOIL with frequent rootlets. Sand is fine to coarse				
							0.50					0.50
	0.80	B, D, ES						Medium dense and dense brown clayey fine to coarse SAND and fine to coarse subangular to rounded GRAVEL of various lithologies including sandstone, quartz and basalt with cobbles. Cobbles are subrounded and rounded of sandstone, quartz and basalt. Locally passing to sandy very silty gravel				1.00
	1.20	B, D, ES	1.20	SPT=17 3.3 /3.4.5.5	0.00							
	2.20-14.70	ES										
			2.70	SPT=38 3.4 /9.10.9.10	2.70							
	3.20-14.70	ES										
			4.20	SPT=7 2.2 /2.1.2.2	4.20			....at 4.20m: Loose				
							4.60					
								Very soft and soft slightly gravelly slightly sandy CLAY of very low and low strength. Sand is fine to coarse. Gravel is fine to coarse subangular to rounded of various lithologies including sandstone, quartz and basalt				
	5.70-6.10	UT(27)			5.70							
							6.90					
22/10								Medium dense brown slightly gravelly very silty fine SAND. Gravel is fine subrounded and rounded gravel of sandstone and quartz		1.70m		
			7.20	SPT=16 1.2 /2.3.4.7	7.20					1.90m		
	8.70-8.70	UT(28)										
												10.00

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 RD53.

Hole Diam.	To Depth Boring	To Depth Casing
150	17.70	17.70
101	20.70	

Driller	Originator
CT	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
									100	Water	1.20	20.70

Fig No: B1

Sheet 1 of 3

Scale 1:50

Style: BOREHOLE NEW File: P:\GINTW\PROJECTS\26762.GPJ+44 (0)1698 710999 Printed: 13/12/2024 10:00:32 Raeburn Drilling and Geotechnical trading as IGNE, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries.raeburndrilling@igne.com

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

BH01

Engineer: Balfour Beatty

Inspection Pit to 1.20m
Sonic Boring to 17.70m
Sonic Coring to 20.70m

Location:

Orientation: Vertical

Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; T2-101 Core Barrel; Water Flush

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
			10.20	SPT=19 2.2 /4.4.5.6	10.20							
	11.70-11.70	UT(16)					12.20					
								Initially soft becoming stiff brown sandy CLAY of low to high strength with frequent thin bands of brown sand. Sand is fine				
			13.20	SPT=17 2.1 /3.4.5.5	13.20							
	14.70-14.70	UT(27)										
			16.20	SPT>50 2.2 /6.10.20.14 (240)	16.20		16.50					
								Reddish brown fine and medium grained SANDSTONE recovered as sandy fine to coarse angular and subangular gravel with cobbles. Sand is fine and medium. Cobbles are subangular of sandstone				
				TCR SCR RQD FI			17.70					
			17.70	150 150 65 >20				Moderately weak locally extremely weak pinkish grey medium to coarse grained SANDSTONE with randomly orientated calcite veins. No clear evidence of weathering.Two fracture sets. No.1: Close to medium spaced, subhorizontal, with undulose rough joints, occasional clay infill. No.2: Widely spaced, 65° with undulose rough joints				
				10								
				20								
				7								
			19.20	150 150 64 10								

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 RD53.

Hole Diam.	To Depth Boring	To Depth Casing
150	17.70	17.70
101	20.70	

Driller	Originator
CT	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
									100	Water	1.20	20.70

Fig No: B1

Sheet 2 of 3

Scale 1:50

Style: BOREHOLE NEW File: P:\GINTW\PROJECTS\26762.GPJ+44 (0)1698 710999 Printed: 13/12/2024 10:00:33 Raeburn Drilling and Geotechnical trading as IGNE, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries.raeburndrilling@igne.com

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

Engineer: Balfour Beatty

BH01

Inspection Pit to 1.20m
Sonic Boring to 17.70m
Sonic Coring to 20.70m

Location:

Orientation: Vertical

Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; T2-101 Core Barrel; Water Flush

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
			19.20	7								
23/10					17.70		20.70	END OF BOREHOLE		3.10m		20.70

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 RD53.

Hole Diam.	To Depth Boring	To Depth Casing
150	17.70	17.70
101	20.70	

Driller	Originator
CT	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
									100	Water	1.20	20.70

Fig No: B1

Sheet 3 of 3

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

BH02

Engineer: Balfour Beatty

Inspection Pit to 1.20m
Sonic Boring to 17.70m

Location:

Orientation: Vertical

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

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
24/10/2024	0.20	B, D, ES					0.10	Dark brown sandy clayey TOPSOIL with frequent rootlets. Sand is fine to coarse				
								Brown very sandy very silty fine to coarse subangular to rounded GRAVEL of various lithologies including sandstone, quartz and basalt with cobbles. Sand is fine to coarse. Cobbles are subrounded and rounded of sandstone, quartz and basalt. Locally silty				0.50
	0.80	B, D, ES										1.00
	1.20	B, D, ES	1.20	SPT=42 4.8 /8.10.10.14	0.00			....at 1.20m: Dense				
	2.20	ES										
			2.70	SPT=23 1.4 /5.6.6.6	2.70			....at 2.70m: Medium dense				
	3.20	ES										
			4.20	SPT=15 3.3 /4.3.4.4	4.20		4.90					
								Loose and medium dense locally loose brown silty fine SAND				
24/10			5.70	SPT=7 1.2 /1.1.2.3	5.70					2.30m		
										1.90m		
	7.20	D UT(13)			7.20							
			8.70	SPT=11 2.1 /1.2.3.5	8.70							10.00

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 RD53.
A 50mm diameter perforated standpipe was installed to a depth of 10.00m.

Hole Diam.	To Depth Boring	To Depth Casing
150	14.70	14.70
101	17.70	

Driller	Originator
CT	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
									100	Water	1.20	17.70

Fig No: B2

Sheet 1 of 2

Scale 1:50

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	BH02
	Engineer: Balfour Beatty	Inspection Pit to 1.20m; Sonic Boring to 17.70m
Location:	Orientation: Vertical	Equipment: Hand Tools, Track Mounted Boart Longyear LS250 Mini Sonic; Water Flush

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
	10.20	UT(16)			10.20		10.50					
								Brown fine to coarse SAND and fine to coarse subangular to rounded GRAVEL of sandstone, quartz and basalt with cobbles. Cobbles are subangular to rounded of sandstone and basalt				
			11.70	SPT>50 12.13 (100)/36.14 (115)	11.70		11.70					
								Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to rounded of sandstone, quartz and basalt				
			13.20	SPT>50 7.14 /18.22.10 (180)	13.20		13.60					
								Reddish brown fine and medium grained SANDSTONE recovered as sandy fine to coarse angular and subangular gravel with cobbles and boulders. Sand is fine to coarse. Cobbles and boulders are angular and subangular				
				TCR SCR RQD FI			14.70					
			14.70	150 150 41 >20				Moderately weak locally extremely weak pinkish grey medium grained SANDSTONE with randomly orientated calcite veins. Generally, no clear evidenceof weathering, except between 15.30m and 15.45m where the rock is weathered to residual clay and below 17.00m where the matrix is destructured. Two fracture sets. No.1: Close to medium spaced, subhorizontal, with undulose rough joints, occasional clay infill. No.2: Widely spaced, 65° with undulose rough joints				
				7								
			16.20	150 150 46 5								
				>20			17.20					
				2				Medium strong pinkish grey BASALT with quartz inclusions. No clear evidence of weathering. Two fracture sets. No.1: Medium spaced, subhorizontal, with undulose and rough joints. No.2: One fracture, 65°, with stepped and rough joints				
25/10					14.70		17.70			1.80m		17.70
								END OF BOREHOLE				

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 RD53.
A 50mm diameter perforated standpipe was installed to a depth of 10.00m.

Hole Diam.	To Depth Boring	To Depth Casing
150	14.70	14.70
101	17.70	

Driller	Originator
CT	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
									100	Water	1.20	17.70

Fig No: B2
Sheet 2 of 2
Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

WS01

Engineer: Balfour Beatty

Inspection Pit to 1.20m
WLS to 4.65m

Location:

Orientation: Vertical

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

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
15/10/2024	0.00	B, WS					0.25	Dark brown sandy TOPSOIL with frequent rootlets. Sand is fine to coarse				0.25
	0.20	B, ES						Medium dense reddish brown gravelly silty fine to coarse SAND. Gravel is fine to coarse subangular to rounded of various lithologies including sandstone, quartz and basalt. Passing to very sandy silty gravel towards base.				0.50
	0.50	D										
	0.80	B, ES										
	1.00	D										
	1.20	D, ES	1.20	SPT=14 1.3 /3.2.3.6	2.20							
	1.20-2.20	UL(262)					1.65					
	2.00	D, ES						Medium dense reddish brown slightly clayey fine to coarse SAND and fine to coarse subangular to rounded GRAVEL of various lithologies including sandstone, quartz and basalt with cobbles. Cobbles are surrounded and rounded of sandstone and basalt				
	2.20	D	2.20	SPT=37 6.9 /12.12.7.6	2.20							
	2.20-3.20	UL(201)										3.00
	3.00	D, ES										
	3.20	B, D	3.20	SPT=33 10.8 /9.8.8.8	3.20							
	3.20-4.20	UL(106)										
	4.20	D	4.20	SPT=14 4.3 /3.3.4.4	4.20							
15/10					4.20		4.65	END OF BOREHOLE		2.10m		4.65

Remarks:

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 2.50m.
The Penetration Tests were carried out using Trip Hammer TERR22.
The borehole was terminated at 4.65m on an obstruction.
A 50mm diameter perforated standpipe was installed to a depth of 3.00m.

Hole Diam.	To Depth Boring	To Depth Casing
110	4.65	2.20

Driller	Originator
JW	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off
2.50	2.05	5.00	
2.50	2.05	10.00	
2.50	2.05	15.00	
2.50	2.05	20.00	

Water Added From	To

Chiselling From	To	hh:mm

Flush Returns	Type	From (m)	To (m)

Fig No: B3

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

WS02

Engineer: Balfour Beatty

Inspection Pit to 1.20m
WLS to 5.00m

Location:

Orientation: Vertical

Equipment: Hand Tools, Yammar mouted terrier

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
15/10/2024	0.00	B, WS						Dark brown sandy TOPSOIL with frequent rootlets. Sand is fine to coarse				0.20
	0.20	ES					0.45					0.50
	0.45	B						Medium dense brown very gravelly silty fine to coarse SAND with cobbles. Gravel is fine to coarse subangular to rounded of various lithologies including sandstone, quartz and basalt. Cobbles are subangular to rounded of sandstone, quartz and basalt				
	0.50	D										
	0.80	B, ES										
	1.00	D										
	1.20	B, D, ES	1.20	SPT=32 6.7 /8.10.7.7	1.20							
	1.20-2.20	UL(301)					1.65					
	2.00	D, ES						Medium dense reddish brown fine to coarse SAND and fine to coarse subangular to rounded GRAVEL of various lithologies including sandstone, quartz and basalt with cobbles. Cobbles are subangular and subrounded of sandstone and quartz				
	2.20	D	2.20	SPT=15 5.3 /4.3.3.5	2.20							
	2.20-3.20	UL(266)										
	3.00	D										
	3.20	D	3.20	SPT=10 2.2 /3.2.2.3	3.20							
	3.20-4.20	UL(227)										
	4.20	D	4.20	SPT=14 1.1 /2.3.4.5	4.20							4.65
	4.20-5.00	UL(85)										
15/10					4.20		5.00	END OF BOREHOLE		0.90m		5.00

Remarks:

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 1.20m.
The Penetration Tests were carried out using Trip Hammer TERR22.
A 50mm diameter perforated standpipe was installed to a depth of 4.65m.

Hole Diam.	To Depth Boring	To Depth Casing
110	5.00	4.20

Driller	Originator
JW	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off
1.20	1.00	5.00	1.00
1.20	1.00	10.00	
1.20	1.00	15.00	
1.20	1.00	20.00	

Water Added From	To

Chiselling From	To	hh:mm

Flush Returns	Type	From (m)	To (m)

Fig No: B4

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

WS03

Engineer: Balfour Beatty

Inspection Pit to 1.20m
Percussion to 3.50m

Location:

Orientation: Vertical

Equipment: Hand Tools, Yammar mouted terrier

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
16/10/2024	0.00	WS					0.10	Dark brown sandy TOPSOIL with frequent rootlets. Sand is fine to coarse				0.20
	0.10	B						Soft brown sandy CLAY. Sand is fine to coarse				0.50
	0.20	ES										
	0.50	B, D					0.75					
	0.75	B						Dense and very dense reddish brown slightly gravelly silty fine to coarse SAND. Gravel is fine and medium occasionally coarse subangular to rounded of predominantly sandstone and rare quartz. Locally passing to very sandy silty gravel				
	0.80	ES										
	1.00	D										
	1.20	B, D, ES	1.20	SPT=56 2.3 /6.18.15.17	1.20							
	1.20-2.20	UL(409)										
	2.00	D, ES										
	2.20	B, D	2.20	SPT=27 4.8 /12.7.4.4	3.20							
	2.20-3.20	UL(460)										
	3.00	D, ES										
	3.20	D	3.20	SPT>50 6.14 /20.30 (150)	3.20							
16/10					3.20		3.50	END OF BOREHOLE		3.00m		3.50

Remarks:

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 1.20m.
The Penetration Tests were carried out using Trip Hammer TERR22.
The borehole was terminated 3.50m on an obstruction.
A 50mm diameter perforated standpipe was installed to a depth of 3.50m.

Hole Diam.	To Depth Boring	To Depth Casing
110	3.50	3.20

Driller	Originator
JW	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off
1.20	1.00	5.00	
1.20	1.00	10.00	
1.20	0.80	15.00	
1.20	0.75	20.00	

Water Added From	To

Chiselling From	To	hh:mm

Flush Returns	Type	From (m)	To (m)

Fig No:

B5

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

WS04

Engineer: Balfour Beatty

Inspection Pit to 1.20m
Percussion to 2.40m

Location:

Orientation: Vertical

Equipment: Hand Tools, Yammar mouted terrier

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
17/10/2024	0.00	B, WS						Dark brown sandy TOPSOIL with frequent rootlets				
	0.20	ES					0.40					0.50
	0.40 0.50	B D						Reddish brown very gravelly silty fine to coarse SAND. Gravel is fine to coarse subangular to rounded of various lithologies including sandstone, quartz and basalt				
	0.80	B, ES										
	1.00	D					1.20					
	1.20 1.20-2.20	D, ES UL(89)	1.20	SPT=8 1.2 /1.3.3.1	1.20			Loose reddish brown fine to coarse SAND and fine to coarse subangular to rounded GRAVEL of various lithologies including sandstone, quartz and basalt				
	2.00	D, ES					2.00					2.00
17/10	2.20	D	2.20	SPT>50 3.5 /10.12.28 (225)	2.20		2.40	Very dense reddish brown clayey fine to coarse SAND and fine to coarse angular and subangular GRAVEL of sandstone with cobbles. Cobbles are angular and subangular of sandstone		2.20m		2.40
								END OF BOREHOLE				

Remarks:

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 1.10m.
The Penetration Tests were carried out using Trip Hammer TERR22.
The borehole was termianted at 2.40m on an obstruction.
A 50mm diameter perforated standpipe was installed to a depth of 2.40m.

Hole Diam.	To Depth Boring	To Depth Casing
110	2.40	2.20

Driller	Originator
JW	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off
1.10	0.90	5.00	
1.10	0.90	10.00	
1.10	0.90	15.00	
1.10	0.90	20.00	

Water Added From	To

Chiselling From	To	hh:mm

Flush Returns	Type	From (m)	To (m)

Fig No: B6

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

WS05

Engineer: Balfour Beatty

Inspection Pit to 1.20m
WLS to 2.80m

Location:

Orientation: Vertical

Equipment: Hand Tools, Yammar mouted terrier

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
18/10/2024	0.00	B						Dark brown sandy TOPSOIL with frequent rootlets. Sand is fine to coarse				
	0.20	ES					0.40					
	0.40	B, D						Medium dense reddish brown gravelly fine to coarse SAND with cobbles. Gravel is fine to coarse subangular to rounded of various lithologies including sandstone, quartz and basalt. Cobbles are subangular and subrounded of sandstone				
	0.80	B, ES										
	1.00	D										
	1.20 1.20-2.20	D, ES UL	1.20	SPT=20 4.6 /6.10.0.4	1.20							
	2.00	D, ES					2.20					
	2.20 2.20-2.80	D UL	2.20	SPT=40 3.7 /12.12.8.8	2.20		2.40	Very dense reddish brown clayey fine to coarse SAND and fine to coarse angular and subangular GRAVEL of sandstone with cobbles. Cobbles are angular and subangular of sandstone				
18/10							2.80	Soft reddish brown slightly gravelly sandy CLAY of low strength with cobbles. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded of sandstone and rare quartz. Cobbles are angular and subangular of sandstone		0.40m		2.80
	2.80	D	2.80	SPT>50 25 (0)/50 (0)	2.80			END OF BOREHOLE				

Remarks:

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 1.10m.
The borehole was terminated at 2.80m on an obstruction.
The Penetration Tests were carried out using Trip Hammer TERR22.

Hole Diam.	To Depth Boring	To Depth Casing
110	2.80	2.80

Driller	Originator
JW	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off
1.00	0.80	5.00	2.20
1.00	0.70	10.00	
1.00	0.70	15.00	
1.00	0.60	20.00	

Water Added From	To

Chiselling From	To	hh:mm

Flush Returns	Type	From (m)	To (m)

Fig No: B7

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

WS06

Engineer: Balfour Beatty

Inspection Pit to 1.20m
WLS to 3.55m

Location:

Orientation: Vertical

Equipment: Hand Tools, Yammar mouted terrier

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
18/10/2024	0.00	B, WS						Dark brown sandy TOPSOIL with frequent rootlets				
	0.20	ES					0.30					
	0.30	B						Medium dense reddish brown very gravelly silty fine to coarse SAND with cobbles. Gravel is fine to coarse subangular to rounded of various lithologies including sandstone, quartz and basalt. Cobbles are subangular and subrounded of sandstone				0.50
	0.50	D										
	0.80	B, ES										
	1.00	D										
	1.20	D, ES	1.20	SPT=23 3.4 /5.7.6.5	1.20							
							1.65					1.60
								Firm reddish brown slightly gravelly sandy CLAY with cobbles. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded of sandstone and rare quartz. Cobbles are angular and subangular of sandstone				
	2.00	D, ES										
	2.20	D	2.20	SPT=42 6.11 /10.10.11.11	2.20							
	3.00	D, ES										3.00
	3.20	D	3.20	SPT>50 9.10 /10.15.50 (225)	3.20							
18/10					3.20		3.55			3.20m		3.55
								END OF BOREHOLE				

Remarks:

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 1.00m.
The Penetration Tests were carried out using Trip Hammer TERR22.
The borehole was termianted at 3.55m on an obstruction.
A 50mm diameter perforated standpipe was installed to a depth of 3.00m.

Hole Diam.	To Depth Boring	To Depth Casing
110	3.55	3.20

Driller	Originator
JW	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off
1.00	0.80	5.00	
1.00	0.75	10.00	
1.00	0.70	15.00	
1.00	0.65	20.00	

Water Added From	To

Chiselling From	To	hh:mm

Flush Returns	Type	From (m)	To (m)

Fig No: B8

Sheet 1 of 1

Scale 1:50

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	WS07
	Engineer: Balfour Beatty	Inspection Pit to 1.20m WLS to 3.40m
Location:	Orientation: Vertical	Equipment: Hand Tools, Yammar mouted terrier

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
18/10/2024	0.00	B						Dark brown sandy TOPSOIL with frequent rootlets. Sand is fine to coarse				0.20
	0.20	ES					0.40					
	0.40	B						Medium dense reddish brown very gravelly silty fine to coarse SAND with cobbles. Gravel is fine to coarse subangular to rounded of various lithologies including sandstone, quartz and basalt. Cobbles are subangular and subrounded of sandstone				0.50
	0.50	D										
	0.80	B, ES										
	1.00	D										
	1.20	D, ES UL	1.20	SPT=20 2.6 /4.4.6.6								
	2.00	D, ES										
18/10	2.20	D	2.20	SPT=15 1.1 /2.3.5.5	2.20					0.90m		
	2.20-3.20	UL(206)								1.15m		
	3.00	D, ES										
	3.20	D			3.20							
21/10	3.20-3.40	UL(80)	3.40	SPT>50 25 (0)/50 (10)	3.20		3.40	END OF BOREHOLE		3.00m		3.40

Remarks:

Description based on Driller's log.
An inspection pit was excavated by hand to a depth of 1.20m to clear services.
Ground-water was encountered at a depth of 1.00m.
The Penetration Tests were carried out using Trip Hammer TERR22.
The borehole was terminated at 3.40m due to an obstruction.
A 50mm diameter perforated standpipe was installed to a depth of 3.40m.

Hole Diam.	To Depth Boring	To Depth Casing
110	3.40	3.20

Driller	Originator
JW	JDUD
Chk & App	Status
FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off
1.00	0.90	5.00	0.90
1.00	0.90	10.00	
1.00	0.90	15.00	
1.00	0.90	20.00	

Water Added From	To

Chiselling From	To	hh:mm

Flush Returns	Type	From (m)	To (m)

Fig No: B9
Sheet 1 of 1
Scale 1:50

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. TP01
	Engineer: Balfour Beatty	Trial Pit to 2.40m
Location:	Orientation: Vertical	Equipment: 8T Tracked Excavator
		Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
23/10/2024	0.20	D, ES, LB					0.40	Dark brown gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is fine to coarse subangular to rounded of sandstone and mudstone. Cobbles are subangular to rounded of mudstone				
	1.20	D, ES						Light bluish brown very sandy very silty fine to coarse subangular to rounded GRAVEL of mudstone and sandstone with high cobble content. Sand is fine to coarse. Cobbles are subangular to rounded of sandstone and mudstone				
								…. From 2.00 metres to 2.40 metres cobbles decrease				
23/10	2.20	D, ES, LB					2.40	END OF BOREHOLE		2.30m		2.40

Remarks:
Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 2.20m as rapid ingress.
The walls of the pit stood vertical throughout excavation.
Trial pit terminated at a depth of 2.40m due to ground-water ingress.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
2.20												

Fig No: B10
Sheet 1 of 1
Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP02

Trial Pit to 1.90m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
23/10/2024							0.40	Dark brown gravelly slightly clayey fine to coarse SAND with medium cobble content. Gravel is fine to coarse subangular to rounded of sandstone and mudstone. Cobbles are subangular to rounded of mudstone				
	0.50	D, ES						Light bluish brown sandy silty fine to coarse subangular to rounded GRAVEL of mudstone and sandstone with high cobble content. Sand is fine to coarse. Cobbles are subangular to rounded of sandstone and mudstone				
	1.00	LB										
	1.50	D, ES										
23/10							1.90	END OF BOREHOLE		1.85m		1.90

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 1.80m as rapid ingress.
The walls of the pit stood vertical throughout excavation.
Trial pit terminated at a depth of 1.90m due to ground-water ingress.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)

Fig No: B11

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP03

Trial Pit to 2.30m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
23/10/2024								Light brown slightly gravelly slightly silty fine to coarse SAND. Gravel is fine to coarse subangular to rounded of sandstone				
	0.50	D, ES, LB					0.65					
								Bluish brown sandy slightly silty fine to coarse angular and subangular GRAVEL of sandstone and mudstone with high cobble content. Sand is fine to coarse. Cobbles are subangular to rounded of sandstone and mudstone				
	1.50	D, ES										
	2.00	LB										
23/10							2.30			Dry		2.30
								END OF BOREHOLE				

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was not encountered.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 2.30m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)

Fig No: B12

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

Trial Pit No. TP04

Engineer: Balfour Beatty

Trial Pit to 3.00m

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.50m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
22/10/2024								Dark brown gravelly slightly clayey fine to coarse SAND with medium cobble content. Gravel is fine to coarse subangular to rounded of sandstone and mudstone. Cobbles are subangular to rounded of mudstone				
	0.50	D, ES, LB					0.85					
							1.00	Light brown slightly gravelly silty fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone and mudstone				
	1.50	D, ES						Light brown very sandy silty fine to coarse subangular to rounded GRAVEL of mudstone and sandstone with high cobble content. Sand is fine to coarse. Cobbles are subangular to rounded of sandstone and mudstone				
	2.50	D, ES, LB										
22/10							3.00	END OF BOREHOLE		Dry		3.00

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was not encountered.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 3.00m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)

Fig No: B13

Sheet 1 of 1

Scale 1:50

Style: BOREHOLE NEW File: P:\GINTW\PROJECTS\26762.GPJ+44 (0)1698 710999 Printed: 13/12/2024 10:02:21 Raeburn Drilling and Geotechnical trading as IGNE, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries.raeburndrilling@igne.com

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP05

Trial Pit to 3.10m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
22/10/2024								Dark brown gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is fine to coarse subangular to rounded of sandstone and mudstone. Cobbles are subangular to rounded of mudstone				
	0.60	D, ES, LB					0.65					
								Light brown slightly gravelly silty fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone and mudstone				
							0.95					
	1.60	D, ES						Light brown sandy slightly silty fine to coarse subangular to rounded GRAVEL of mudstone and sandstone with high cobble content. Sand is fine to coarse. Cobbles are subangular to rounded of sandstone and mudstone				
	2.60	D, ES, LB										
22/10							3.10	END OF BOREHOLE		Dry		3.10

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was not encountered.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 3.10m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
	RJB													
Chk & App	Status													
FMR	**Final**													

Fig No: B14

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP06

Trial Pit to 2.90m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.70m Length - 2.80m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
15/10/2024								Light brown very sandy slightly silty fine to coarse subangular to rounded GRAVEL of quartz and sandstone. Sand is fine to coarse				
	0.50	B, D										
	1.00	ES					1.20					
								Dark greyish brown very gravelly very silty fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular to subrounded of sandstone. Cobbles are angular to subrounded of sandstone				
	1.50	B, D					1.80					
								Dark greyish brown sandy slightly silty fine to coarse GRAVEL of sandstone and mudstone. Sand is fine to coarse				
	2.50	B, D										
15/10							2.90			2.90m		2.90
								END OF BOREHOLE				

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 2.80m as rapid ingress.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 2.90m due to sidewall collapse and ground-water ingress.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)

Fig No: B15

Sheet 1 of 1

Scale 1:50

Style: BOREHOLE NEW File: P:\GINT\WPROJECTS\26762.GPJ+44 (0)1698 710999 Printed: 13/12/2024 10:02:26 Raeburn Drilling and Geotechnical trading as IGNE, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries.raeburndrilling@igne.com

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP07

Trial Pit to 2.50m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.60m Length - 2.80m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
17/10/2024								Light brown gravelly slightly silty fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular to subrounded of sandstone and mudstone. Cobbles are angular to subrounded of sandstone				
	0.50	B, D, ES					0.60					
								Light brown very sandy silty fine to coarse angular to subrounded GRAVEL of mudstone and sandstone with low cobble content. Sand is fine to coarse. Cobbles are angular and subangular of sandstone				
	1.50	D, ES										
17/10							2.50			2.30m		2.50
	2.50	B, D, ES						END OF BOREHOLE				

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 2.30m as rapid ingress.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 2.50m due to sidewall collapse and ground-water ingress.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RB	FMR	**Final**

Ground-water Struck	Ground-water Rose To	Ground-water Time(min)	Ground-water Cut Off	Water Added From	Water Added To	Chiselling From	Chiselling To	Chiselling hh:mm	Flush Returns	Flush Type	Flush From (m)	Flush To (m)
2.30												

Fig No: B16

Sheet 1 of 1

Scale 1:50

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. TP08
	Engineer: Balfour Beatty	Trial Pit to 2.20m
Location:	Orientation: Vertical	Equipment: 8T Tracked Excavator
		Width - 1.60m Length - 1.80m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
17/10/2024	0.20	D, ES						Light brown gravelly slightly silty fine to coarse SAND with cobbles. Gravel is fine to coarse angular and subangular of sandstone and mudstone. Cobbles are angular to subrounded of sandstone				
	0.50	LB					0.70					
	1.20	D, ES						Light brown very sandy silty fine to coarse angular to subrounded GRAVEL of mudstone and sandstone with medium cobble content. Sand is fine to coarse. Cobbles are angular and subangular of sandstone and mudstone				
17/10	2.20	B, D, ES, LB					2.20	END OF BOREHOLE		1.90m		2.20

Remarks:
Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 1.90m as rapid ingress.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 2.20m due to sidewall collapse and ground-water ingress.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Ground-water Rose To	Ground-water Time(min)	Ground-water Cut Off	Water Added From	Water Added To	Chiselling From	Chiselling To	Chiselling hh:mm	Flush Returns	Flush Type	Flush From (m)	Flush To (m)
1.90												

Fig No: B17
Sheet 1 of 1
Scale 1:50

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. TP09
	Engineer: Balfour Beatty	Trial Pit to 2.20m
Location:	Orientation: Vertical	Equipment: 8T Tracked Excavator
		Width - 1.60m Length - 1.80m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
18/10/2024	0.20	D, ES, LB						Light brown gravelly slightly clayey fine to coarse SAND. Gravel is fine to coarse angular to subrounded				
							0.60					
	1.20	D, ES, LB						Light brown very sandy silty fine to coarse angular to subrounded GRAVEL of sandstone and mudstone with medium cobble content. Sand is fine to coarse. Cobbles are angular to subrounded of sandstone				
18/10	2.20	D, ES, LB					2.20	END OF BOREHOLE		1.90m		2.20

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 1.90m as rapid ingress.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 2.20m due to sidewall collapse and ground-water ingress.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
1.90												

Fig No: B18
Sheet 1 of 1
Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP10

Trial Pit to 2.00m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.60m Length - 1.80m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
18/10/2024								Dark greyish brown slightly gravelly silty fine to coarse SAND with low cobble content. Gravel is fine to coarse angular to subrounded of sandstone and mudstone. Cobbles are angular to subrounded of mudstone				
	0.50	D, ES					0.60					
	1.00	LB						Reddish brown gravelly slightly silty fine to coarse SAND with low cobble content. Gravel is fine to coarse angular to subrounded of sandstone. Cobbles are angular to subrounded of sandstone and mudstone. Locally passing to very sandy silty gravel				
	1.50	D, ES										
18/10							2.00	END OF BOREHOLE		1.90m		2.00

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 1.70m as moderate inflow.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 2.00m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Ground-water Rose To	Ground-water Time(min)	Ground-water Cut Off	Water Added From	Water Added To	Chiselling From	Chiselling To	Chiselling hh:mm	Flush Returns	Flush Type	Flush From (m)	Flush To (m)
1.70												

Fig No: B19

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP11

Trial Pit to 1.90m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.60m Length - 1.80m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
18/10/2024								Dark greyish brown slightly gravelly silty fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular to subrounded of sandstone and mudstone. Cobbles are angular to subrounded of sandstone				
	0.50	D, ES					0.60					
	1.00	LB						Reddish brown very gravelly silty fine to coarse SAND with high cobble content. Gravel is fine to coarse angular to subrounded of sandstone. Cobbles are angular to subrounded of sandstone and mudstone				
	1.50	D, ES										
18/10							1.90			▼ 1.90m		1.90
								END OF BOREHOLE				

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 1.85m as rapid ingress.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 1.90m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
	RJB	1.85												
Chk & App	Status													
FMR	**Final**													

Fig No: B20

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP12

Trial Pit to 2.20m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.60m Length - 1.80m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
17/10/2024	0.20	D, ES, LB						Dark greyish brown slightly gravelly clayey fine to coarse SAND with low cobble content. Gravel is fine to coarse angular to subrounded of sandstone				
							0.60					
	1.20	D, ES						Reddish brown gravelly silty fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular to subrounded of sandstone. Cobbles are angular to subrounded of sandstone				
18/10	2.20	D, ES, LB					2.20	END OF BOREHOLE		Dry		2.20

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was not encountered.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 2.20m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Ground-water Rose To	Ground-water Time(min)	Ground-water Cut Off	Water Added From	Water Added To	Chiselling From	Chiselling To	Chiselling hh:mm	Flush Returns	Flush Type	Flush From (m)	Flush To (m)

Fig No: B21

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP13

Trial Pit to 3.20m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
23/10/2024								Dark brown slightly gravelly slightly silty fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone and mudstone				
	0.50	D, ES, LB					0.70					
								Light brown very gravelly silty fine to coarse SAND with low cobble and boulder content. Gravel is fine to coarse angular to subrounded of sandstone and mudstone. Cobbles are subangular to round of sandstone and mudstone. Boulders are subangular to rounded of sandstone and mudstone up to 700mm				
	1.50	D, ES, LB										
							2.40					
	2.50	D, ES, LB						Light brown very sandy very silty fine to coarse angular to subrounded GRAVEL of mudstone and sandstone with low cobble and boulder content. Sand is fine to coarse. Cobbles are angular to subrounded of sandstone. Boulders are angular and subangular of sandstone up to 500mm				
23/10							3.20			Dry		3.20
								END OF BOREHOLE				

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was not encountered.
The walls of the pit stood vertical throughout excavation.
Trial pit terminated at a depth of 3.20m due to obstruction - possible bedrock.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
	RJB													
Chk & App	Status													
FMR	**Final**													

Fig No: B22

Sheet 1 of 1

Scale 1:50

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. TP14
	Engineer: Balfour Beatty	Trial Pit to 3.40m
Location:	Orientation: Vertical	Equipment: 8T Tracked Excavator
		Width - 2.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
25/10/2024								Light brown gravelly slightly silty fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone and mudstone				
							0.40					
	0.50	D, ES, LB						Light brown very sandy silty fine to coarse angular to subrounded GRAVEL of sandstone with low cobble and boulder content. Sand is fine to coarse. Cobbles are angular to subrounded of sandstone. Boulders are angular and subangular of sandstone up to 500mm. Locally passing to silty sand and gravel				
	1.50	D, ES										
	2.50	D, ES, LB										
25/10							3.40			Dry		3.40
								END OF BOREHOLE				

Remarks:
Trial pit CAT scanned prior to excavation to check for services.
Ground-water was not encountered.
The walls of the pit stood vertical throughout excavation.
Trial pit terminated at a depth of 3.20m due to undermining of excavator due to restrictions on pit size due to landowner's restrictions.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
	RJB													
Chk & App	Status													
FMR	**Final**													

Fig No: B23
Sheet 1 of 1
Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP15

Trial Pit to 1.90m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
25/10/2024								Dark brown slightly gravelly silty fine to coarse SAND with decomposed rootlets. Gravel is fine to coarse subangular to rounded of sandstone and mudstone				
	0.50	D, ES					0.50					
	1.00	LB						Light brown slightly gravelly clayey fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone. Locally passing to very sandy silty gravel				
	1.50	D, ES										
25/10							1.90	END OF BOREHOLE		1.85m		1.90

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 1.80m as rapid ingress.
The walls of the pit stood vertical throughout excavation.
Trial pit terminated at a depth of 1.90m due to ground-water ingress.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
1.80												

Fig No: B24

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP16

Trial Pit to 2.00m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.80m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
25/10/2024								Dark brown gravelly silty fine to coarse SAND with decomposed rootlets. Gravel is fine to coarse subangular to rounded of sandstone and mudstone				
	0.50	D, ES										
	1.00	LB										
	1.50	D, ES					1.50					
								Brown slightly gravelly slightly sandy SILT. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded of sandstone				
25/10							2.00			1.95m		2.00
								END OF BOREHOLE				

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 1.90m as rapid ingress.
The walls of the pit collapsed throughout excavation.
Trial pit terminated at a depth of 2.00m due to ground-water ingress and sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Ground-water Struck	Ground-water Rose To	Ground-water Time(min)	Ground-water Cut Off	Water Added From	Water Added To	Chiselling From	Chiselling To	Chiselling hh:mm	Flush Returns	Flush Type	Flush From (m)	Flush To (m)
	RJB	1.90												
Chk & App	Status													
FMR	**Final**													

Fig No: B25

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP17

Trial Pit to 1.35m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
24/10/2024	0.20	D					0.40	Dark brown slightly gravelly silty fine to coarse SAND with decomposed rootlets. Gravel is fine to coarse subangular to rounded of sandstone and mudstone				
	0.50	D, ES, LB						Dark brown sandy slightly silty fine to coarse angular and subangular GRAVEL of sandstone. Sand is fine to coarse				
	1.00	D										
24/10							1.35	END OF BOREHOLE		1.20m		1.35

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 1.00m as moderate inflow.
The walls of the pit stood vertical throughout excavation.
Trial pit terminated at a depth of 1.35m due to ground-water ingress.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
1.00												

Fig No: B26

Sheet 1 of 1

Scale 1:50

Style: BOREHOLE NEW File: P:\GINTW\PROJECTS\26762.GPJ+44 (0)1698 710999 Printed: 13/12/2024 10:02:54 Raeburn Drilling and Geotechnical trading as IGNE, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries.raeburndrilling@igne.com

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

Trial Pit No. TP18

Engineer: Balfour Beatty

Trial Pit to 2.60m

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
21/10/2024							0.35	Dark brown slightly gravelly clayey fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone				
	0.50	D, ES, LB					0.50	Light brown gravelly slightly clayey fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone				
								Light grey slightly sandy slightly silty fine to coarse angular to subrounded GRAVEL of sandstone. Sand is fine to coarse. Locally passing to silty sand and gravel				
	1.50	D, ES										
21/10	2.50	D, ES, LB					2.60	END OF BOREHOLE		2.55m		2.60

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Groundwater was encounetered as seepage below 1.90m.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 2.60m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)

Fig No: B27

Sheet 1 of 1

Scale 1:50

igne
Style: BOREHOLE NEW File: P:\GINTW\PROJECTS\26762.GPJ+44 (0)1698 710999 Printed: 13/12/2024 10:02:57 Raeburn Drilling and Geotechnical trading as IGNE, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries.raeburndrilling@igne.com

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP19

Trial Pit to 1.90m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
21/10/2024							0.30	Dark brown slightly gravelly clayey fine to coarse SAND. Gravel is fine to coarse subangular and subrounded of sandstone				
	0.50	D, ES					0.90	Light brown gravelly slightly clayey fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone				
	1.00	LB						Light grey very sandy slightly silty fine to coarse angular to subrounded GRAVEL of sandstone with low cobble content. Sand is fine to coarse. Cobbles are angular and subangular of sandstone. Locally passing to silty sand and gravel				
	1.50	D, ES										
21/10							1.90	END OF BOREHOLE		1.85m		1.90

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 1.70m as rapid inflow.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 1.90m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
1.70												

Fig No: B28

Sheet 1 of 1

Scale 1:50

Style: BOREHOLE NEW File: P:\GINTW\PROJECTS\26762.GPJ+44 (0)1698 710999 Printed: 13/12/2024 10:02:59 Raeburn Drilling and Geotechnical trading as IGNE, Whistleberry Rd, Hamilton ML3 0HP Tel: 01698-711177 E-mail: enquiries.raeburndrilling@igne.com

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP20

Trial Pit to 3.00m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.60m Length - 1.80m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
17/10/2024	0.20	D, ES						Light brown gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is fine to coarse angular to subrounded. Cobbles are angular to subrounded of sandstone				
	0.50	LB					0.60					
			0.80	HV at 0.80m I=40 R=10kPa HV at 0.80m I=28 R=10kPa HV at 0.80m I=22 R=10kPa				Firm dark brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular and subrounded of sandstone				
	1.20	D, ES					1.20					
								Light brown very gravelly clayey fine to coarse SAND with low cobble content. Gravel is fine to coarse angular to subrounded. Cobbles are angular to subrounded of sandstone				
	2.20	D, ES										
	2.50	LB										
17/10							3.00			2.70m		3.00
								END OF BOREHOLE				

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was encountered at a depth of 2.50m as moderate inflow.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 3.00m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)
2.50												

Fig No: B29

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP21

Trial Pit to 3.10m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
21/10/2024							0.35	Dark brown slightly gravelly clayey fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone				
	1.00	D, ES, LB					1.50	Light brown gravelly clayey fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone				
	2.00	D, ES						Light brown gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is fine to coarse angular to subrounded of sandstone. Cobbles are angular and subangular of sandstone				
21/10	3.00	D, ES, LB					3.10	END OF BOREHOLE		Dry		3.10

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was not encountered.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 3.10m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)

Fig No: B30

Sheet 1 of 1

Scale 1:50

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Trial Pit No. TP22

Trial Pit to 3.00m

Client: Balfour Beatty

Engineer: Balfour Beatty

Location:

Orientation: Vertical

Equipment: 8T Tracked Excavator

Width - 1.80m Length - 2.50m

Progress	Samples Depth	Samples Type	Tests Depth	Tests Result	Casing Depth	Level (mAOD)	Depth	Description of Strata	Legend	Water Depth	Backfill Symbol	Backfill Depth
22/10/2024								Dark brown gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is fine to coarse subangular to rounded of sandstone and mudstone. Cobbles are subangular to rounded of mudstone				
	0.60	D, ES, LB					0.70					
								Light brown sandy slightly silty fine to coarse subangular to rounded GRAVEL of mudstone and sandstone with high cobble content. Sand is fine to coarse. Cobbles are subangular to rounded of sandstone and mudstone				
	1.60	D, ES										
	2.60	D, ES, LB										
22/10							3.00	END OF BOREHOLE		Dry		3.00

Remarks:

Trial pit CAT scanned prior to excavation to check for services.
Ground-water was not encountered.
The walls of the pit collapsed throughout excavation - sidewalls collased.
Trial pit terminated at a depth of 3.00m due to sidewall collapse.

Hole Diam.	To Depth Boring	To Depth Casing

Driller	Originator	Chk & App	Status
	RJB	FMR	**Final**

Ground-water Struck	Rose To	Time(min)	Cut Off	Water Added From	To	Chiselling From	To	hh:mm	Flush Returns	Type	From (m)	To (m)

Fig No: B31

Sheet 1 of 1

Scale 1:50

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Borehole No.** **BH01**

	Originator: RB	Title: PHOTOGRAPHS OF ROCK CORE		Fig No: B32
	Chk & App: CJH	Status: Final		

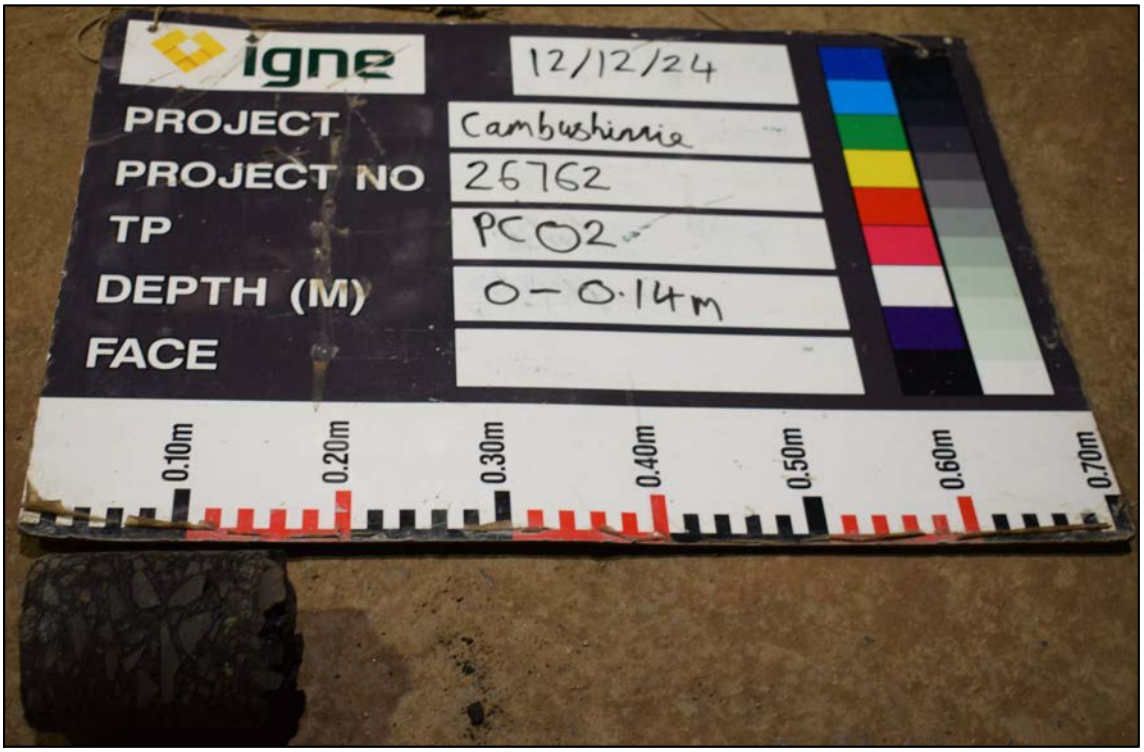
igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Borehole No.** **BH02**

	Originator: RB	Title: PHOTOGRAPHS OF ROCK CORE		Fig No: B33
	Chk & App: CJH Status: Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Borehole No.** **PC01**

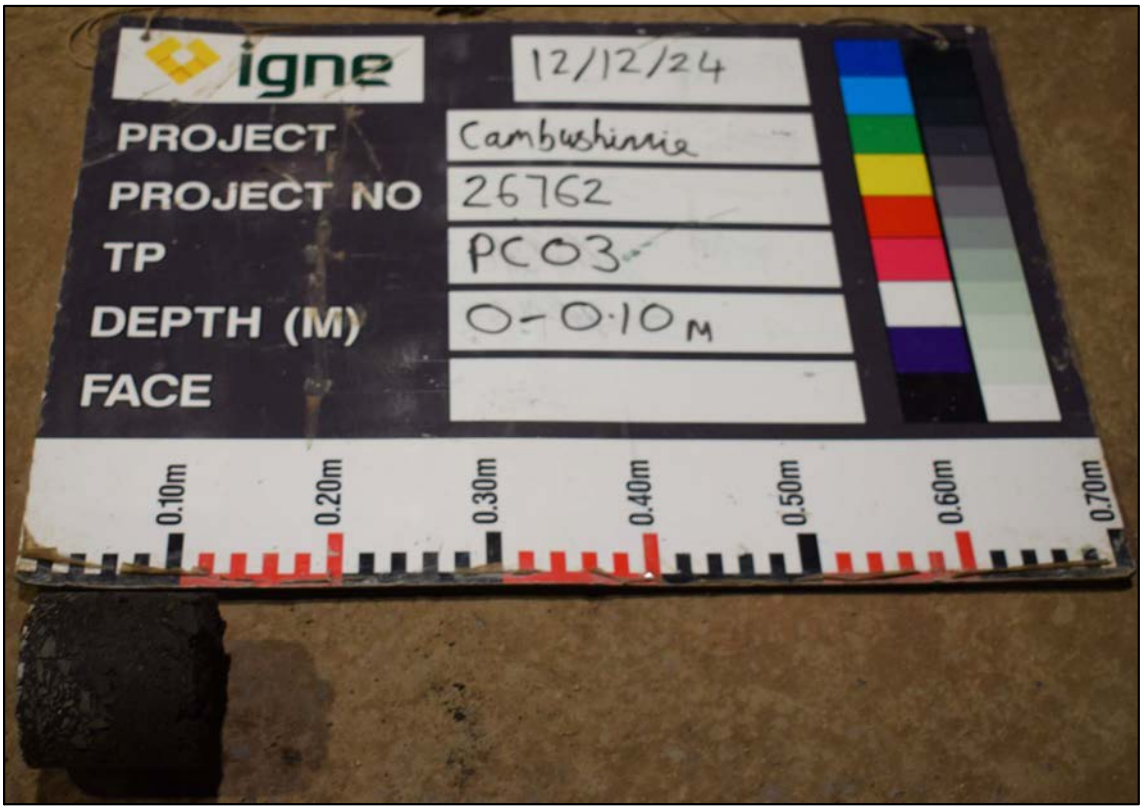
	Originator CB	Title: PHOTOGRAPHS OF PAVEMENT CORES		Fig No: B34
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Borehole No.** **PC02**



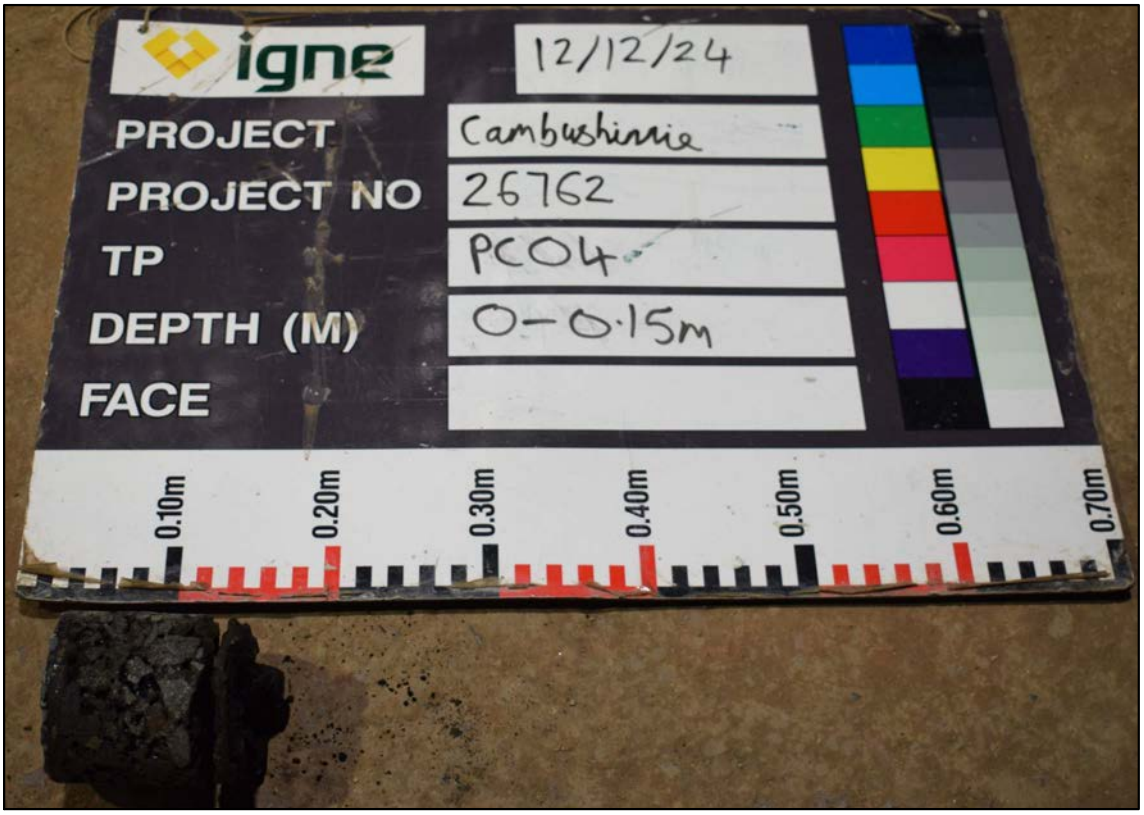
	Originator: CB	Title: PHOTOGRAPHS OF PAVEMENT CORES	Fig No: B35
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Borehole No.** **PC03**



	Originator: CB	Title: PHOTOGRAPHS OF PAVEMENT CORES	Fig No: B36
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Borehole No.** **PC04**



	Originator: CB	Title: PHOTOGRAPHS OF PAVEMENT CORES		Fig No: B37
Chk & App: CJH	Status: Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. **TP01**
	Engineer: Balfour Beatty	

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B38
	Chk & App CJH	Status Final		

	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty Engineer: Balfour Beatty	**Trial Pit No.** **TP01**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B39
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP02**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B40
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP02**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B41
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. **TP03**
	Engineer: Balfour Beatty	

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B42
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 Trial Pit No. **TP03**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B43
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP04**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B44
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP04**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B45
	Chk & App: CJH Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP05**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B46
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP05**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B47
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 Trial Pit No. **TP06**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B48
Chk & App: CJH	Status: Final		

	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty Engineer: Balfour Beatty	**Trial Pit No.** **TP06**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B49
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP07**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B50
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP07**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B51
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. **TP08**
	Engineer: Balfour Beatty	

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B52
Chk & App CJH	Status Final			

	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty Engineer: Balfour Beatty	**Trial Pit No.** **TP08**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B53
Chk & App CJH	Status Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP09**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B54
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP09**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B55
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP10**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B56
	Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP10**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B57
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. TP11
	Engineer: Balfour Beatty	

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B58
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP11**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B59
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP12**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B60
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP12**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B61
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP13**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B62
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP13**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B63
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP14**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B64
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP14**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B65
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. **TP15**
	Engineer: Balfour Beatty	

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B66
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP15**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B67
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP16**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B68
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP16**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B69
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP17**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B70
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP17**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B71
	Chk & App: CJH Status: Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP18**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B72
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP18**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B73
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP19**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B74
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP19**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B75
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP20**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B76
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP20**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B77
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP21**

	Originator RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B78
Chk & App CJH	Status Final			

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. **TP21**
	Engineer: Balfour Beatty	

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B79
Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION	Contract No: 26762
	Client: Balfour Beatty	Trial Pit No. **TP22**
	Engineer: Balfour Beatty	

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS		Fig No: B80
	Chk & App: CJH	Status: Final		

igne	Site: CAMBUSHINNIE 400KV SUBSTATION Client: Balfour Beatty Engineer: Balfour Beatty	Contract No: 26762 **Trial Pit No.** **TP22**

	Originator: RB	Title: PHOTOGRAPHS OF TRIAL PITS	Fig No: B81
	Chk & App: CJH Status: Final		

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Whistleberry Road
Hamilton
ML3 0HP

SPT Hammer Ref: RD53 2024
Test Date: 05/02/2024
Report Date: 05/02/2024
File Name: RD53 2024.spt
Test Operator: KS

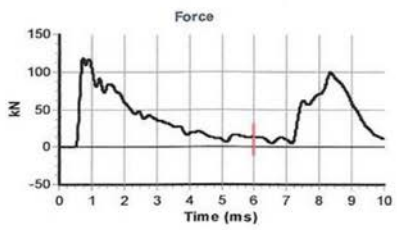
Instrumented Rod Data

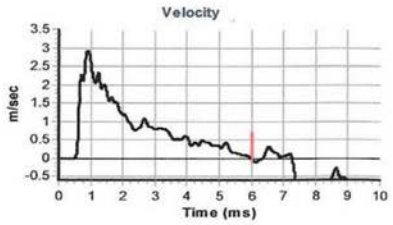
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.6
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	69559
Accelerometer No.2:	69560

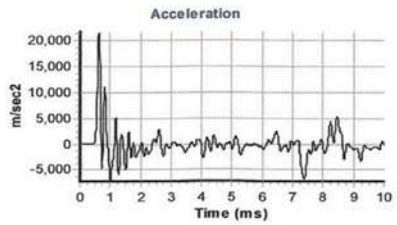
SPT Hammer Information

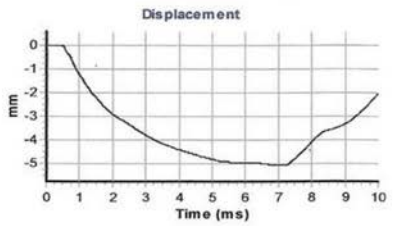
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	14.5

Comments / Location









Calculations

Area of Rod A (mm2):	983
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	339

Energy Ratio E_r (%): 72

Signed: Kevin Steele
Title: Drilling Store Manager

The recommended calibration interval is 12 months

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Whistleberry Road
Hamilton
ML3 0HP

SPT Hammer Ref: TER22 2024
Test Date: 12/06/2024
Report Date: 12/06/2024
File Name: TER22 2024.spt
Test Operator: KS

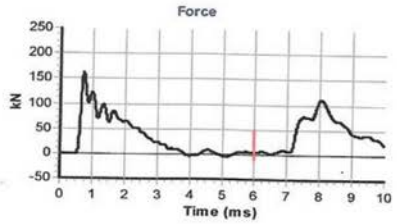
Instrumented Rod Data

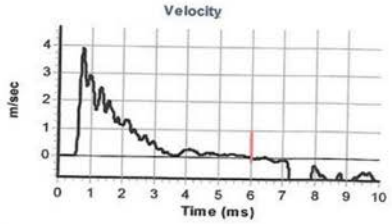
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.8
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	69559
Accelerometer No.2:	69560

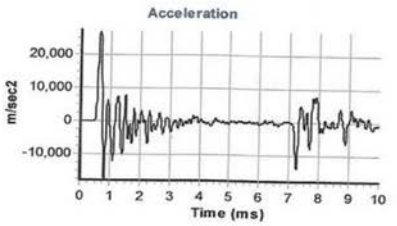
SPT Hammer Information

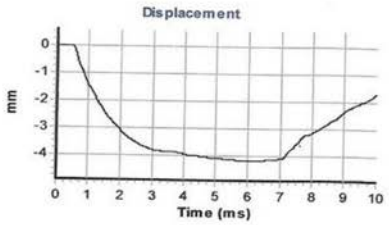
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	14.5

Comments / Location









Calculations

Area of Rod A (mm2):	1008
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	348

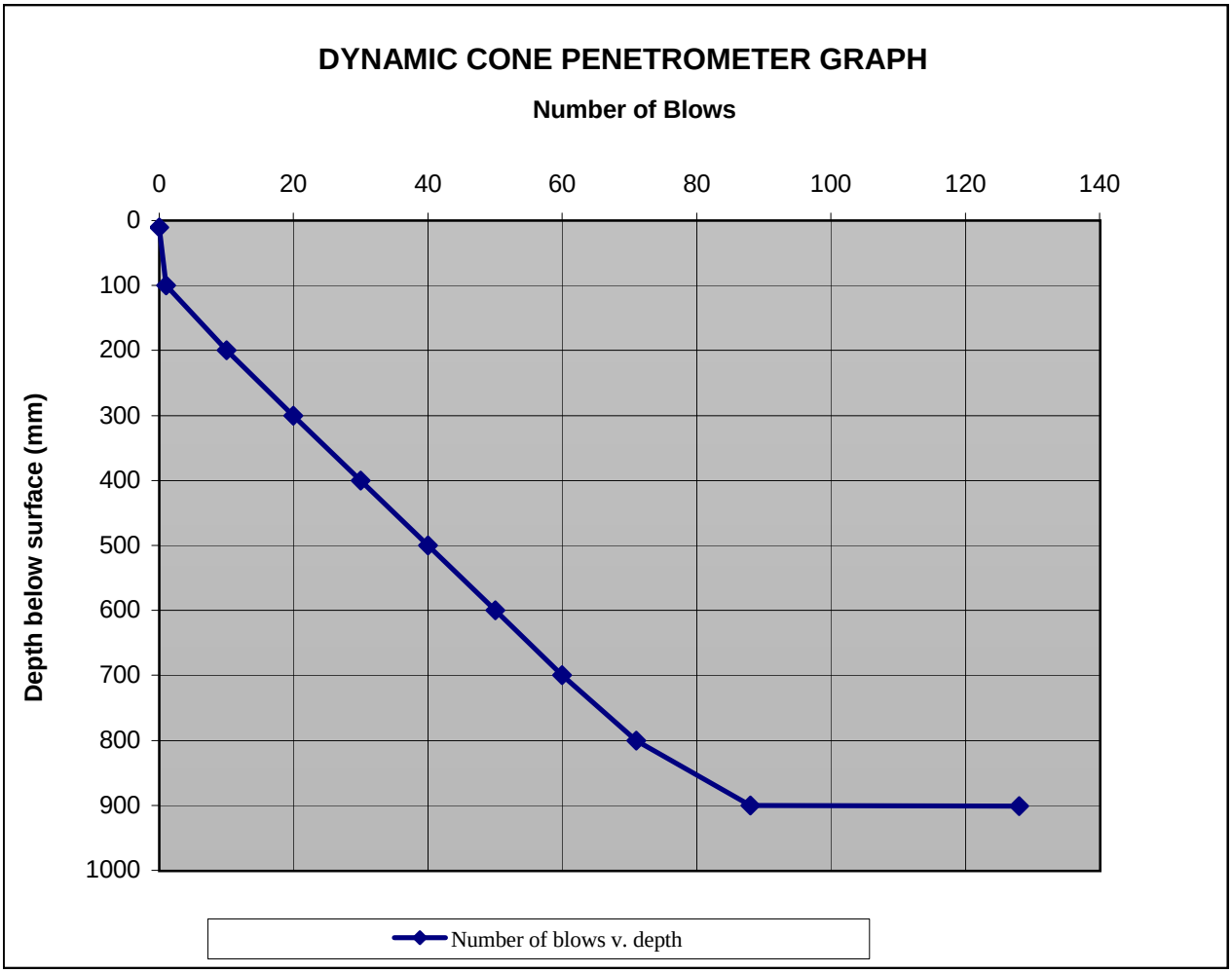
Energy Ratio E_r (%): 73

The recommended calibration interval is 12 months

Signed: Kevin Steele
Title: Drilling Store Manager

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	23/10/2024	Test Location	~
Tested by	JW	DCP No.	1
Weather	Variable	Zero Error (mm)	11



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
11	100	1	1	Unknown	89.00	3
100	900	88	87	Unknown	9.20	29
900	901	128	40	Unknown	0.03	14907

Remarks:

Cone Angle 60°

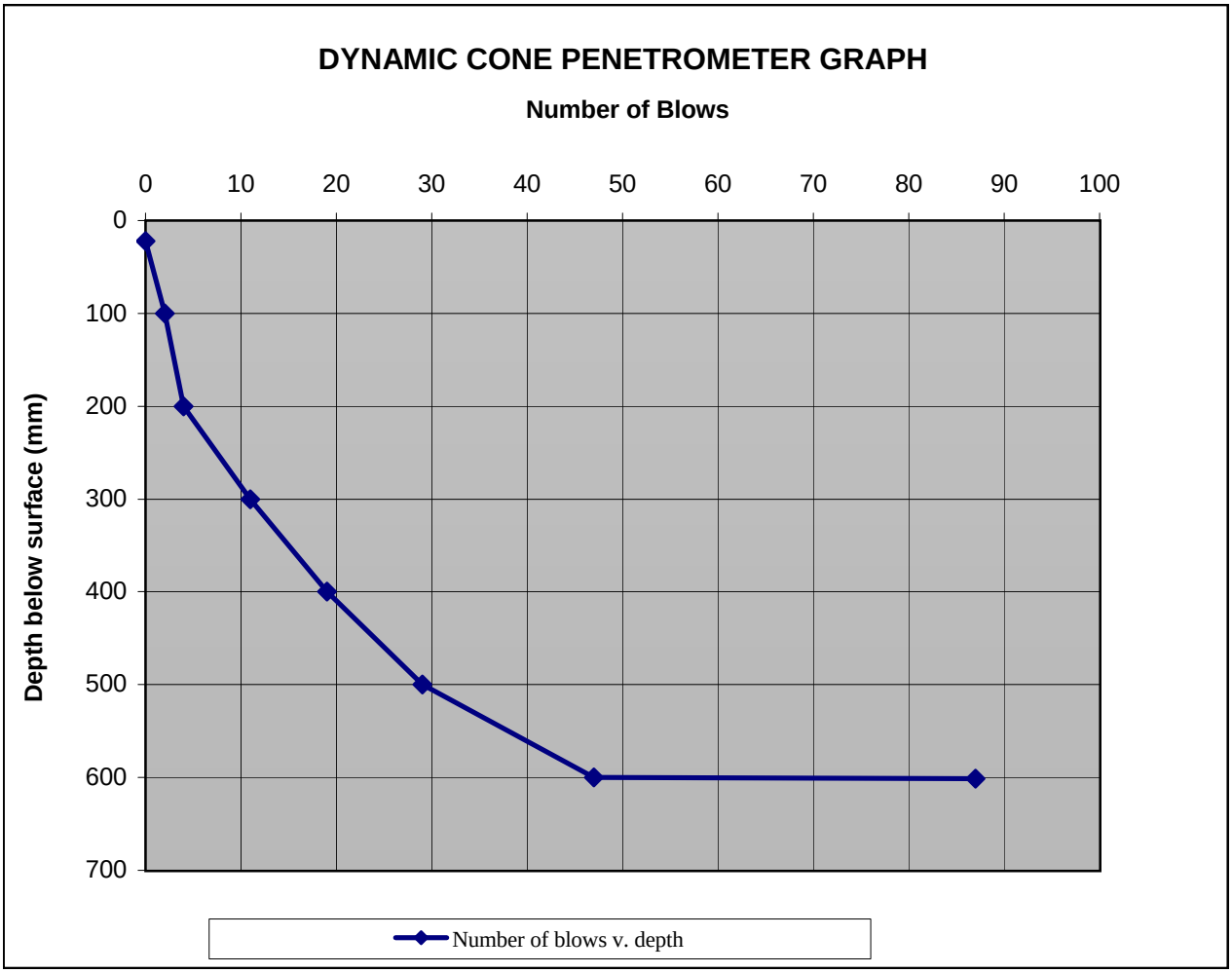
UKAS accredited test - No

Test abandoned due to refusal of test equipment; less than 4mm penetration in 40 blows

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B84 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	22/10/2024	Test Location	~
Tested by	JW	DCP No.	2
Weather	Variable	Zero Error (mm)	24



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
22	200	4	4	Unknown	44.50	5
200	600	47	43	Unknown	9.30	29
600	601	87	40	Unknown	0.03	14907

Remarks:

Cone Angle 60°

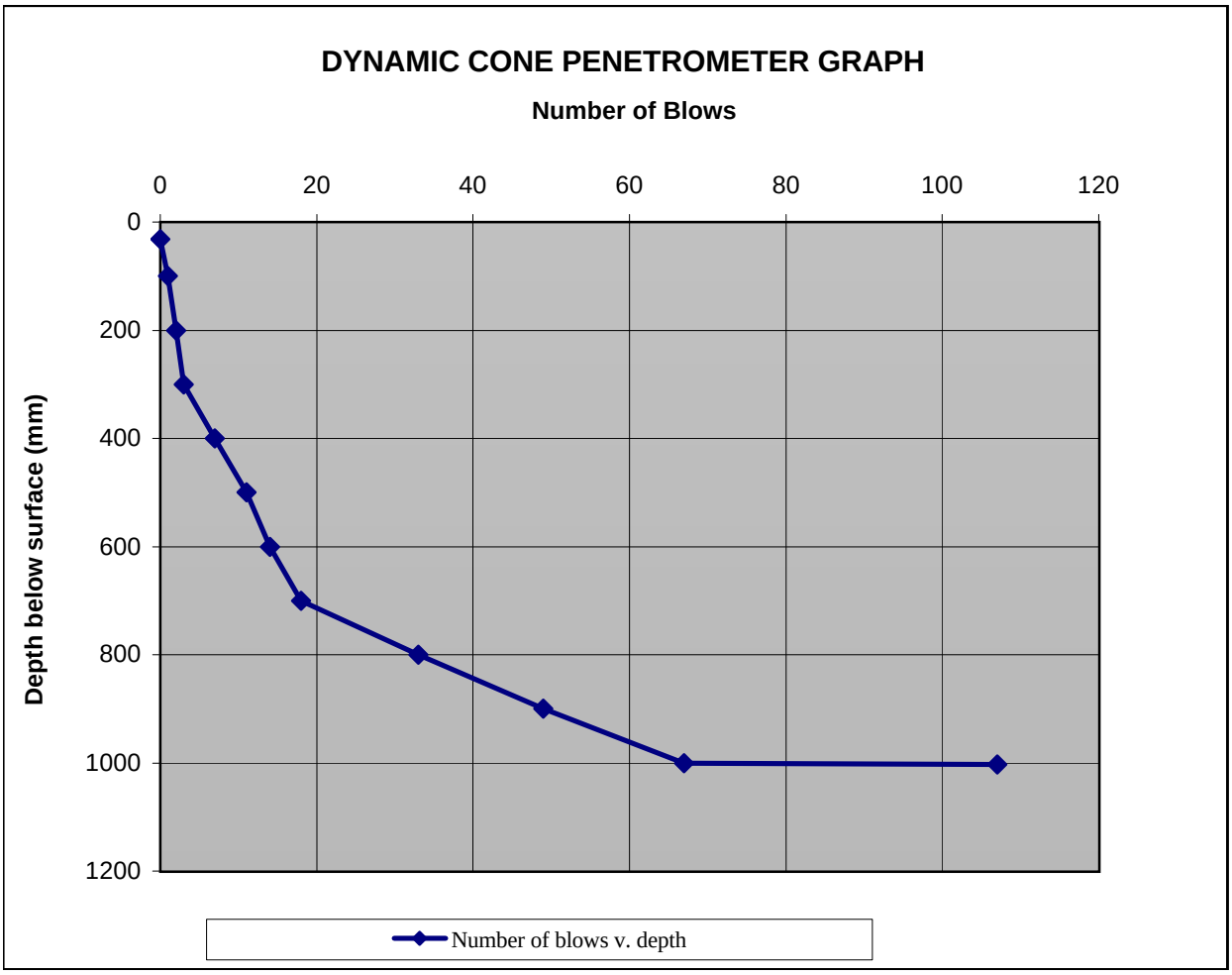
UKAS accredited test - No

Test abandoned due to refusal of test equipment; less than 4mm penetration in 40 blows

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B85 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	22/10/2024	Test Location	~
Tested by	JW	DCP No.	3
Weather	Variable	Zero Error (mm)	32



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
32	300	3	3	Unknown	89.33	3
300	700	18	15	Unknown	26.67	9
700	1000	67	49	Unknown	6.12	44
1000	1003	107	40	Unknown	0.08	4667

Remarks:

Cone Angle 60°

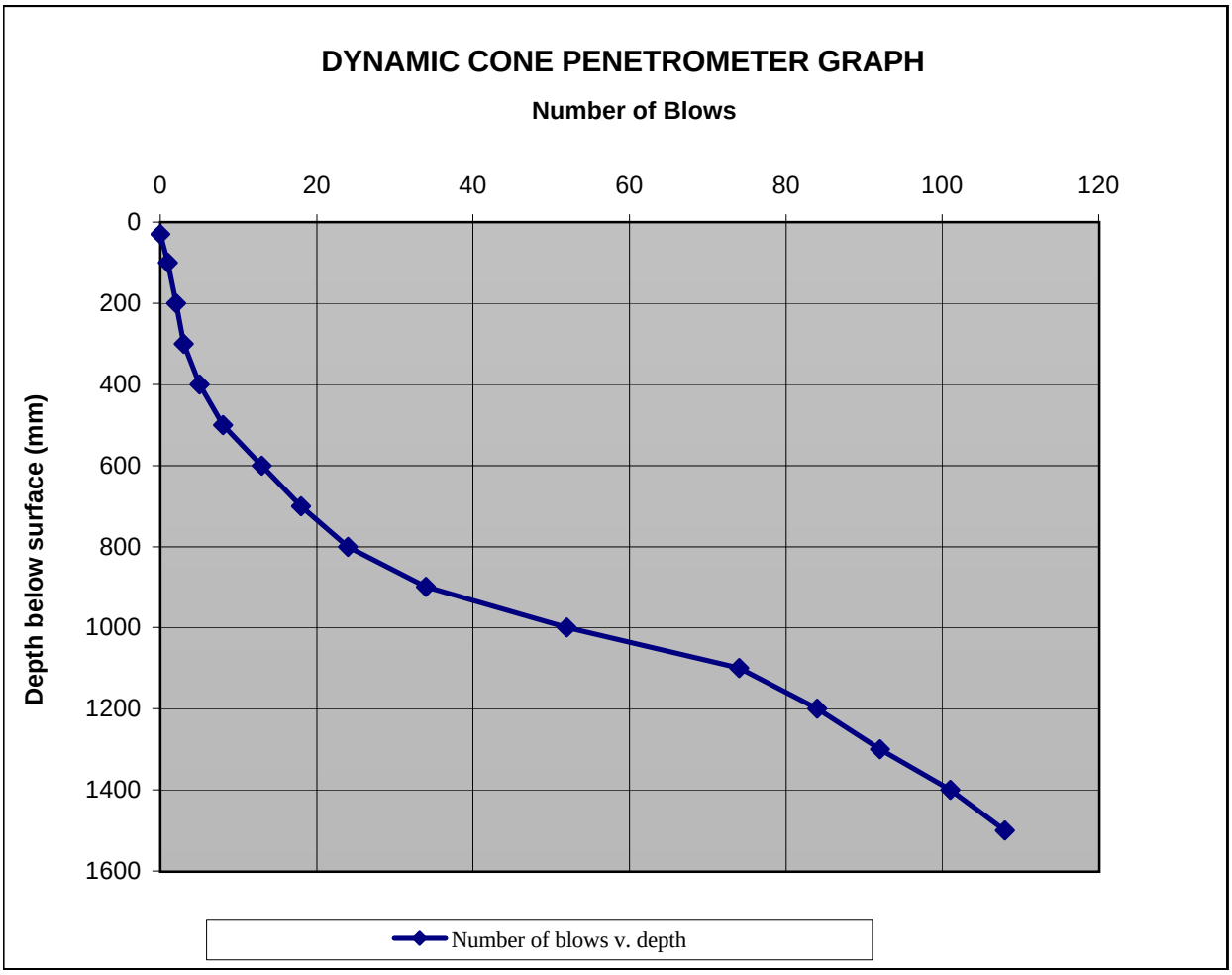
UKAS accredited test - No

Test abandoned due to refusal of test equipment; less than 4mm penetration in 40 blows

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B86 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	22/10/2024	Test Location	~
Tested by	JW	DCP No.	4
Weather	Variable	Zero Error (mm)	29



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
29	400	5	5	Unknown	74.20	3
400	900	34	29	Unknown	17.24	15
900	1100	74	40	Unknown	5.00	55
1100	1500	108	34	Unknown	11.76	22

Remarks:

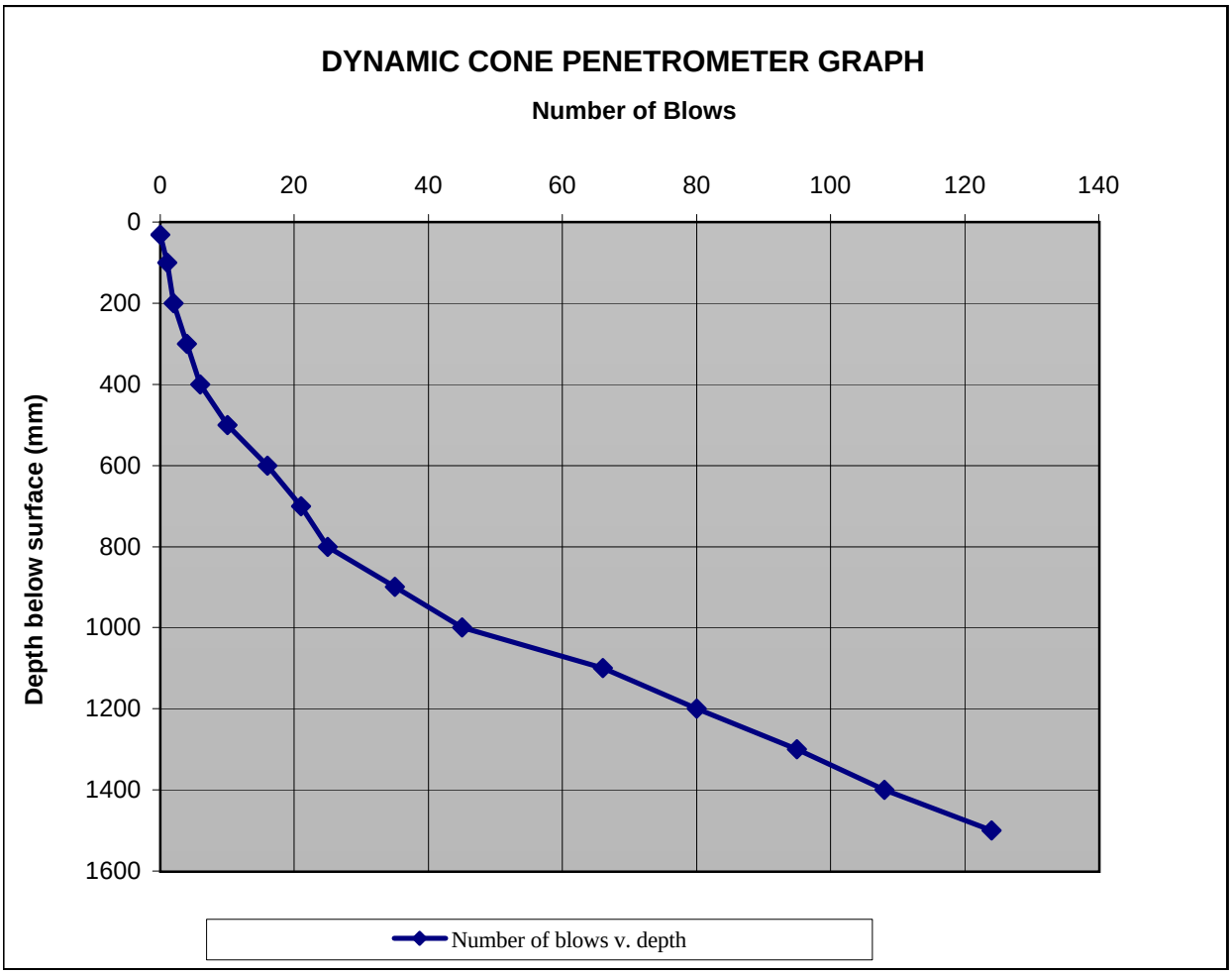
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B87 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	22/10/2024	Test Location	~
Tested by	JW	DCP No.	4
Weather	Variable	Zero Error (mm)	32



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
32	400	6	6	Unknown	61.33	4
400	800	25	19	Unknown	21.05	12
800	1100	66	41	Unknown	7.32	37
1100	1500	124	58	Unknown	6.90	39

Remarks:

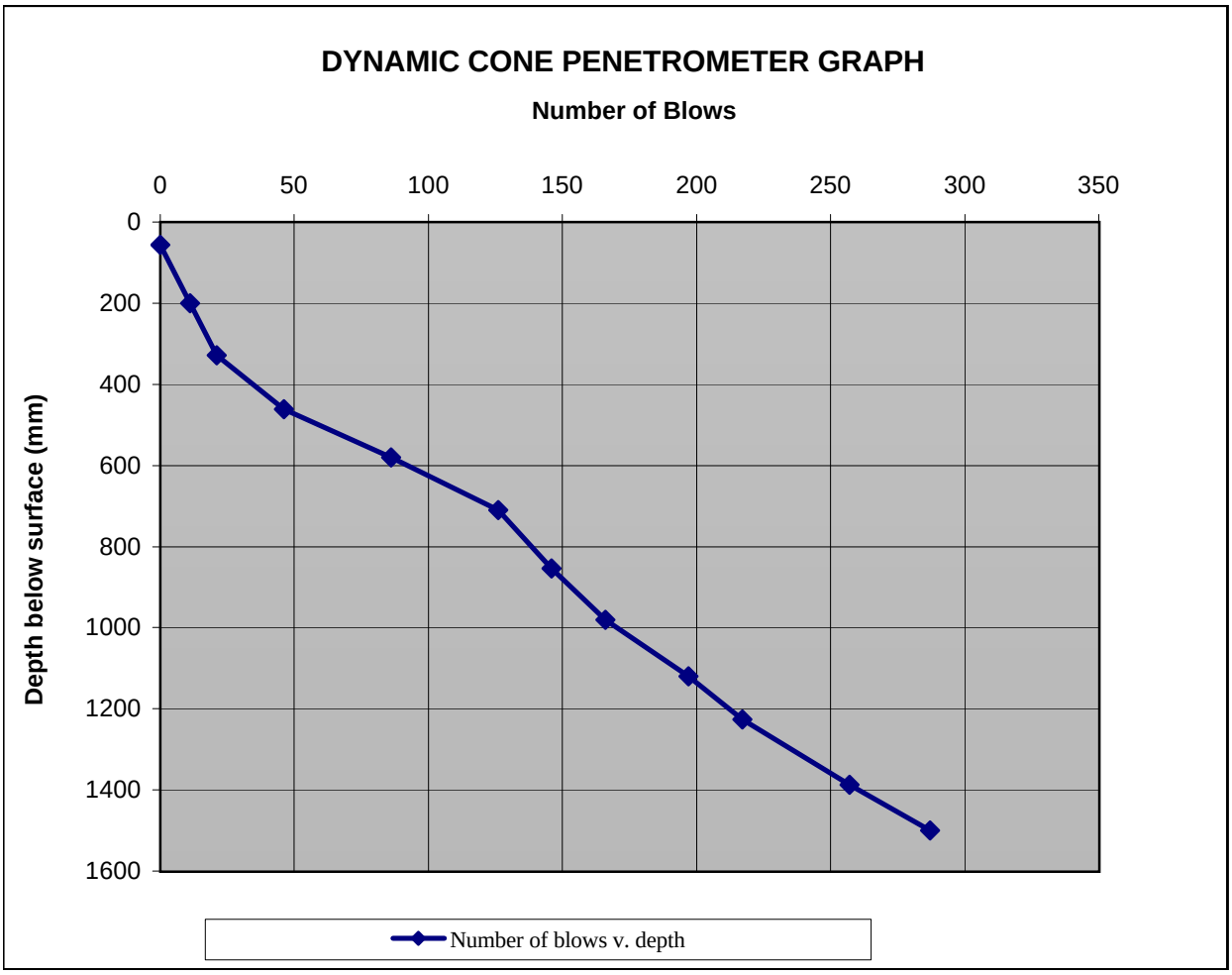
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B88 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	16/10/2024	Test Location	~
Tested by	JD	DCP No.	6
Weather	Variable	Zero Error (mm)	56



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
56	329	21	21	Unknown	13.00	20
329	461	46	25	Unknown	5.28	52
461	710	126	70	Unknown	3.56	79
710	1500	287	161	Unknown	4.91	56

Remarks:

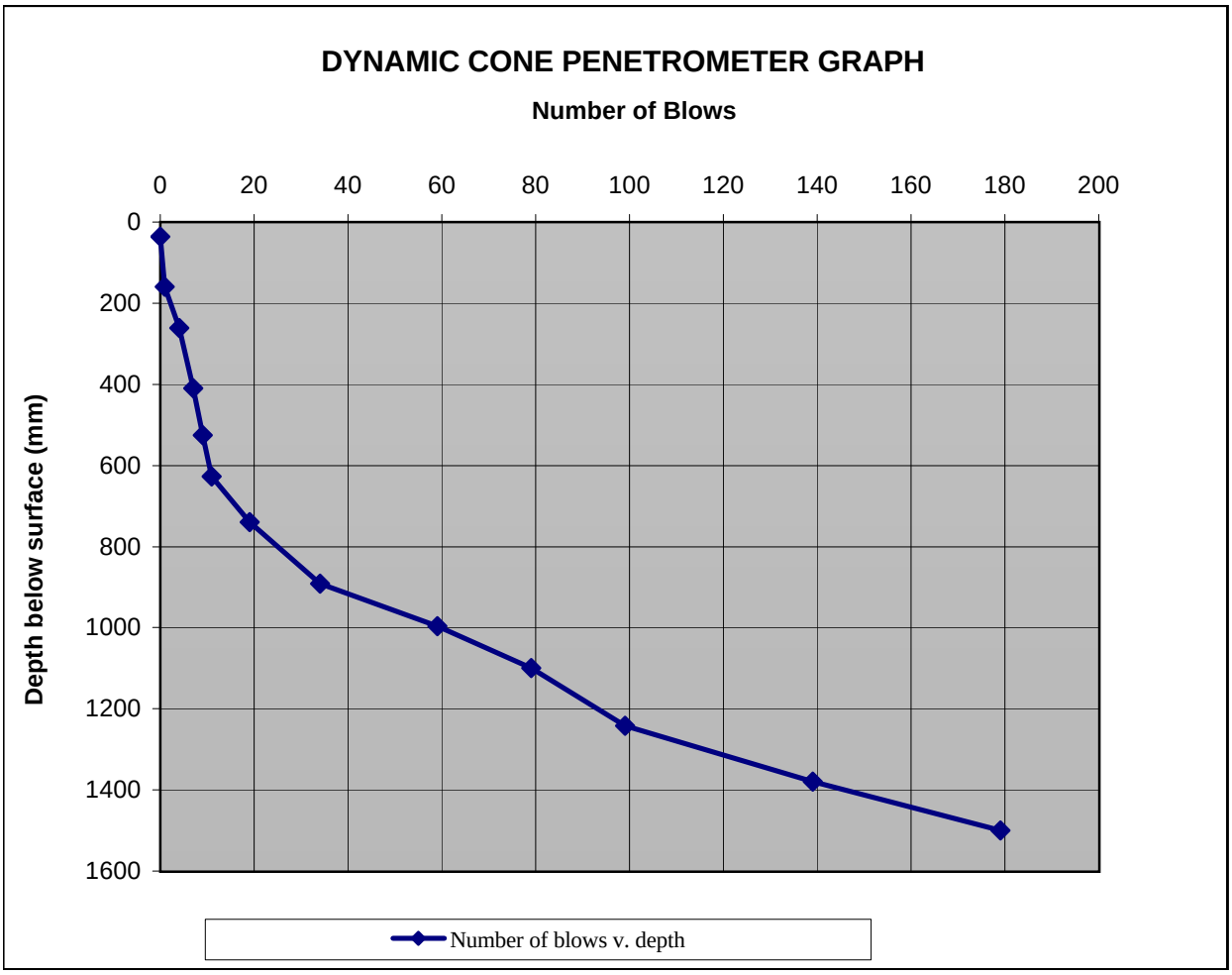
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B89 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	16/10/2024	Test Location	~
Tested by	JD	DCP No.	7
Weather	Variable	Zero Error (mm)	36



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
36	627	11	11	Unknown	53.73	4
627	892	34	23	Unknown	11.52	23
892	1242	99	65	Unknown	5.38	51
1242	1500	179	80	Unknown	3.23	88

Remarks:

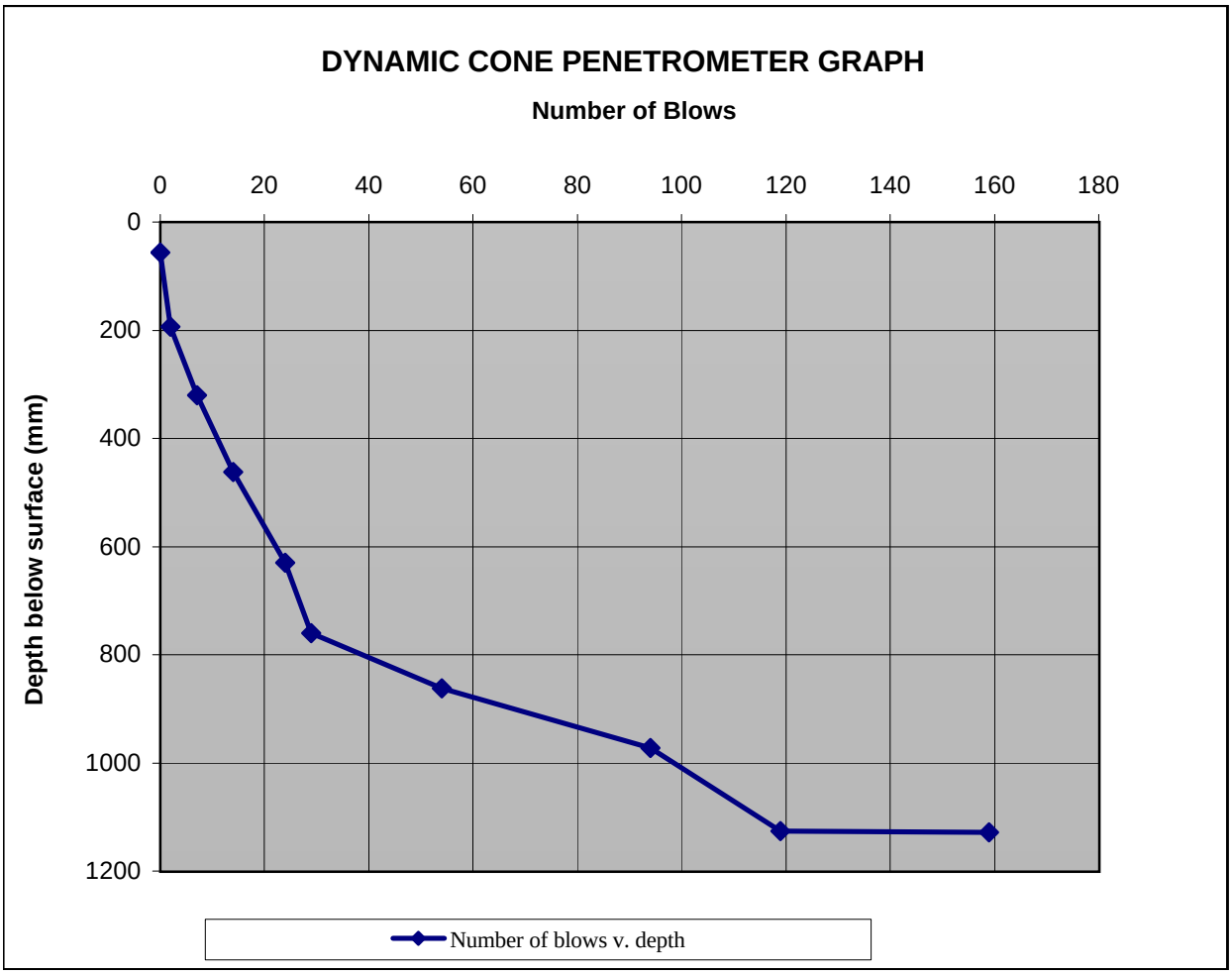
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B90 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	15/10/2024	Test Location	~
Tested by	JD	DCP No.	8
Weather	Variable	Zero Error (mm)	56



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
56	760	29	29	Unknown	24.28	10
760	972	94	65	Unknown	3.26	87
972	1126	119	25	Unknown	6.16	44
1126	1128	159	40	Unknown	0.05	7165

Remarks:

Cone Angle 60°

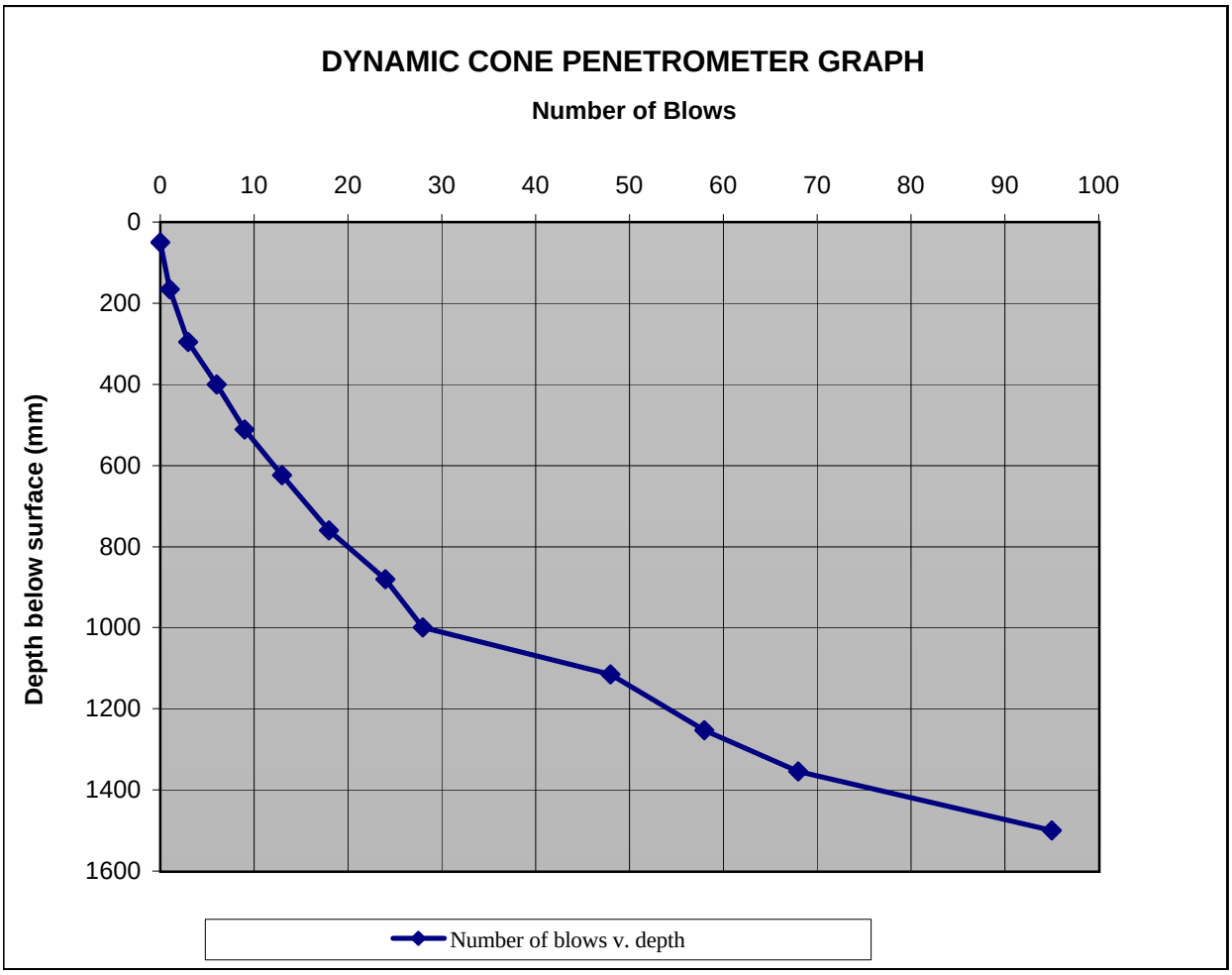
UKAS accredited test - No

Test abandoned due to refusal of test equipment; less than 4mm penetration in 40 blows

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B91 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	16/10/2024	Test Location	~
Tested by	JD	DCP No.	9
Weather	Variable	Zero Error (mm)	50



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
50	1000	28	28	Unknown	33.93	7
1000	1115	48	20	Unknown	5.75	48
1115	1355	68	20	Unknown	12.00	22
1355	1500	95	27	Unknown	5.37	51

Remarks:

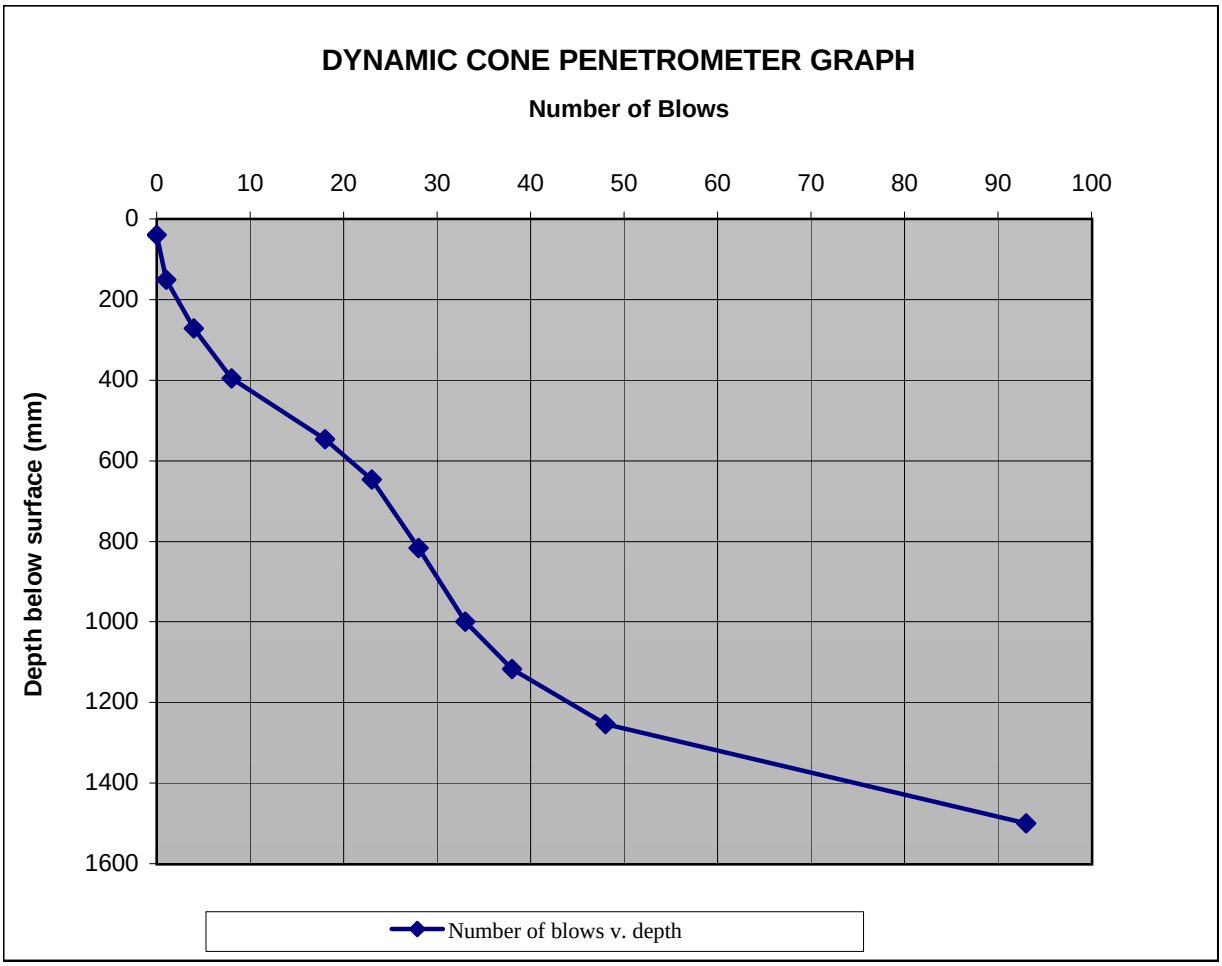
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B92 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	16/10/2024	Test Location	~
Tested by	JD	DCP No.	10
Weather	Variable	Zero Error (mm)	40



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
40	396	8	8	Unknown	44.50	5
396	647	23	15	Unknown	16.73	15
647	1000	33	10	Unknown	35.30	7
1000	1254	48	15	Unknown	16.93	15
1254	1500	93	45	Unknown	5.47	50

Remarks:

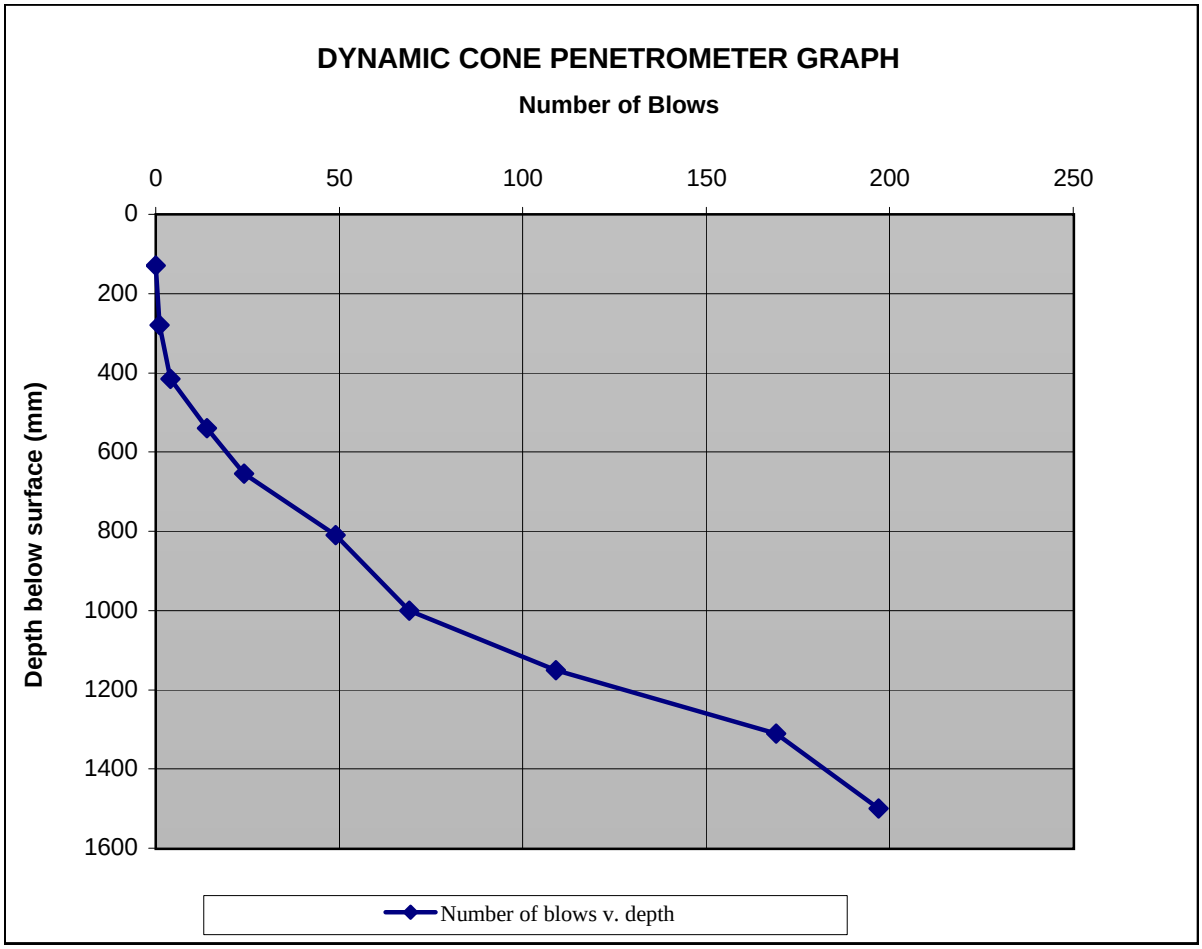
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B93 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	17/10/2024	Test Location	~
Tested by	JD	DCP No.	11
Weather	Variable	Zero Error (mm)	130



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
130	415	4	4	Unknown	71.25	3
415	655	24	20	Unknown	12.00	22
655	810	49	25	Unknown	6.20	44
810	1000	69	20	Unknown	9.50	28
1000	1310	169	100	Unknown	3.10	91
1310	1500	197	28	Unknown	6.79	40

Remarks:

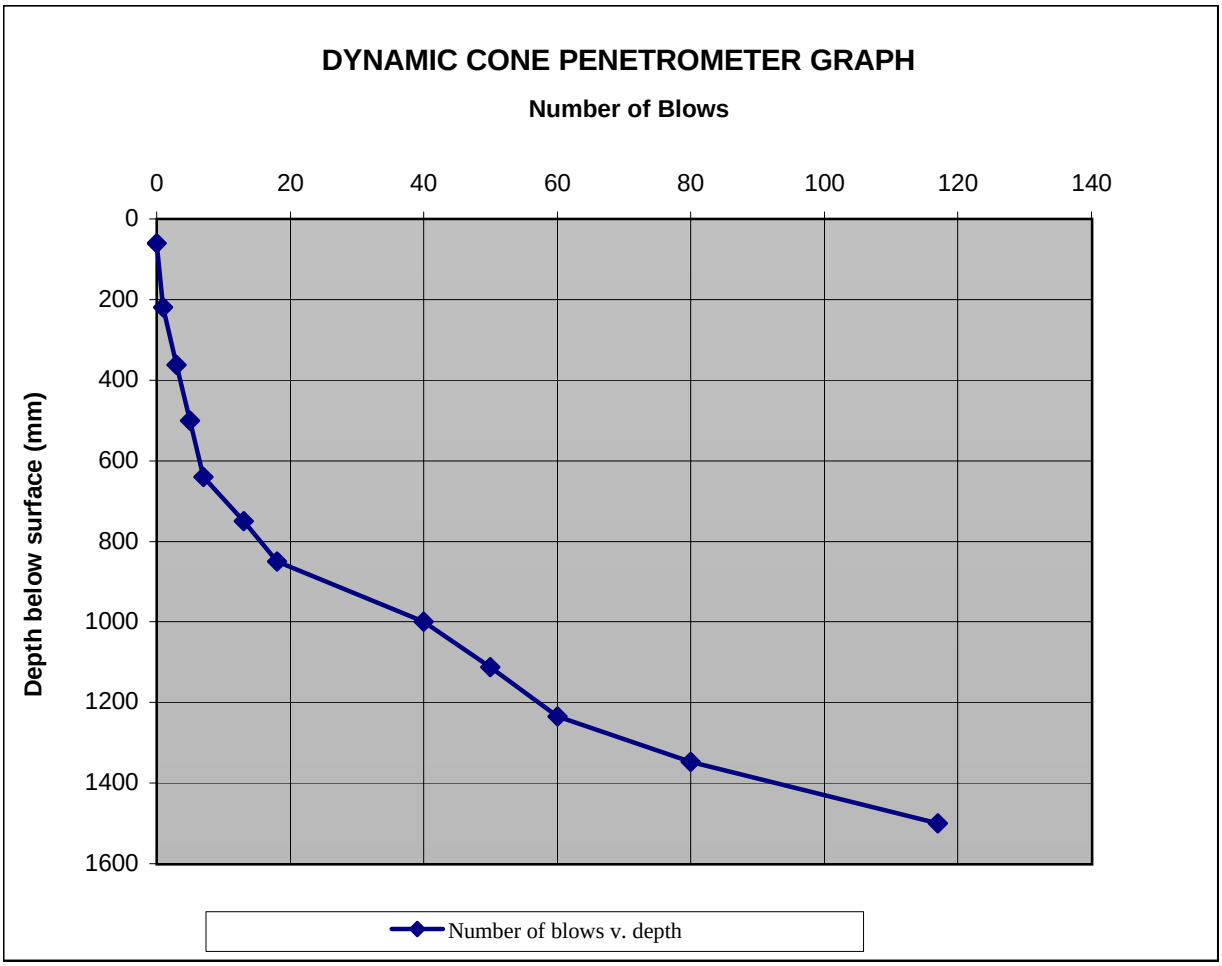
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B94 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD	**Contract No 26762**
	Client: Balfour Beatty	
	Engineer: WSP	

Date tested	17/10/2024	Test Location	~
Tested by	JD	DCP No.	12
Weather	Variable	Zero Error (mm)	60



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
60	640	7	7	Unknown	82.86	3
640	850	18	11	Unknown	19.09	13
850	1000	40	22	Unknown	6.82	40
1000	1234	60	20	Unknown	11.70	22
1234	1500	117	57	Unknown	4.67	59

Remarks:

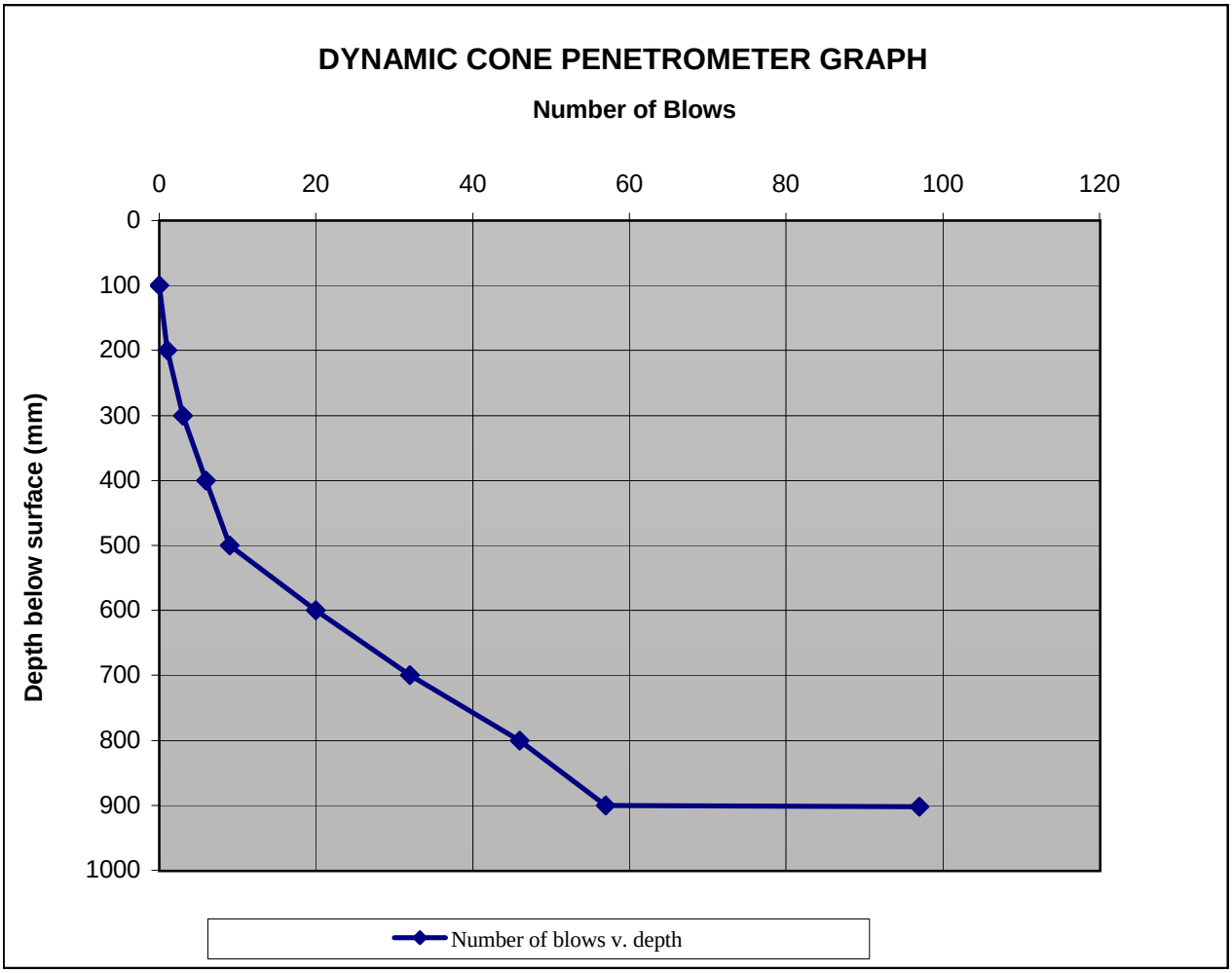
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B95 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	23/10/2024	Test Location	~
Tested by	JW	DCP No.	16
Weather	Variable	Zero Error (mm)	10



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
100	500	9	9	Unknown	44.44	5
500	900	57	48	Unknown	8.33	32
900	902	97	40	Unknown	0.05	7165

Remarks:

Cone Angle 60°

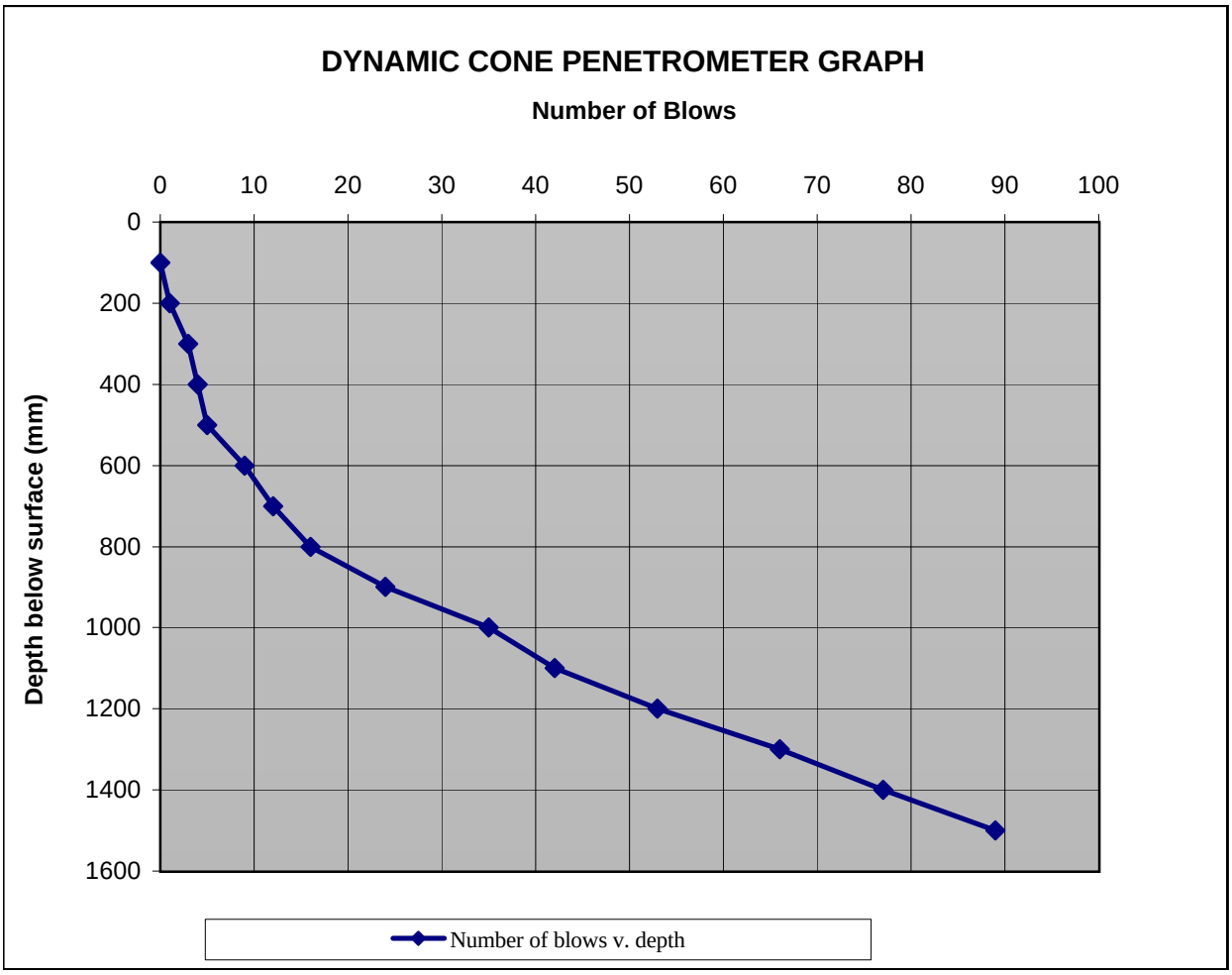
UKAS accredited test - No

Test abandoned due to refusal of test equipment; less than 4mm penetration in 40 blows

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B96 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	23/10/2024	Test Location	~
Tested by	JW	DCP No.	17
Weather	Variable	Zero Error (mm)	20



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
100	300	3	3	Unknown	66.67	4
300	500	5	2	Unknown	100.00	2
500	800	16	11	Unknown	27.27	9
800	1500	89	73	Unknown	9.59	28

Remarks:

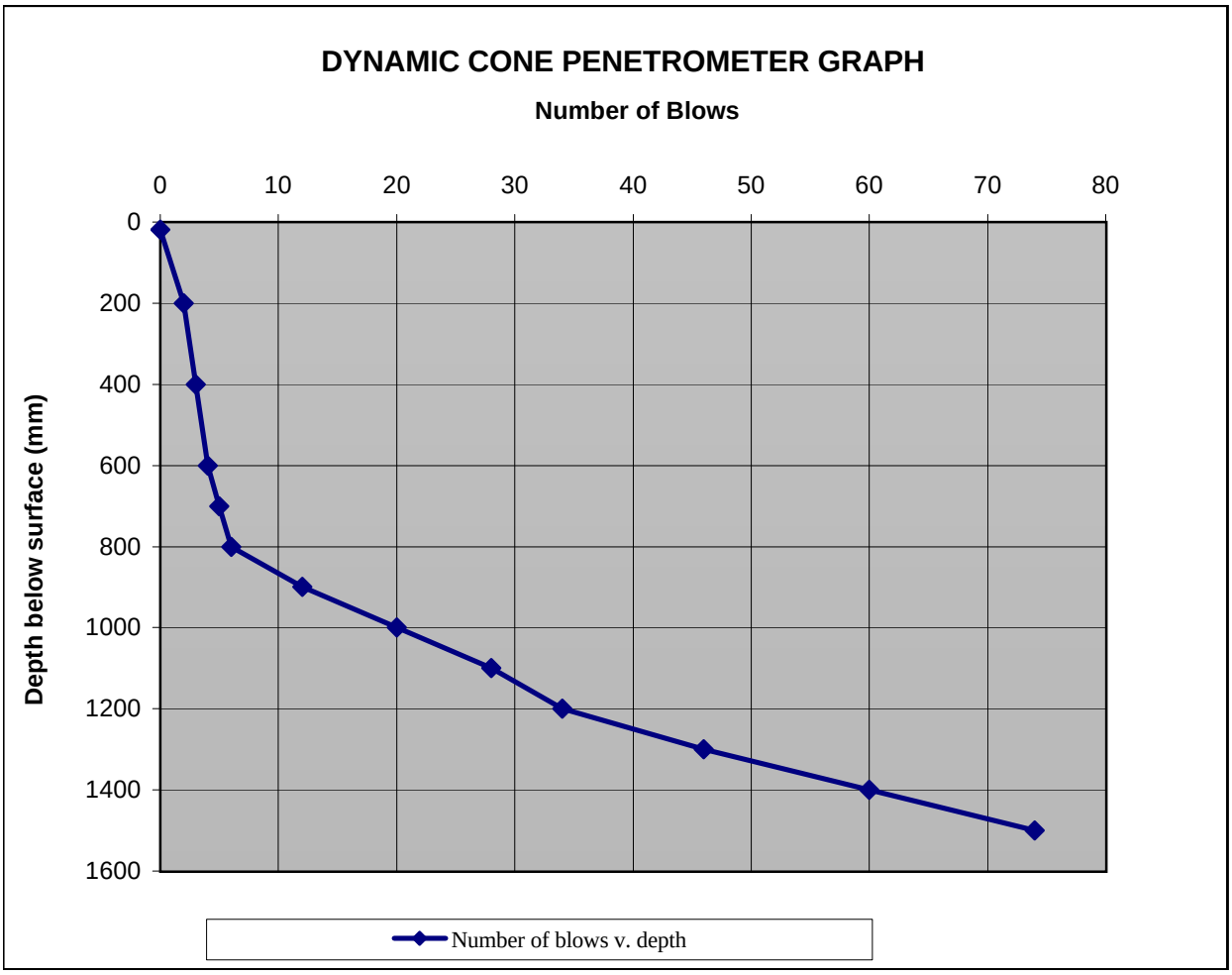
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B97 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	23/10/2024	Test Location	~
Tested by	JW	DCP No.	18
Weather	Variable	Zero Error (mm)	19



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
19	200	2	2	Unknown	90.50	3
200	800	6	4	Unknown	150.00	2
800	1200	34	28	Unknown	14.29	18
1200	1500	74	40	Unknown	7.50	36

Remarks:

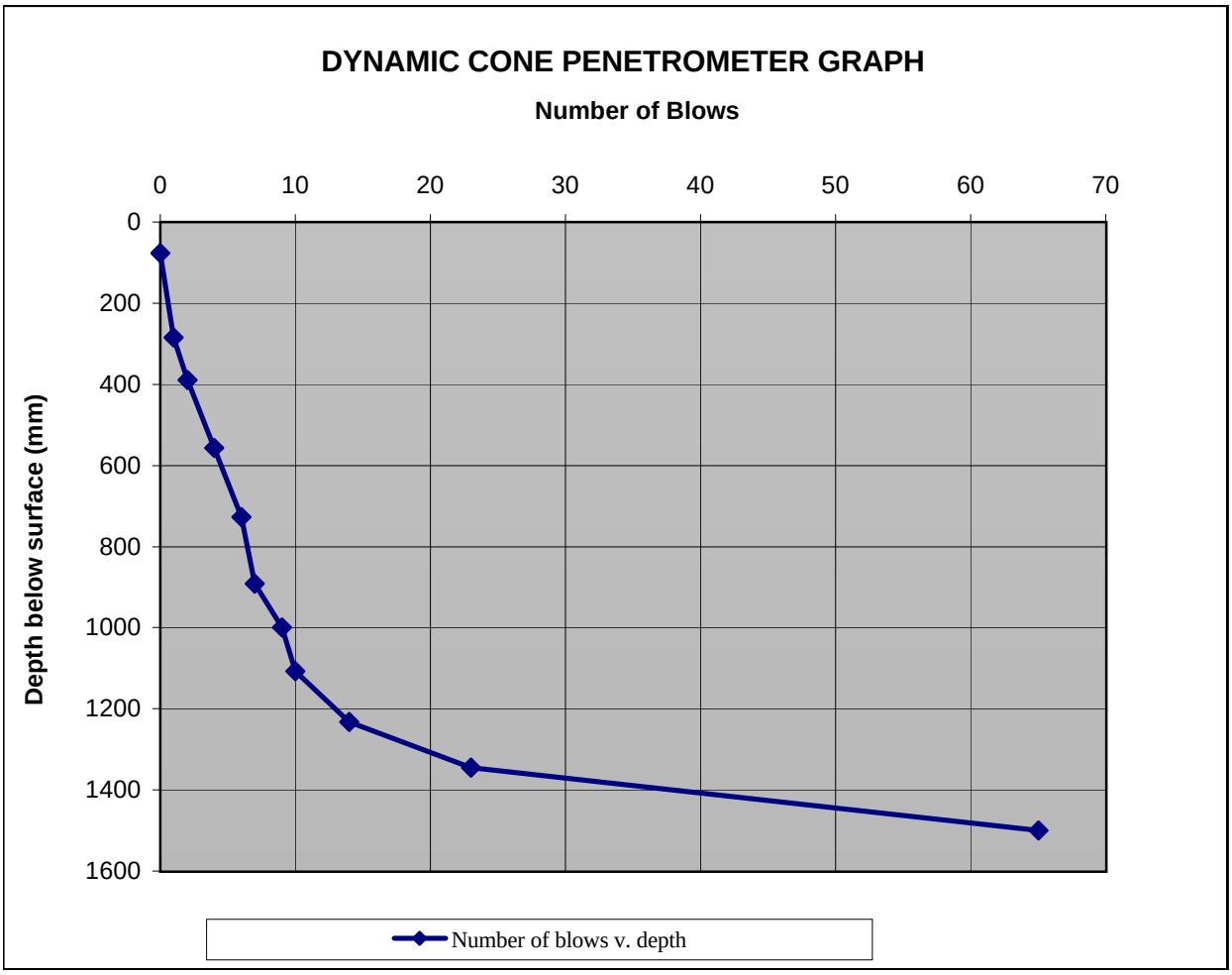
Cone Angle 60°

UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B98 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	17/10/2024	Test Location	~
Tested by	JD	DCP No.	19
Weather	Variable	Zero Error (mm)	76



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
76	1108	10	10	Unknown	103.20	2
1108	1232	14	4	Unknown	31.00	8
1232	1345	23	9	Unknown	12.56	21
1345	1500	65	42	Unknown	3.69	76

Remarks:

Cone Angle 60°

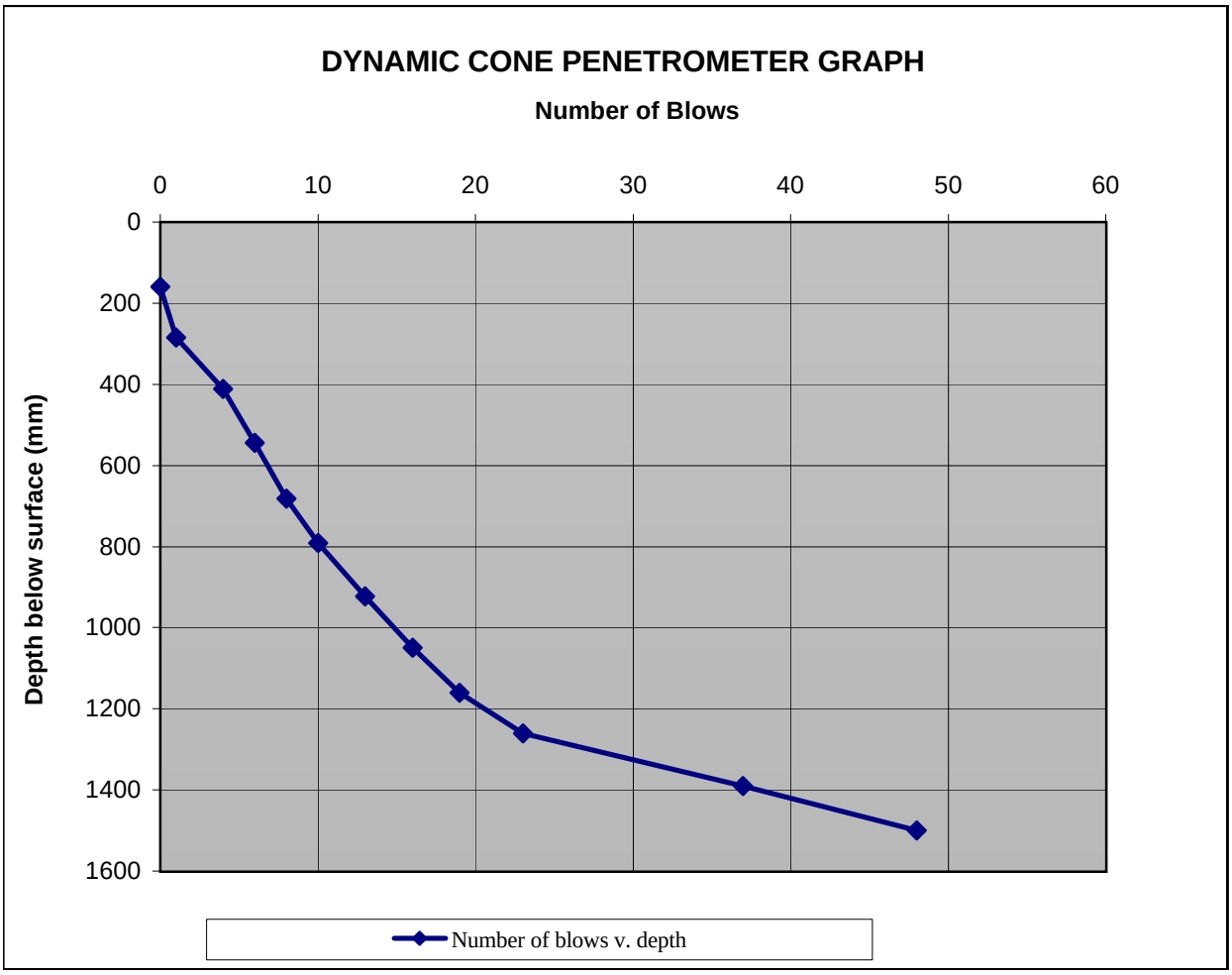
UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B99 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested 17/10/2024
Tested by JD
Weather Variable

Test Location ~
DCP No. 20
Zero Error (mm) 160



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
160	284	1	1	Unknown	124.00	2
284	412	4	3	Unknown	42.67	6
412	1260	23	19	Unknown	44.63	5
1260	1500	48	25	Unknown	9.60	28

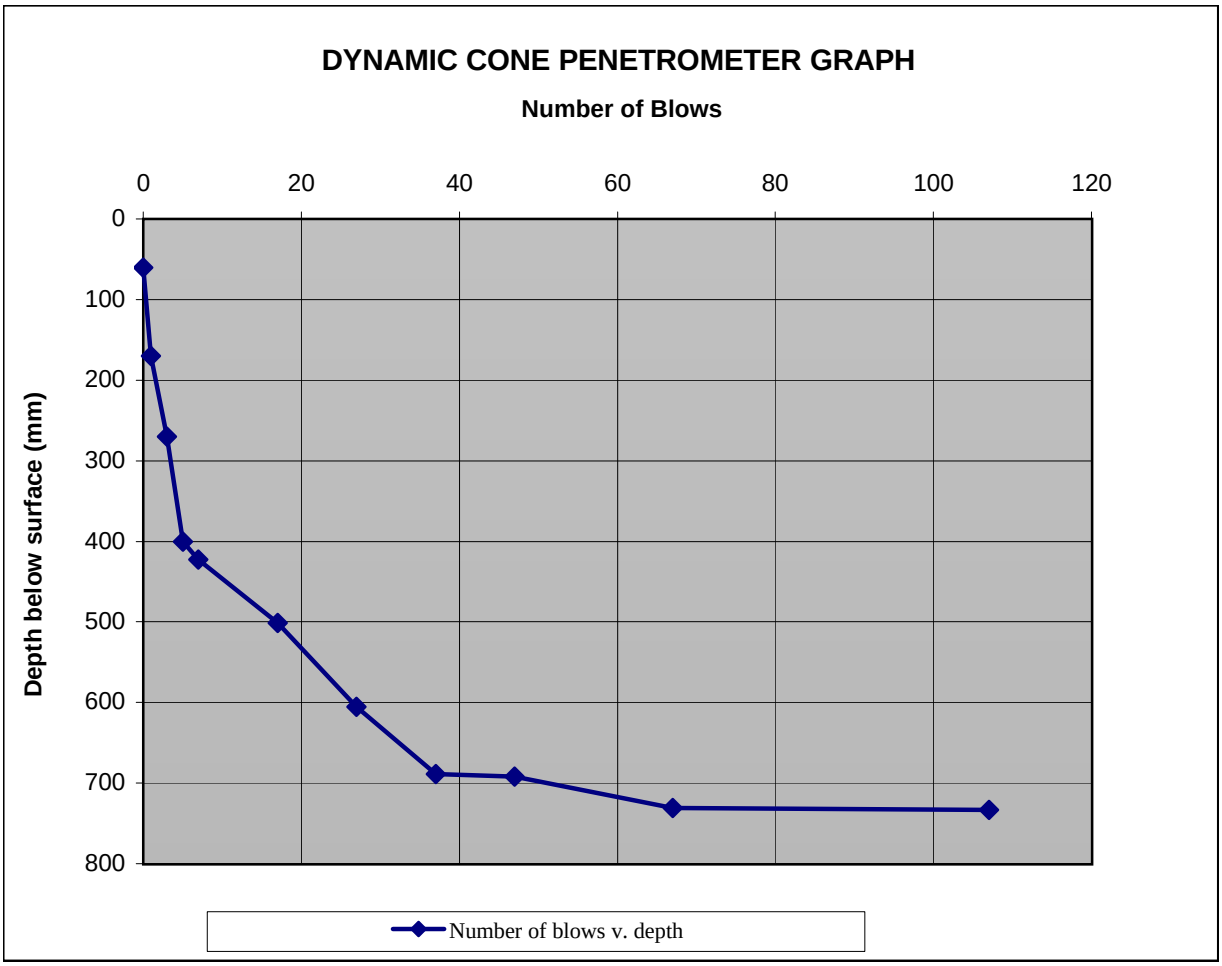
Remarks:

Cone Angle 60°
UKAS accredited test - No

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B100

igne	Site: CAMBUSHINNIE HAUL ROAD	**Contract No 26762**
	Client: Balfour Beatty	
	Engineer: WSP	

Date tested	18/10/2024	Test Location	~
Tested by	JD	DCP No.	21
Weather	Variable	Zero Error (mm)	60



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
60	400	5	5	Unknown	68.00	3
400	689	37	32	Unknown	9.03	29
689	692	47	10	Unknown	0.30	1078
692	731	67	20	Unknown	1.95	149
731	733	107	40	Unknown	0.05	7165

Remarks:

Cone Angle 60°

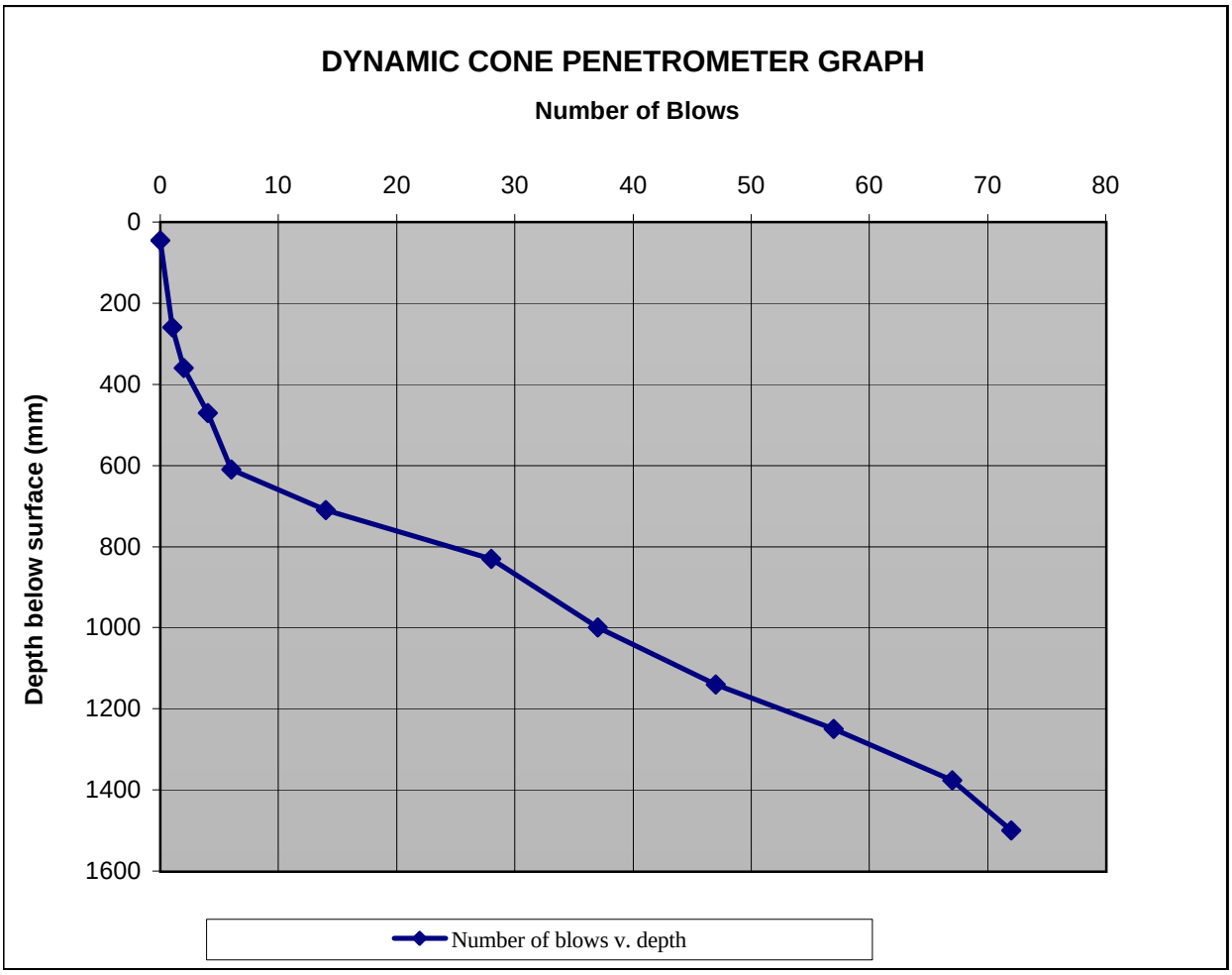
UKAS accredited test - No

Test abandoned due to refusal of test equipment; less than 4mm penetration in 40 blows

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B101 Sheet 1 of 1

igne	Site: CAMBUSHINNIE HAUL ROAD Client: Balfour Beatty Engineer: WSP	**Contract No 26762**

Date tested	17/10/2024	Test Location	~
Tested by	JD	DCP No.	22
Weather	Variable	Zero Error (mm)	45



Start Depth (mm)	Finish Depth (mm)	No. of Blows	Blows per Layer	Material	DCP mm/blow	Estimated average CBR over depth range (%)
45	610	6	6	Unknown	94.17	2
610	830	28	22	Unknown	10.00	26
830	1376	67	39	Unknown	14.00	19
1376	1500	72	5	Unknown	24.80	10

Remarks:

Cone Angle 60°

UKAS accredited test - No

Test abandoned due to refusal of test equipment; less than 4mm penetration in 40 blows

Originator	Checked & Approved	Dynamic Cone Penetrometer	
CL	CD 13/12/2024	In-house procedure TP166 with reference to CS 229 cl 6 of the DMRB	B102 Sheet 1 of 1

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

Engineer: Balfour Beatty

* 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 (mAOD)	Remarks
					CH_4 (%vol)	CO_2 (%vol)	O_2 (%vol)	H_2S (ppm)	CO (ppm)					
BH01			21/11/24 11:34	983	0.00	0.20	20.20	0.00	1.00	0.00	0.00	3.30		Dry, hazy, cool
			21/11/24 11:35		0.00	3.90	14.10	0.00	3.00					Dry, hazy, cool
			21/11/24 11:36		0.00	4.00	13.40	0.00	1.00					Dry, hazy, cool
			21/11/24 11:37		0.00	4.00	13.20	0.00	1.00					Dry, hazy, cool
			21/11/24 11:38		0.00	4.10	13.10	0.00	5.00					Dry, hazy, cool
			21/11/24 11:39		0.00	4.10	13.10	0.00	3.00					Dry, hazy, cool
			03/12/24 13:24	1008	0.00	0.50	20.00	0.00	0.00	0.00	0.00	3.17		Dry, sunny, mild
			03/12/24 13:25		0.00	3.70	15.80	0.00	0.00					Dry, sunny, mild
			03/12/24 13:26		0.00	3.90	13.40	0.00	0.00					Dry, sunny, mild
			03/12/24 13:27		0.00	3.90	13.00	0.00	1.00					Dry, sunny, mild
			03/12/24 13:28		0.00	3.90	12.90	0.00	1.00					Dry, sunny, mild
			03/12/24 13:29		0.00	3.90	12.90	0.00	0.00					Dry, sunny, mild
			10/12/24 09:17	1028	0.00	0.00	20.00	0.00	3.00	0.00	0.00	2.83		Dry, sunny, cold
			10/12/24 09:18		0.00	4.00	13.30	0.00	1.00					Dry, sunny, cold
			10/12/24 09:19		0.00	4.10	12.30	0.00	0.00					Dry, sunny, cold
			10/12/24 09:20		0.00	4.10	12.10	0.00	0.00					Dry, sunny, cold
			10/12/24 09:21		0.00	4.10	12.10	0.00	0.00					Dry, sunny, cold
			10/12/24 09:22		0.00	4.10	12.10	0.00	0.00					Dry, sunny, cold
BH02			21/11/24 12:11	982	0.00	3.60	16.80	0.00	0.00	0.00	0.00	2.73		Dry, hazy, cool
			21/11/24 12:12		0.00	2.10	18.40	0.00	0.00					Dry, hazy, cool
			21/11/24 12:13		0.00	2.10	18.60	0.00	1.00					Dry, hazy, cool
			21/11/24 12:14		0.00	2.10	18.60	0.00	0.00					Dry, hazy, cool
			21/11/24 12:15		0.00	2.10	18.60	0.00	1.00					Dry, hazy, cool
			21/11/24 12:16		0.00	2.10	18.70	0.00	1.00					Dry, hazy, cool
			03/12/24 11:52	1008	0.00	0.00	19.80	0.00	0.00	0.00	0.00	2.45		Dry, sunny, mild
			03/12/24 11:53		0.00	0.90	20.10	0.00	0.00					Dry, sunny, mild
			03/12/24 11:54		0.00	2.20	19.00	0.00	0.00					Dry, sunny, mild
			03/12/24 11:55		0.00	2.40	18.40	0.00	0.00					Dry, sunny, mild
			03/12/24 11:56		0.00	2.60	18.20	0.00	0.00					Dry, sunny, mild
			03/12/24 11:57		0.00	2.60	18.20	0.00	1.00					Dry, sunny, mild
			10/12/24 10:45	1028	0.00	3.10	17.30	0.00	0.00	0.00	0.00	2.27		Dry, sunny, cold
			10/12/24 10:46		0.00	1.90	17.70	0.00	0.00					Dry, sunny, cold
			10/12/24 10:47		0.00	1.90	17.90	0.00	0.00					Dry, sunny, cold
			10/12/24 10:48		0.00	1.90	17.90	0.00	0.00					Dry, sunny, cold
			10/12/24 10:49		0.00	1.90	17.90	0.00	0.00					Dry, sunny, cold
			10/12/24 10:50		0.00	1.90	17.90	0.00	0.00					Dry, sunny, cold
WS01			21/11/24 12:28	982	0.00	2.00	18.40	0.00	0.00	0.00	0.00	1.99		Dry, hazy, cool
			21/11/24 12:29		0.00	4.50	17.10	0.00	0.00					Dry, hazy, cool
			21/11/24 12:30		0.00	4.50	16.90	0.00	0.00					Dry, hazy, cool
			21/11/24 12:31		0.00	4.70	18.60	0.00	1.00					Dry, hazy, cool
			21/11/24 12:32		0.00	4.80	16.80	0.00	0.00					Dry, hazy, cool
			21/11/24 12:33		0.00	4.80	16.70	0.00	1.00					Dry, hazy, cool
			03/12/24 00:00											No gas test possible as gas
														valve removed

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Originator	Title:	Fig No:
JMcM	RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES	B103
Chk & App: CJH	Status: Final	Sheet 1 of 3

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

Engineer: Balfour Beatty

* 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 (mAOD)	Remarks
					CH_4 (%vol)	CO_2 (%vol)	O_2 (%vol)	H_2S (ppm)	CO (ppm)					
WS01			03/12/24 00:00									1.19		Dry, sunny, mild
			10/12/24 11:10	1027	0.00	1.90	17.90	0.00	0.00	0.00	0.00	0.76		Dry, sunny, cold
			10/12/24 11:11		0.00	3.30	17.20	0.00	0.00					Dry, sunny, cold
			10/12/24 11:12		0.00	3.30	17.20	0.00	0.00					Dry, sunny, cold
			10/12/24 11:13		0.00	3.30	17.10	0.00	0.00					Dry, sunny, cold
			10/12/24 11:14		0.00	3.30	17.10	0.00	0.00					Dry, sunny, cold
			10/12/24 11:15		0.00	3.30	17.10	0.00	0.00					Dry, sunny, cold
WS02			21/11/24 12:45	982	0.00	4.30	17.50	0.00	0.00	0.00	0.00	0.91		Dry, hazy, cool
			21/11/24 12:46		0.00	6.20	16.20	0.00	0.00					Dry, hazy, cool
			21/11/24 12:47		0.00	6.20	16.20	0.00	0.00					Dry, hazy, cool
			21/11/24 12:48		0.00	6.20	16.20	0.00	0.00					Dry, hazy, cool
			21/11/24 12:49		0.00	6.30	16.10	0.00	0.00					Dry, hazy, cool
			21/11/24 12:50		0.00	6.30	16.10	0.00	0.00					Dry, hazy, cool
			03/12/24 12:16	1008	0.00	0.50	19.90	0.00	0.00	0.00	0.00	0.35		Dry, sunny, mild
			03/12/24 12:17		0.00	0.80	20.20	0.00	0.00					Dry, sunny, mild
			03/12/24 12:18		0.00	1.50	20.10	0.00	0.00					Dry, sunny, mild
			03/12/24 12:19		0.00	1.60	20.20	0.00	0.00					Dry, sunny, mild
			03/12/24 12:20		0.00	1.60	20.20	0.00	0.00					Dry, sunny, mild
			03/12/24 12:21		0.00	1.60	20.10	0.00	0.00					Dry, sunny, mild
			10/12/24 12:38	1027	0.00	2.00	18.40	0.00	0.00	0.00	0.00	0.68		Dry, sunny, cold
			10/12/24 12:39		0.00	0.70	20.00	0.00	0.00					Dry, sunny, cold
			10/12/24 12:40		0.00	0.40	20.40	0.00	0.00					Dry, sunny, cold
			10/12/24 12:41		0.00	0.30	20.50	0.00	0.00					Dry, sunny, cold
			10/12/24 12:42		0.00	0.30	20.60	0.00	0.00					Dry, sunny, cold
			10/12/24 12:43		0.00	0.40	20.00	0.00	0.00					Dry, sunny, cold
WS03			21/11/24 13:00	982	0.00	6.00	16.80	0.00	0.00	0.00	0.00	0.16		Dry, hazy, cool
			21/11/24 13:01		0.00	0.70	19.60	0.00	0.00					Dry, hazy, cool
			21/11/24 13:02											Test stopped due to ingress
														of water
			03/12/24 12:30	1006	0.00	0.40	20.10	0.00	0.00	0.00	0.00	GL		Dry, sunny, mild
			03/12/24 12:31											Test stopped due to water
														ingress
			10/12/24 12:03	1027	0.00	2.00	17.70	0.00	0.00	0.00	0.00	GL		Dry, sunny, cold
			10/12/24 12:04											Test stopped due to water
														ingress
WS04			21/11/24 13:16	982	0.00	0.60	18.90	0.00	1.00	0.00	0.00	0.81		Dry, hazy, cool
			21/11/24 13:17		0.00	0.60	20.10	0.00	0.00					Dry, hazy, cool
			21/11/24 13:18		0.00	0.50	20.30	0.00	0.00					Dry, hazy, cool
			21/11/24 13:19		0.00	0.50	20.50	0.00	1.00					Dry, hazy, cool
			21/11/24 13:20		0.00	0.40	20.50	0.00	1.00					Dry, hazy, cool
			21/11/24 13:21		0.00	0.30	20.50	0.00	0.00					Dry, hazy, cool
			03/12/24 12:51	1006	0.00	0.00	19.60	0.00	0.00	0.00	0.00	0.65		Dry, sunny, mild
			03/12/24 12:52		0.00	0.40	19.80	0.00	0.00					Dry, sunny, mild
			03/12/24 12:53		0.00	0.60	20.00	0.00	0.00					Dry, sunny, mild

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Originator	Chk & App	Status
JMcM	CJH	Final

Title: RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES

Fig No: B103

Site: CAMBUSHINNIE 400KV SUBSTATION

Contract No: 26762

Client: Balfour Beatty

Engineer: Balfour Beatty

* 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 (mAOD)	Remarks
					CH_4 (%vol)	CO_2 (%vol)	O_2 (%vol)	H_2S (ppm)	CO (ppm)					
WS04			03/12/24 12:54		0.00	0.70	20.10	0.00	0.00					Dry, sunny, mild
			03/12/24 12:55		0.00	0.70	20.10	0.00	0.00					Dry, sunny, mild
			03/12/24 12:56		0.00	0.80	20.20	0.00	1.00					Dry, sunny, mild
			10/12/24 13:47	1027	0.00	0.30	19.60	0.00	0.00	0.00	0.00	0.59		Dry, sunny, cold
			10/12/24 13:48		0.00	0.50	19.90	0.00	0.00					Dry, sunny, cold
			10/12/24 13:49		0.00	0.50	19.90	0.00	0.00					Dry, sunny, cold
			10/12/24 13:50		0.00	0.50	19.90	0.00	0.00					Dry, sunny, cold
			10/12/24 13:51		0.00	0.50	20.00	0.00	0.00					Dry, sunny, cold
			10/12/24 13:52		0.00	0.40	20.00	0.00	0.00					Dry, sunny, cold
WS06			21/11/24 13:34	980	0.00	0.00	19.90	0.00	0.00	0.00	0.00	0.53		Dry, sunny, cool
			21/11/24 13:35		0.00	0.50	20.50	0.00	0.00					Dry, sunny, cool
			21/11/24 13:36		0.00	0.40	20.60	0.00	0.00					Dry, sunny, cool
			21/11/24 13:37		0.00	0.30	20.70	0.00	0.00					Dry, sunny, cool
			21/11/24 13:38		0.00	0.20	20.70	0.00	0.00					Dry, sunny, cool
			21/11/24 13:39		0.00	0.10	20.70	0.00	1.00					Dry, sunny, cool
			03/12/24 14:35	1005	0.00	0.80	18.90	0.00	0.00	0.00	0.00	0.23		Dry, sunny, mild
			03/12/24 14:36		0.00	0.70	20.00	0.00	0.00					Dry, sunny, mild
			03/12/24 14:37		0.00	0.70	20.20	0.00	0.00					Dry, sunny, mild
			03/12/24 14:38		0.00	0.60	20.40	0.00	0.00					Dry, sunny, mild
			03/12/24 14:39		0.00	0.50	20.40	0.00	0.00					Dry, sunny, mild
			03/12/24 14:40		0.00	0.50	20.40	0.00	0.00					Dry, sunny, mild
			10/12/24 14:30	1024	0.00	0.40	19.70	0.00	0.00	0.00	0.00	0.25		Dry, sunny, cold
			10/12/24 14:31		0.00	0.00	20.60	0.00	0.00					Dry, sunny, cold
			10/12/24 14:32		0.00	0.00	20.70	0.00	1.00					Dry, sunny, cold
			10/12/24 14:33		0.00	0.00	20.70	0.00	0.00					Dry, sunny, cold
			10/12/24 14:34											Test stopped due to water
														ingress
WS07			21/11/24 13:51	979	0.00	0.00	20.30	0.00	0.00	0.00	0.00	0.61		Dry, sunny, cool
			21/11/24 13:52		0.00	0.00	20.60	0.00	0.00					Dry, sunny, cool
			21/11/24 13:53		0.00	0.00	20.60	0.00	0.00					Dry, sunny, cool
			21/11/24 13:54		0.00	0.00	20.60	0.00	0.00					Dry, sunny, cool
			21/11/24 13:55		0.00	0.00	20.70	0.00	0.00					Dry, sunny, cool
			21/11/24 13:56		0.00	0.00	20.60	0.00	0.00					Dry, sunny, cool
			03/12/24 14:18	1005	0.00	3.60	17.60	0.00	0.00	0.00	0.00	0.45		Dry, sunny, mild
			03/12/24 14:19		0.00	2.30	16.60	0.00	0.00					Dry, sunny, mild
			03/12/24 14:20		0.00	2.30	17.00	0.00	0.00					Dry, sunny, mild
			03/12/24 14:21		0.00	2.30	17.10	0.00	0.00					Dry, sunny, mild
			03/12/24 14:22		0.00	2.30	17.30	0.00	0.00					Dry, sunny, mild
			03/12/24 14:23		0.00	2.00	17.50	0.00	0.00					Dry, sunny, mild
			10/12/24 15:19	1024	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.42		Dry, sunny, cold
			10/12/24 15:20		0.00	3.30	17.90	0.00	0.00					Dry, sunny, cold
			10/12/24 15:21											Test stopped due to water
														ingress

Originator	Title:	Fig No:
JMcM	RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES	B103
Chk & App: CJH	Status: Final	Sheet 3 of 3

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APPENDIX C
GEOTECHNICAL LABORATORY TESTING

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 oedemeter 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 Drilling & Geotechnical Ltd t/a igne H
Whistleberry Road
Hamilton
ML6 OHP

For the attention of Ramsay Bell

Report No: A15413-1
Issue No: 01
Date of issue: 26/11/2024

LABORATORY TEST REPORT

Project Name	**CAMBUSHINNIE HAUL ROAD**		
Project Number	**A15413-1**	Date samples received	
Your Ref	26762	Date written instructions received	07/11/2024
Purchase Order	26762	Date testing commenced	11/11/2024

Please find enclosed the results as summarised below

Figure / Table	Test Quantity	Description	ISO 17025 Accredited
	54	Determination of Water Content	Yes
	11	Atterberg Limit	Yes
	37	Particle Size Distribution	Yes
	4	Moisture Content / Dry Density Relationship	Yes
	5	California Bearing Ratio	Yes
	4	Unconsolidated Undrained Single Stage Triaxial Compression	Yes
	2	Point Load Index	Yes

Remarks:
Interim results. Oedometer & Chemistry to follow

Key to symbols used in this report
S/C : Testing was sub-contracted

Issued by: C Donnelly
Laboratory Coordinator
CD
26/11/2024

Approved Signatories: C Donnelly - Laboratory Coordinator, C Loudon - Field Services Manager, S McDonagh - Laboratory Supervisor, S Gilchrist - Quality Supervisor, R Hobson - Field Services Manager, T Johnson - Senior Technician

Feedback on the this report may be left:
https://forms.office.com/pages/responsepage.aspx?id=CwCZTjwYeUGWZfDBJbk1g0fy8UwdJQhLttd3HBD1SytUMzNYWTdFVVpMWjdHREcwQUg1MDJLM09OTi4u&wdLOR

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

igne

Site CAMBUSHINNIE HAUL ROAD

Client Balfour Beatty

Engineer WSP

Contract No 26762

Sample Identification				Lab Sample ID	Non Enginering Description	Water Content %
Exploratory Hole	Depth m	Sample Ref	Sample Type			
BH01	0.80		B	2030056	Brown silty sandy fine to coarse GRAVEL with cobbles	13
BH01	1.20		B	2030057	Brown silty SAND and GRAVEL. Gravel is fine to coarse	16
BH01	11.70		UT	2030061	Brown gravelly very silty SAND. Gravel is fine to coarse	24.6
BH01	14.70		UT	2030062	Brown gravelly very silty SAND. Gravel is fine to coarse	22.8
BH01	5.70		UT	2030059	Brown gravelly very silty SAND. Gravel is fine to coarse	23.6
BH01	8.70		UT	2030060	Brown gravelly very silty SAND. Gravel is fine to coarse	22.6
BH02	0.80		B	2030065	Brown slightly silty sandy fine to coarse GRAVEL with cobbles	6.6
BH02	1.20		D	2030066	Brown silty very sandy fine to coarse GRAVEL with cobbles	7.3
BH02	7.20		D	2030067	Brown slightly sandy SILT	34
TP01	2.20		D	2030072	Brown slightly silty sandy fine to coarse GRAVEL	10.1
TP02	1.50		D	2030073	Brown silty sandy fine to coarse GRAVEL	9
TP03	1.50		D	2030076	Brown silty sandy fine to coarse GRAVEL	9.6
TP03	2.00		LB	2030075	Brown slightly silty sandy fine to coarse GRAVEL with cobbles	7.9
TP04	0.50		D	2030077	Brown gravelly very silty SAND. Gravel is fine to coarse	20.5

Notes

Originator	Checked & Approved
AM	CD 26/11/2024

Determination of the Water Content
BS EN ISO 17892-1:2014

Figure C1
Sheet 1 of 4

igne

Site CAMBUSHINNIE HAUL ROAD

Client Balfour Beatty

Engineer WSP

Contract No 26762

Sample Identification				Lab Sample ID	Non Enginering Description	Water Content %
Exploratory Hole	Depth m	Sample Ref	Sample Type			
TP04	2.50		D	2030078	Brown silty very sandy fine to coarse GRAVEL	9.8
TP05	2.60		D	2030081	Brown slightly silty sandy fine to coarse GRAVEL	8.8
TP06	1.50		D	2030083	Brown silty very gravelly SAND. Gravel is fine to coarse	17.5
TP07	2.50		D	2030084	Brown silty very sandy fine to coarse GRAVEL	12.2
TP08	1.20		D	2030086	Brown silty very sany fine to coarse GRAVEL	18.6
TP09	2.20		D	2030088	Brown slightly silty sandy fine to coarse GRAVEL	17.6
TP10	1.50		D	2030089	Brown silty sandy fine to coarse GRAVEL	14.3
TP12	1.20		D	2030092	Brown silty very gravelly SAND . Gravel is fine to coarse	10.9
TP12	2.20		D	2030093	Brown silty gravelly SAND . Gravel is fine to coarse	10.9
TP13	1.50		LB	2030095	Brown silty SAND and GRAVEL. Gravel is fine to coarse	15
TP13	2.50		LB	2030096	Brown silty SAND and GRAVEL with cobbles. Gravel is fine to coarse	13.3
TP14	0.50		LB	2030100	Brown silty very sandy fine to coarse GRAVEL. Gravel is fine to coarse	16
TP14	2.50		LB	2030101	Brown silty SAND and GRAVEL. Gravel is fine to coarse	15.9
TP15	0.50		D	2030103	Brown silty gravelly SAND . Gravel is fine to coarse	20.7

Notes

Originator	Checked & Approved
AM	CD 26/11/2024

Determination of the Water Content
BS EN ISO 17892-1:2014

Figure C2

62 Rochsolloch Road, Airdrie, ML6 9BG

igne

Site CAMBUSHINNIE HAUL ROAD

Client Balfour Beatty

Engineer WSP

Contract No 26762

Sample Identification				Lab Sample ID	Non Enginering Description	Water Content %
Exploratory Hole	Depth m	Sample Ref	Sample Type			
TP15	1.50		D	2030104	Brown silty gravelly SAND . Gravel is fine to coarse	20.6
TP16	1.00		LB	2030105	Brown silty gravelly SAND . Gravel is fine to coarse	21.8
TP17	0.50		D	2030108	Brown silty very sandy fine to coarse GRAVEL	18.1
TP18	2.50		D	2030110	Brown silty SAND and GRAVEL. Gravel is fine to coarse	17.8
TP19	1.50		D	2030113	Brown silty SAND and GRAVEL. Gravel is fine to coarse	11.3
TP20	1.20		D	2030115	Brown silty gravelly SAND . Gravel is fine to coarse	15.2
TP21	1.00		D	2030117	Brown silty gravelly SAND . Gravel is fine to coarse	18.2
TP21	3.00		D	2030118	Brown silty gravelly SAND . Gravel is fine to coarse	15.9
WS01	0.50		D	2030122	Brown gravelly silty SAND. Gravel is fine to coarse	21.1
WS01	1.00		D	2030123	Brown gravelly silty SAND. Gravel is fine to coarse	21
WS01	1.20		UL	2030120	Brown silty very sandy fine to coarse GRAVEL	13.8
WS01	2.00		D	2030124	Brown silty very sandy fine to coarse GRAVEL	10.2
WS01	4.20		D	2030125	Brown gravelly silty SAND. Gravel is fine to coarse	19.1
WS02	1.20		D	2030130	Brown silty SAND and GRAVEL. Gravel is fine to coarse	13.1

Notes

Originator	Checked & Approved
AM	CD 26/11/2024

Determination of the Water Content
BS EN ISO 17892-1:2014

Figure C3

62 Rochsolloch Road, Airdrie, ML6 9BG

igne	Site CAMBUSHINNIE HAUL ROAD	Contract No 26762
	Client Balfour Beatty	
	Engineer WSP	

Sample Identification				Lab Sample ID	Non Enginering Description	Water Content %
Exploratory Hole	Depth m	Sample Ref	Sample Type			
WS03	0.50		D	2030137	Brown gravelly silty SAND. Gravel is fine to medium	32.9
WS03	2.20		B	2030136	Brown slightly gravelly silty SAND. Gravel is fine to medium	18
WS04	0.80		B	2030141	Brown silty very gravelly SAND. Gravel is fine to coarse	20.3
WS04	2.20		D	2030140	Brown silty very sandy fine to coarse GRAVEL	8.7
WS05	0.40		D	2030143	Brown very silty SAND	32.3
WS05	2.20		D	2030145	Brown silty SAND and GRAVEL. Gravel is fine to coarse	10.6
WS05	2.20		UL	2030147	Brown silty SAND and GRAVEL. Gravel is fine to coarse	9.6
WS05	2.80		D	2030146	Brown silty very sandy fine to coarse GRAVEL	18.2
WS06	2.20		D	2030149	Brown silty very sandy fine to coarse GRAVEL	10.8
WS06	3.00		D	2030150	Brown silty SAND and GRAVEL. Gravel is fine to coarse	13
WS07	1.20		D	2030153	Brown silty SAND and GRAVEL. Gravel is fine to coarse	17.3
WS07	1.20		UL	2030155	Brown silty very sandy fine to coarse GRAVEL	16.6

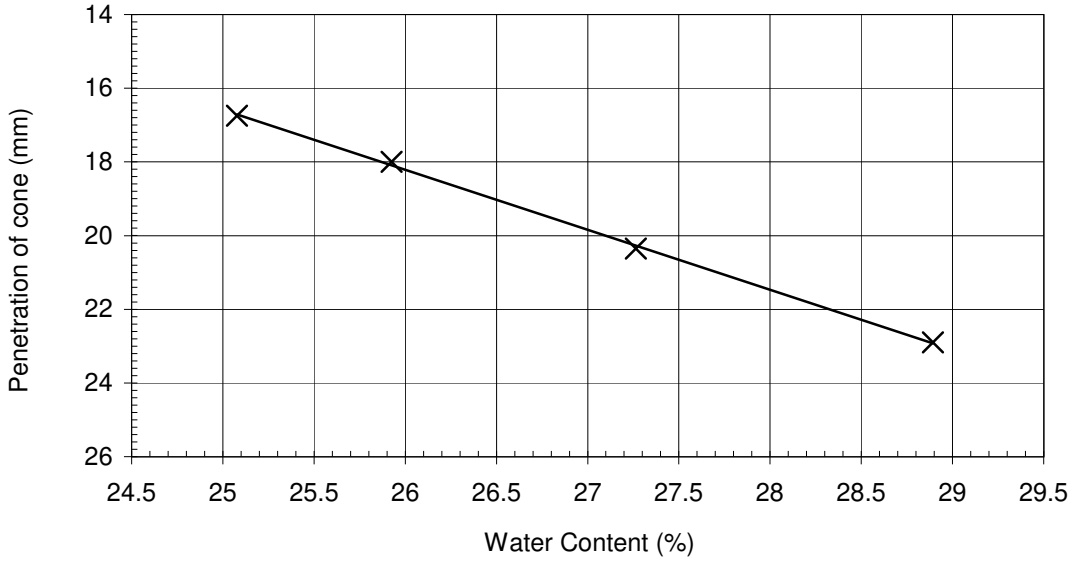
Notes

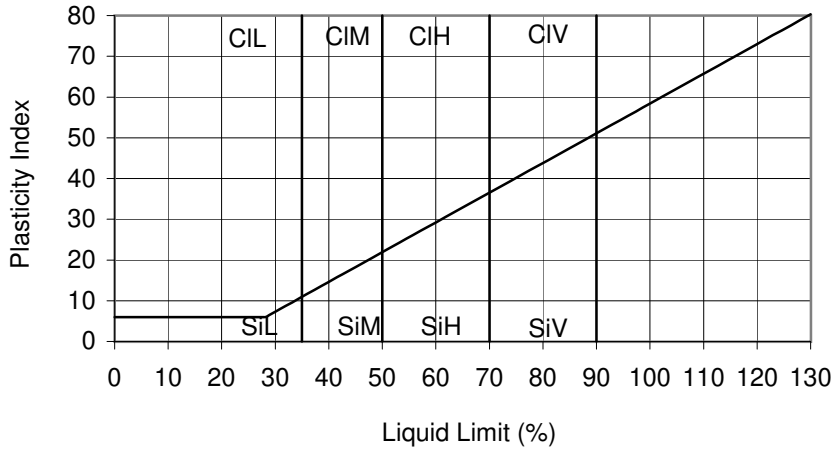
Originator	Checked & Approved	Determination of the Water Content	Figure C4
AM	CD 26/11/2024	BS EN ISO 17892-1:2014	Sheet 4 of 4

igne	Site	CAMBUSHINNIE HAUL ROAD	**Contract No. 26762**
	Client	Balfour Beatty	Hole ID BH01
	Engineer	WSP	Sample Ref Depth (m) 5.70 Sample Type UT

Non Engineering Description : Brown gravelly very silty SAND. 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 :

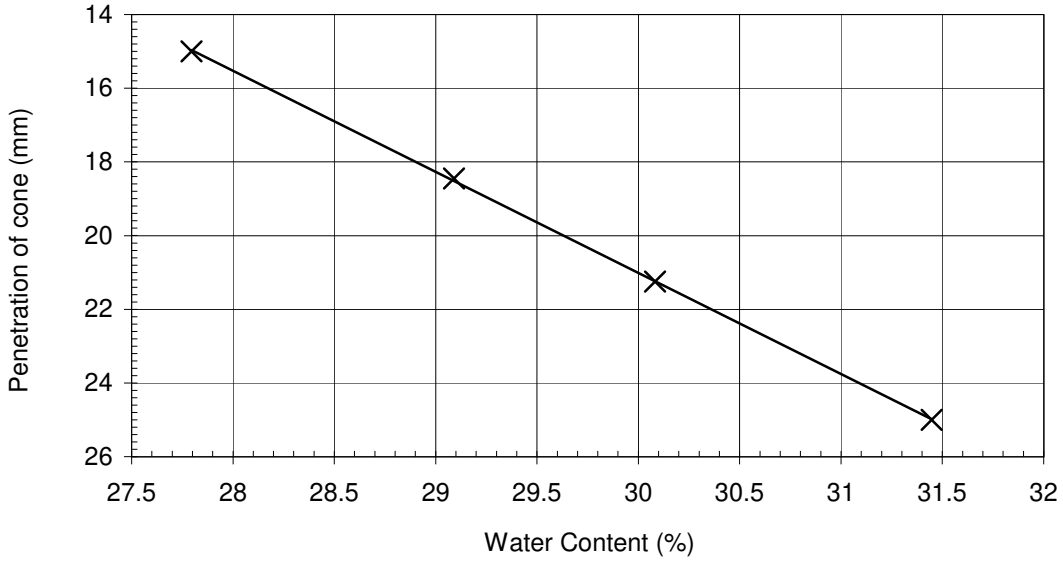
As Received Water Content : (BS EN ISO 17892-1:2014)	23.6	%
Percentage retained on 425µm sieve :	23	%
Liquid Limit :	27	%
Plastic Limit :	Non-Plastic	%
Equivalent water content of material passing 425µm sieve :	30.6	%

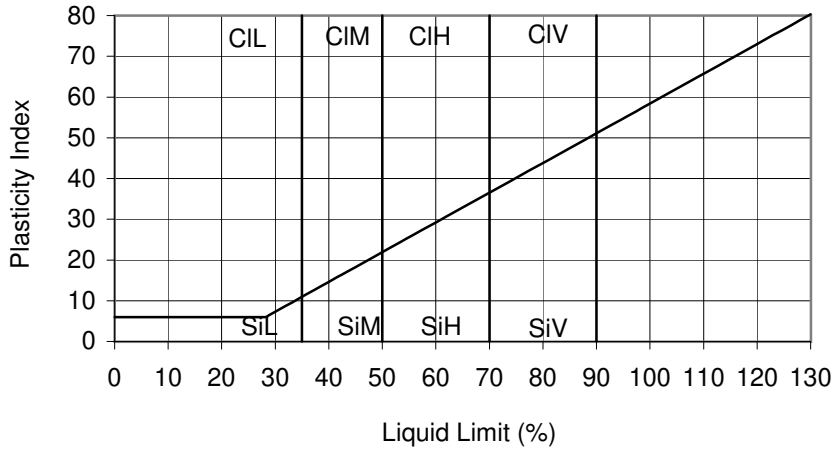
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	Figure C5 Sheet 1 of 1
CM	CD 26/11/2024		

igne	Site	CAMBUSHINNIE HAUL ROAD	**Contract No. 26762**
	Client	Balfour Beatty	Hole ID BH01
	Engineer	WSP	Sample Ref Depth (m) 8.70 Sample Type UT

Non Engineering Description : Brown gravelly very silty SAND. 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 :

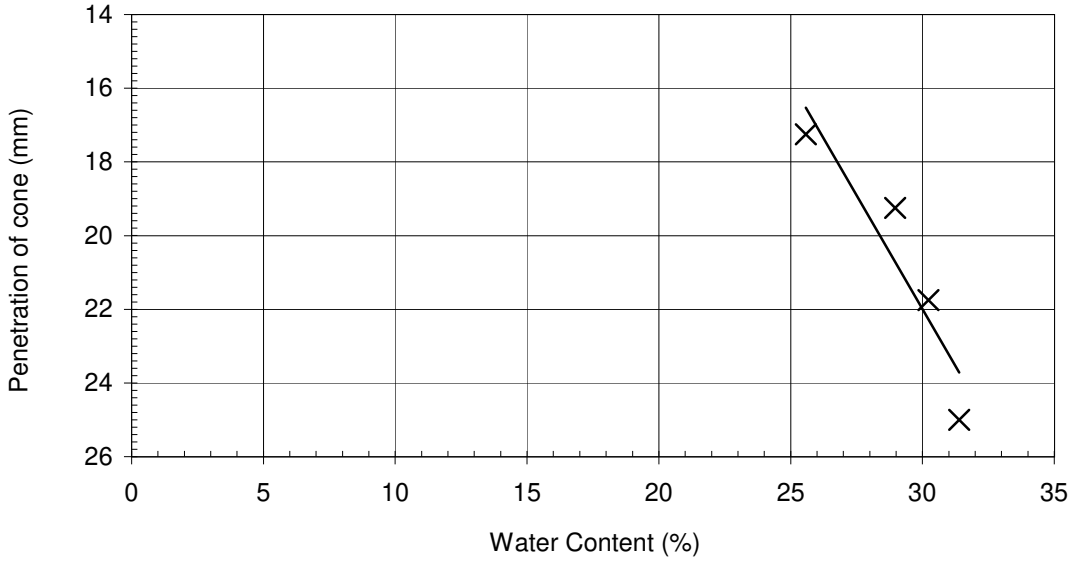
As Received Water Content : (BS EN ISO 17892-1:2014)	22.6	%
Percentage retained on 425µm sieve :	9	%
Liquid Limit :	30	%
Plastic Limit :	Non-Plastic	%
Equivalent water content of material passing 425µm sieve :	24.8	%

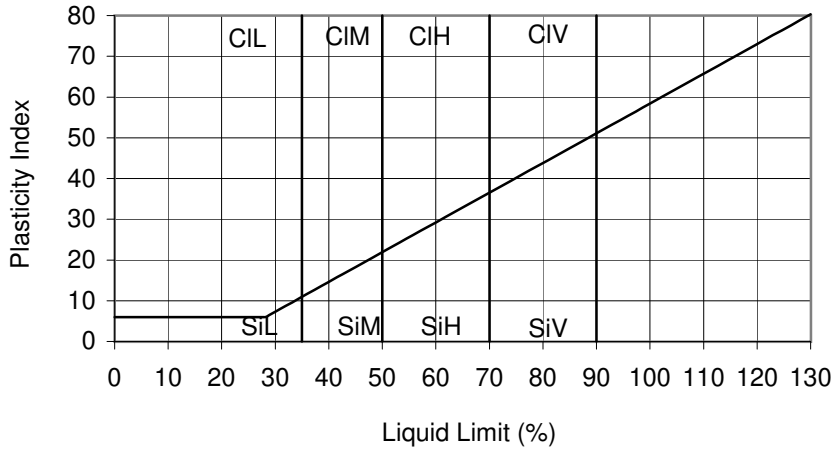
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	Figure C6
CM	CD 26/11/2024		Sheet 1 of 1

igne	Site	CAMBUSHINNIE HAUL ROAD	**Contract No. 26762**
	Client	Balfour Beatty	Hole ID BH01
	Engineer	WSP	Sample Ref Depth (m) 11.70 Sample Type UT

Non Engineering Description : Brown gravelly very silty SAND. 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 :

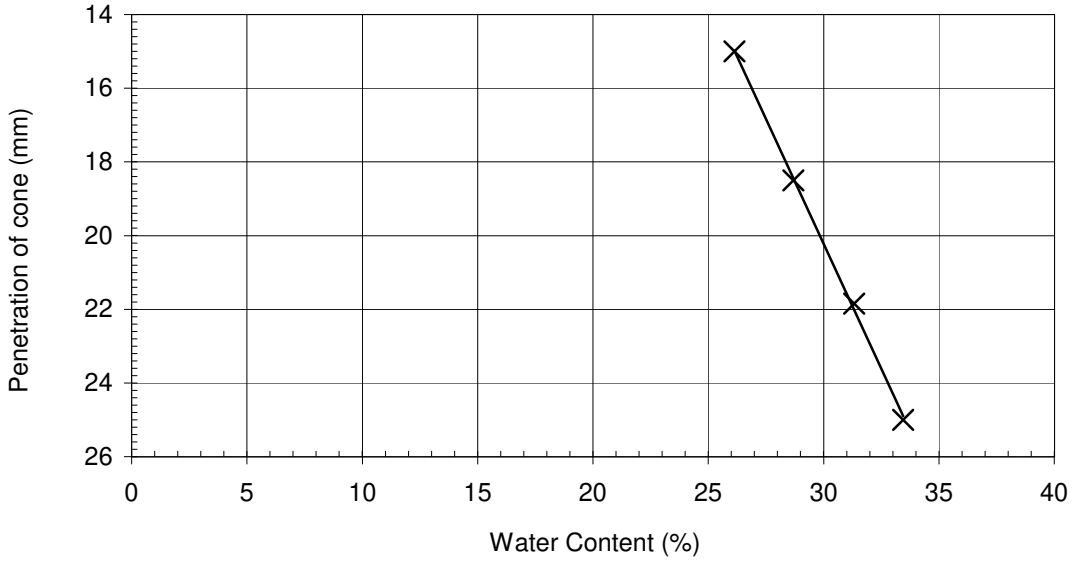
As Received Water Content : (BS EN ISO 17892-1:2014)	24.6	%
Percentage retained on 425µm sieve :	9	%
Liquid Limit :	28	%
Plastic Limit :	Non-Plastic	%
Equivalent water content of material passing 425µm sieve :	27.0	%

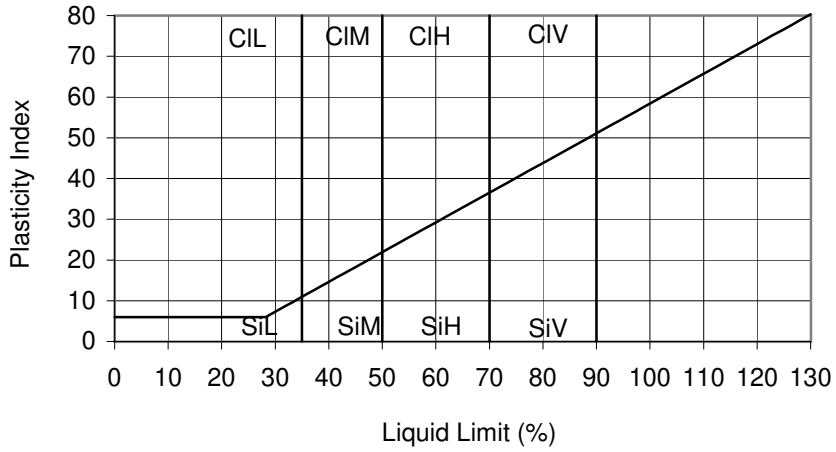
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	Figure C7 Sheet 1 of 1
CM	CD 26/11/2024		

igne	Site	CAMBUSHINNIE HAUL ROAD	**Contract No. 26762**
	Client	Balfour Beatty	Hole ID BH01
	Engineer	WSP	Sample Ref Depth (m) 14.70 Sample Type UT

Non Engineering Description : Brown gravelly very silty SAND. 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 :

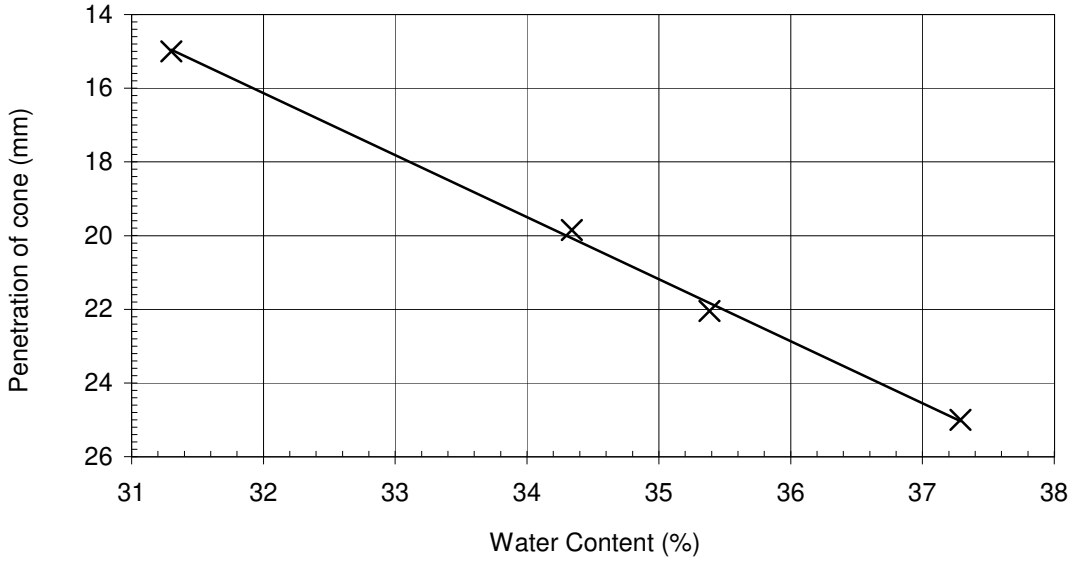
As Received Water Content : (BS EN ISO 17892-1:2014)	22.8	%
Percentage retained on 425µm sieve :	12	%
Liquid Limit :	30	%
Plastic Limit :	Non-Plastic	%
Equivalent water content of material passing 425µm sieve :	25.9	%

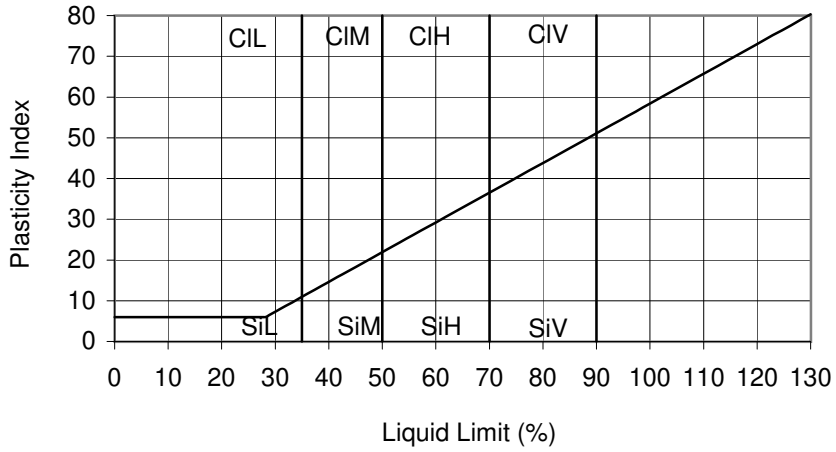
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	Figure C8 Sheet 1 of 1
CM	CD 26/11/2024		

igne	Site	CAMBUSHINNIE HAUL ROAD	**Contract No. 26762**
	Client	Balfour Beatty	Hole ID BH02
	Engineer	WSP	Sample Ref Depth (m) 7.20 Sample Type D

Non Engineering Description : Brown slightly sandy SILT

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 :

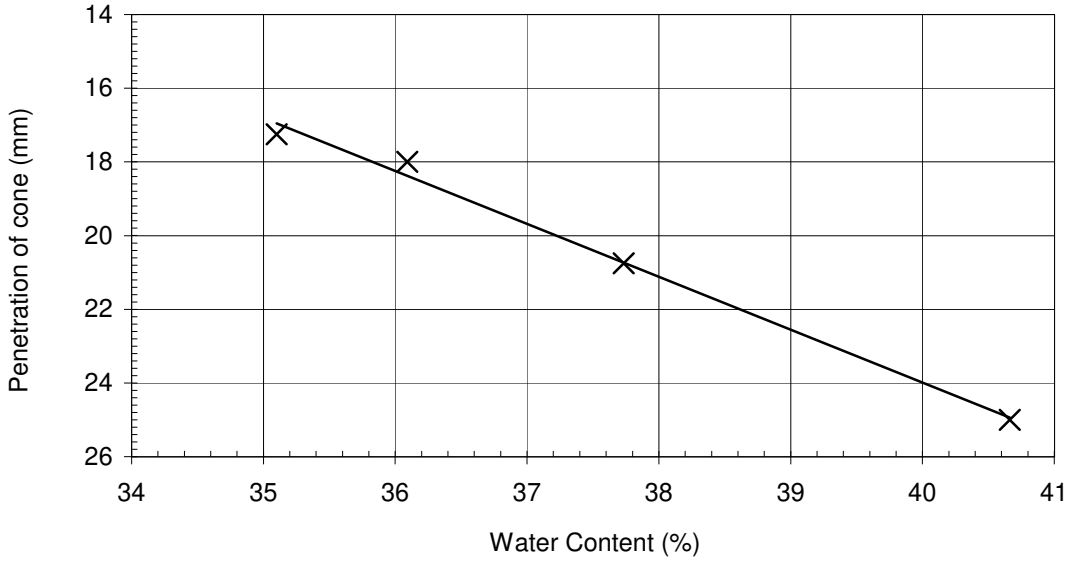
As Received Water Content : (BS EN ISO 17892-1:2014)	34.0	%
Percentage retained on 425µm sieve :	6	%
Liquid Limit :	34	%
Plastic Limit :	Non-Plastic	%
Equivalent water content of material passing 425µm sieve :	36.2	%

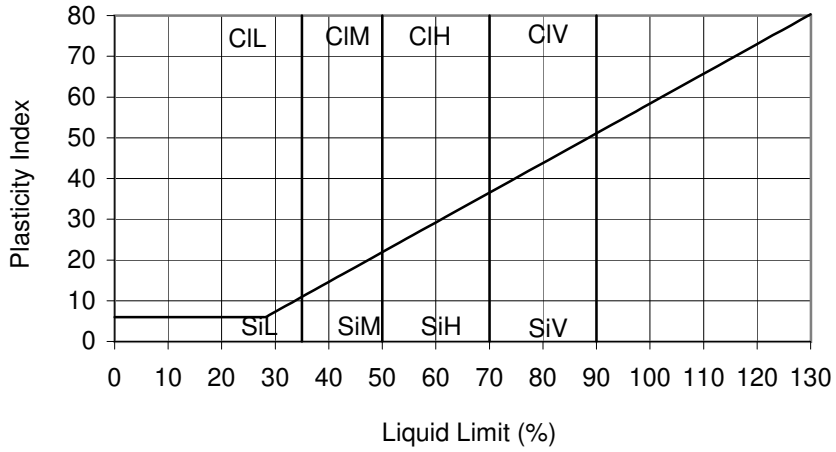
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	Figure C9 Sheet 1 of 1
CM	CD 26/11/2024		

igne	Site	CAMBUSHINNIE HAUL ROAD	**Contract No. 26762**
	Client	Balfour Beatty	Hole ID WS03
	Engineer	WSP	Sample Ref Depth (m) 0.50 Sample Type D

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

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 :

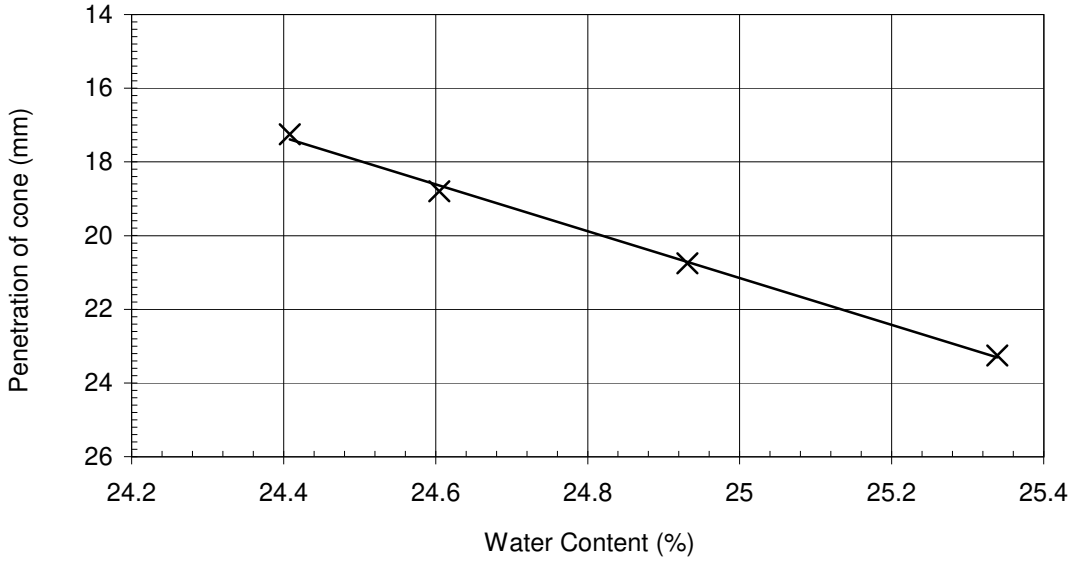
As Received Water Content : (BS EN ISO 17892-1:2014)	32.9	%
Percentage retained on 425µm sieve :	26	%
Liquid Limit :	37	%
Plastic Limit :	Non-Plastic	%
Equivalent water content of material passing 425µm sieve :	44.5	%

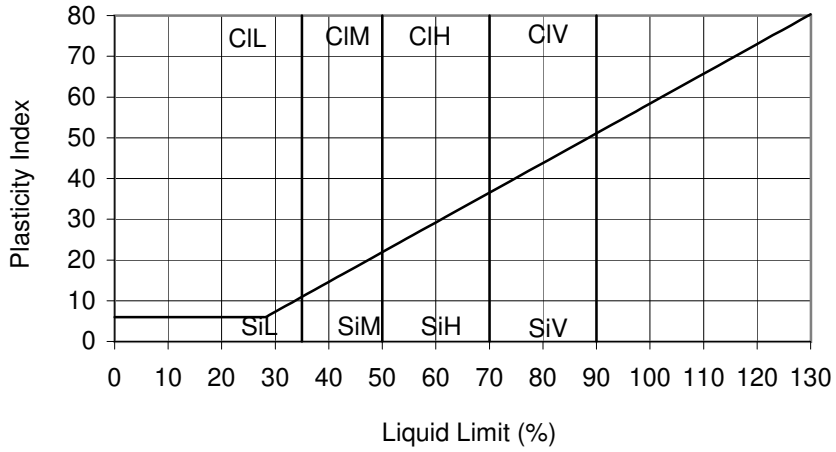
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	Figure C10 Sheet 1 of 1
CM	CD 26/11/2024		

igne	Site	CAMBUSHINNIE HAUL ROAD	**Contract No. 26762**
	Client	Balfour Beatty	Hole ID WS05
	Engineer	WSP	Sample Ref Depth (m) 2.20 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 :

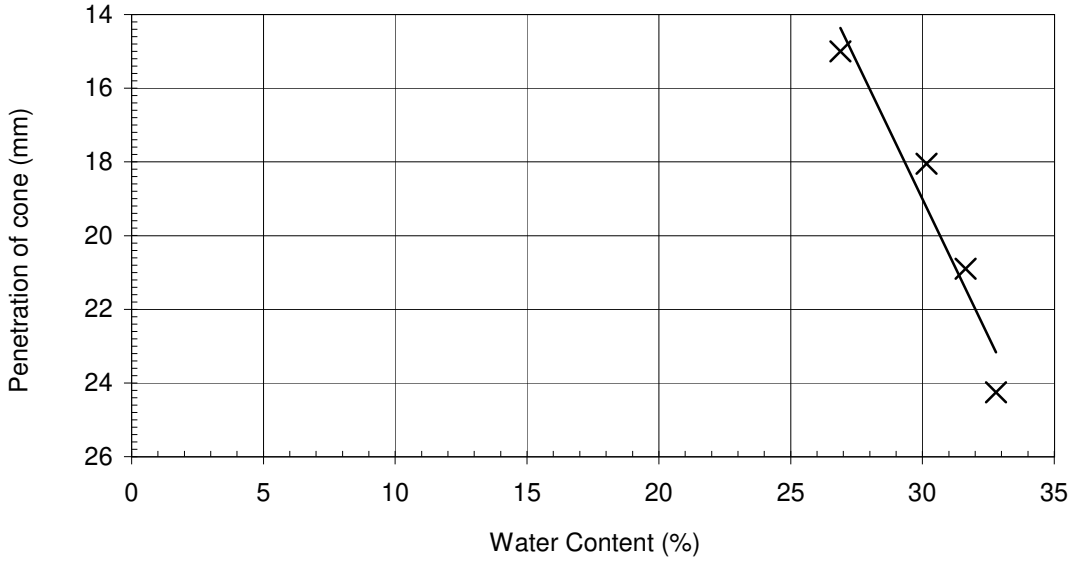
As Received Water Content : (BS EN ISO 17892-1:2014)	10.6	%
Percentage retained on 425µm sieve :	52	%
Liquid Limit :	25	%
Plastic Limit :	Non-Plastic	%
Equivalent water content of material passing 425µm sieve :	22.1	%

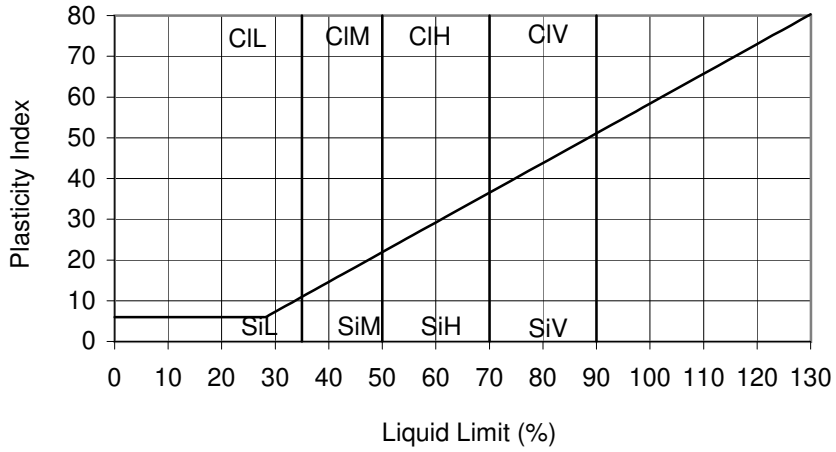
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	Figure C11 Sheet 1 of 1
CM	CD 26/11/2024		

igne	Site	CAMBUSHINNIE HAUL ROAD	**Contract No. 26762**
	Client	Balfour Beatty	Hole ID WS05
	Engineer	WSP	Sample Ref Depth (m) 2.80 Sample Type D

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

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 :

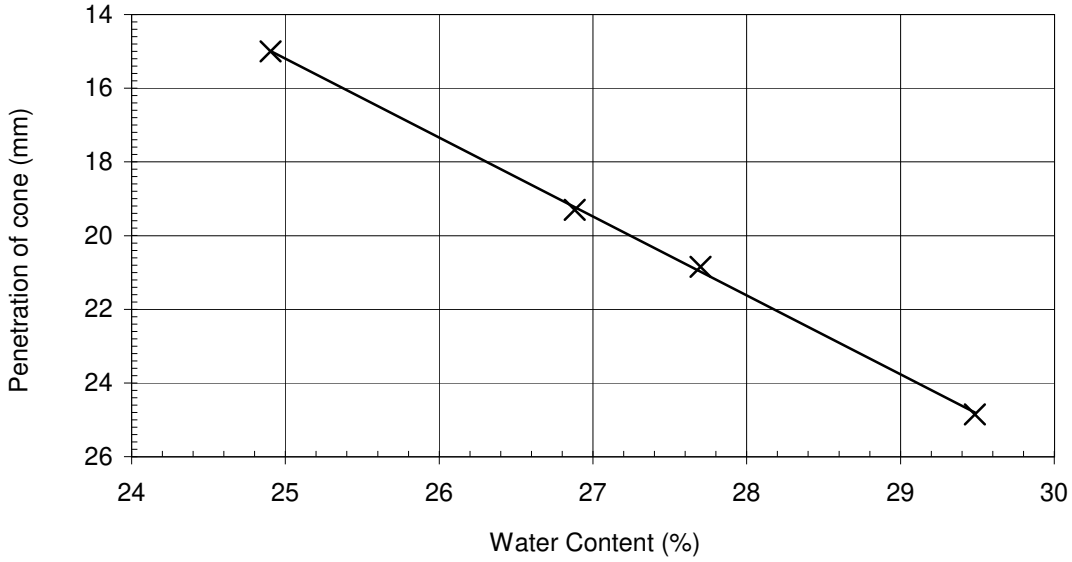
As Received Water Content : (BS EN ISO 17892-1:2014)	18.2	%
Percentage retained on 425µm sieve :	71	%
Liquid Limit :	31	%
Plastic Limit :	Non-Plastic	%
Equivalent water content of material passing 425µm sieve :	62.8	%

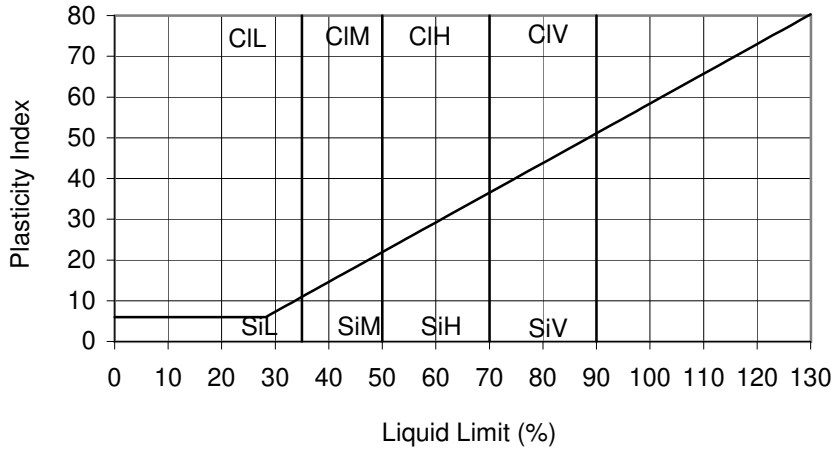
Originator	Checked & Approved	**Liquid Limit (Four Point Cone Penetrometer Method)** **Plastic Limit, Plasticity Index & Liquidity Index** BS EN ISO 17892-12:2018 Clause 5.3 BS EN ISO 17892-12:2018 Clause 5.5	Figure C12 Sheet 1 of 1
CM	CD 26/11/2024		

igne	Site	CAMBUSHINNIE HAUL ROAD	**Contract No. 26762**
	Client	Balfour Beatty	Hole ID WS06
	Engineer	WSP	Sample Ref Depth (m) 2.20 Sample Type D

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

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)	10.8	%
Percentage retained on 425µm sieve :	61	%
Liquid Limit :	27	%
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	Figure C13 Sheet 1 of 1
CM	CD 26/11/2024		