

Information in Support of the Analytical Results

Our Ref 21-17664

Client Ref 4339

Contract Preliminary Onshore Ground Investigation for NZT

Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report



Certificate of Analysis

Certificate Number 21-18739

Issued: 09-Sep-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-18739

Client Reference 4339

Order No LA 2548

Contract Title Preliminary Onshore Ground Investigation for NZT

Description 29 Soil samples.

Date Received 03-Sep-21

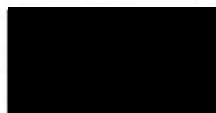
Date Started 03-Sep-21

Date Completed 09-Sep-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager





Summary of Chemical Analysis

Soil Samples

Our Ref 21-18739

Client Ref 4339

Contract Title Preliminary Onshore Ground Investigation for NZT

Lab No	1899269	1899270	1899271	1899272	1899273	1899274	1899275	1899276	1899277	1899278	1899279
Sample ID	MS\BH04	LF\TP01	LF\TP03	MS\BH09	MS\BH09	MS\BH09	MS\BH09	MS\BH10	MS\BH10	MS\BH10	MS\BH10
Depth	1.20	1.90	3.95	1.50	13.50	14.00	16.90	7.20	11.30	12.60	13.60
Other ID	8	10	18	7	47	50	58	18	28	31	33
Sample Type	B	J	J	J	J	J	J	J	J	J	J
Sampling Date	21/06/2021	23/06/2021	24/06/2021	05/07/2021	05/07/2021	05/07/2021	08/07/2021	15/06/2021	15/06/2021	16/06/2021	16/06/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test Method LOD Units

Inorganics											
Loss on Ignition at 440oC	DETSC 2003#	0.01	%				6.1	3.6	5.8		
pH	DETSC 2008#		pH		10.7		10.5				7.9
Organic matter	DETSC 2002#	0.1	%					2.1	2.8		
Chloride Aqueous Extract	DETSC 2055	1	mg/l		3.6		26				1600
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		1900		1300				640
Sulphur as S, Total	DETSC 2320	0.01	%		0.70		0.30				0.40
Sulphate as SO4, Total	DETSC 2321#	0.01	%		1.7		0.66				0.19



Summary of Chemical Analysis

Soil Samples

Our Ref 21-18739

Client Ref 4339

Contract Title Preliminary Onshore Ground Investigation for NZT

Lab No	1899280	1899281	1899282	1899283	1899284	1899285	1899286	1899287	1899288	1899289	1899290
Sample ID	MS\BH10	MS\BH10	MS\TP01	MS\TP01	MS\TP03	MS\TP04	MS\TP05	MS\TP05	MS\TP05	MS\TP06	MS\TP07
Depth	14.10	15.60	2.20	4.20	2.20	2.70	0.70	2.70	4.20	3.20	1.70
Other ID	35	39	12	21	12	14	5	14	21	10	9
Sample Type	J	J	J	J	J	J	J	J	J	J	J
Sampling Date	16/06/2021	16/06/2021	16/06/2021	16/06/2021	14/06/2021	15/06/2021	17/06/2021	17/06/2021	17/06/2021	22/06/2021	17/06/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test Method LOD Units

Inorganics											
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	15							
pH	DETSC 2008#		pH		8.3	11.3		9.0	11.2		11.5
Organic matter	DETSC 2002#	0.1	%	5.2							
Chloride Aqueous Extract	DETSC 2055	1	mg/l		690	310		100	160		33
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		400	720		870	870		460
Sulphur as S, Total	DETSC 2320	0.01	%		0.10	0.47		0.15	0.82		0.22
Sulphate as SO4, Total	DETSC 2321#	0.01	%		0.11	0.77		0.27	1.0		0.52



Summary of Chemical Analysis

Soil Samples

Our Ref 21-18739

Client Ref 4339

Contract Title Preliminary Onshore Ground Investigation for NZT

Lab No	1899291	1899292	1899293	1899294	1899295	1899296	1899297
Sample ID	MS\TP07	MS\TP09	MS\TP09	MS\BH05	MS\BH03	LF\BH02	MS\BH17
Depth	2.20	1.20	4.20	18.30	1.50	27.00	6.20
Other ID	12	8	21	3	10	76	26
Sample Type	J	J	J	J	J	J	B
Sampling Date	17/06/2021	16/06/2021	16/06/2021	21/06/2021	23/06/2021	08/07/2021	07/07/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units
Inorganics			
Loss on Ignition at 440oC	DETSC 2003#	0.01	%
pH	DETSC 2008#		pH
Organic matter	DETSC 2002#	0.1	%
Chloride Aqueous Extract	DETSC 2055	1	mg/l
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l
Sulphur as S, Total	DETSC 2320	0.01	%
Sulphate as SO4, Total	DETSC 2321#	0.01	%

Information in Support of the Analytical Results

Our Ref 21-18739

Client Ref 4339

Contract Preliminary Onshore Ground Investigation for NZT

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1899269	MS\BH04 1.20 SOIL	21/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899270	LF\TP01 1.90 SOIL	23/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899271	LF\TP03 3.95 SOIL	24/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899272	MS\BH09 1.50 SOIL	05/07/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899273	MS\BH09 13.50 SOIL	05/07/21	PT 1L	Organic Matter (Manual) (28 days)	
1899274	MS\BH09 14.00 SOIL	05/07/21	PT 1L	Organic Matter (Manual) (28 days)	
1899275	MS\BH09 16.90 SOIL	08/07/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899276	MS\BH10 7.20 SOIL	15/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899277	MS\BH10 11.30 SOIL	15/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899278	MS\BH10 12.60 SOIL	16/06/21	PT 1L	Organic Matter (Manual) (28 days)	
1899279	MS\BH10 13.60 SOIL	16/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899280	MS\BH10 14.10 SOIL	16/06/21	PT 1L	Organic Matter (Manual) (28 days)	
1899281	MS\BH10 15.60 SOIL	16/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899282	MS\TP01 2.20 SOIL	16/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899283	MS\TP01 4.20 SOIL	16/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899284	MS\TP03 2.20 SOIL	14/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899285	MS\TP04 2.70 SOIL	15/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899286	MS\TP05 0.70 SOIL	17/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899287	MS\TP05 2.70 SOIL	17/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899288	MS\TP05 4.20 SOIL	17/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	

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Contract Preliminary Onshore Ground Investigation for NZT

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1899289	MS\TP06 3.20 SOIL	22/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899290	MS\TP07 1.70 SOIL	17/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899291	MS\TP07 2.20 SOIL	17/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899292	MS\TP09 1.20 SOIL	16/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899293	MS\TP09 4.20 SOIL	16/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899294	MS\BH05 18.30 SOIL	21/06/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899295	MS\BH03 1.50 SOIL	23/06/21	PT 1L	Organic Matter (Manual) (28 days)	
1899296	LF\BH02 27.00 SOIL	08/07/21	PT 1L	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1899297	MS\BH17 6.20 SOIL	07/07/21	PT 1L	Organic Matter (Manual) (28 days)	

Key: P-Plastic T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

End of Report

Determination of Dry Density/Moisture Content Relationship



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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- LF\BH01

Depth (m) :- 3.40

Sample Type & No :- B14

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 14

Particle Density (Assumed) = 2.50

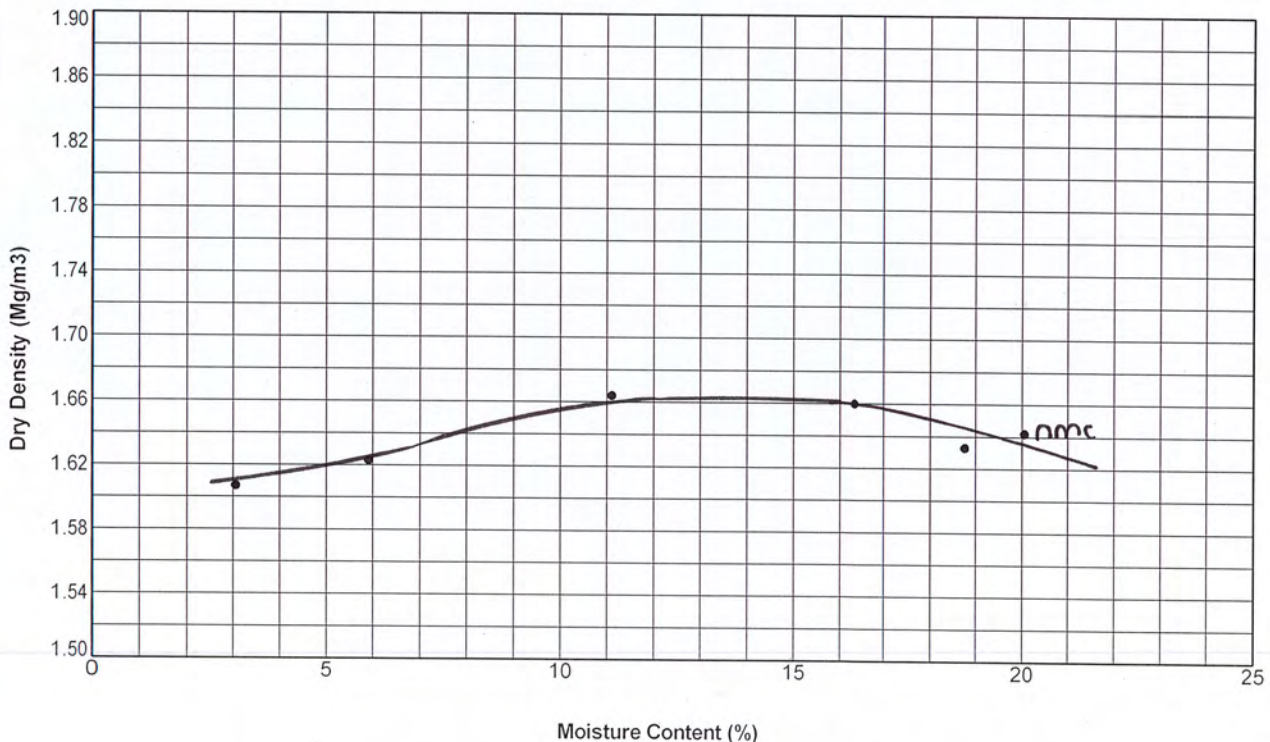
Maximum Dry Density (Mg/m³) = 1.66

Retained on 20mm Sieve (%) = 7.0

Date Tested = 26/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

[Redacted Signature]

Name :-

M. SELKIRK

Date of issue :-

03/09/2021

Certificate No :-

COMP/4339/1

AEG Contract No. :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- LF\BH01

Depth (m) :- 3.65

Sample Type & No :- B16

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 18

Particle Density (Measured) = 2.64

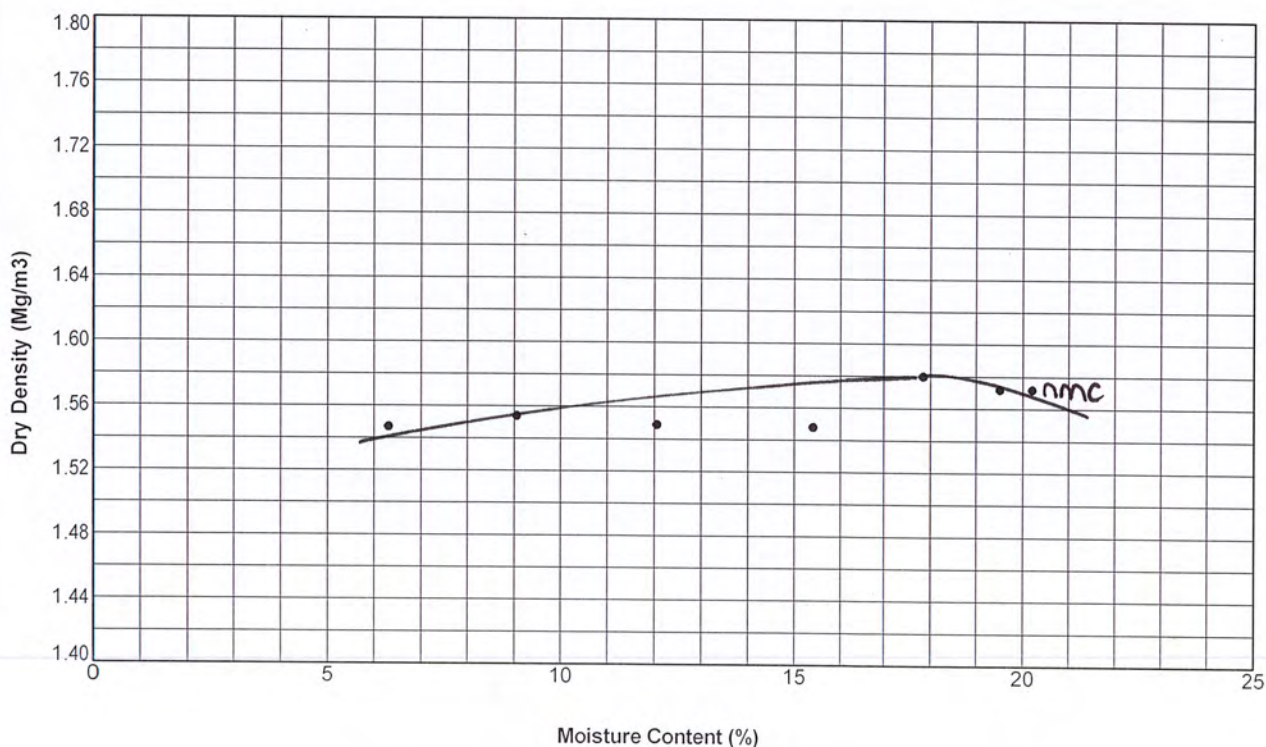
Maximum Dry Density (Mg/m³) = 1.58

Retained on 20mm Sieve (%) = 0.0

Date Tested = 04/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

[Redacted Signature]

Name :-

M. SELKIRK

Date of issue :-

31/08/2021

Certificate No :-

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AEG Contract No. :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- LF\BH02

Depth (m) :- 1.20

Sample Type & No :- B7

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 17

Particle Density (Assumed) = 2.30

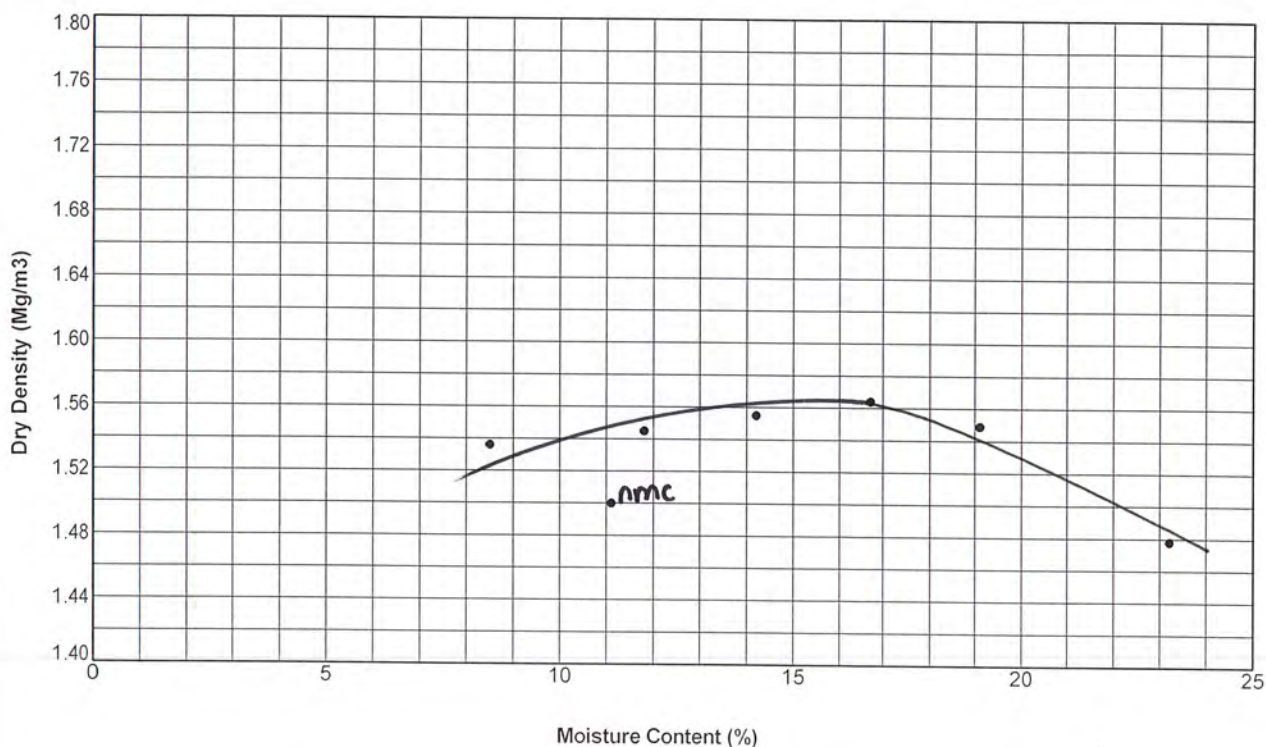
Maximum Dry Density (Mg/m³) = 1.56

Retained on 20mm Sieve (%) = 0.0

Date Tested = 29/07/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue

31/08/2021

Name :-

M. SELKIRK

Certificate No :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- LF1BH02

Depth (m) :- 4.20

Sample Type & No :- B14

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 19

Particle Density (Measured) = 2.61

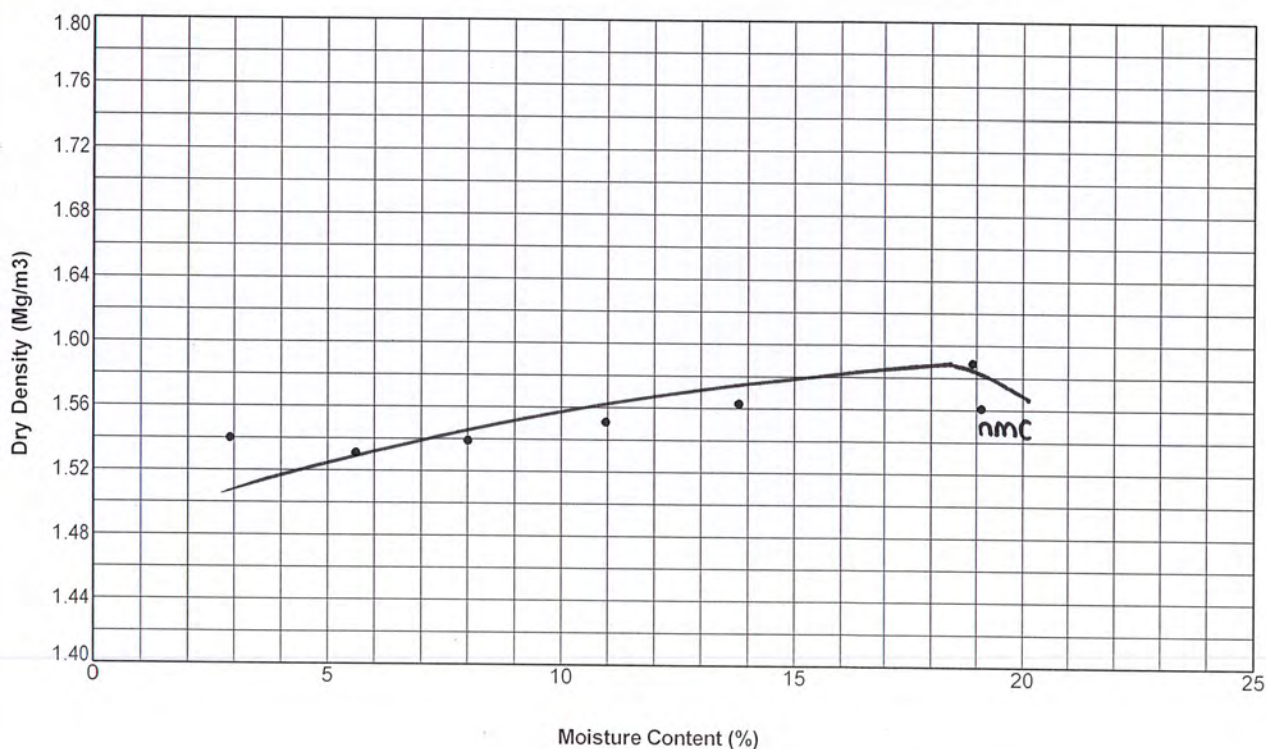
Maximum Dry Density (Mg/m³) = 1.59

Retained on 20mm Sieve (%) = 0.0

Date Tested = 04/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue :-

31/08/2021

Name :-

M. SELKIRK

Certificate No :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- LFITP02

Depth (m) :- 2.80

Sample Type & No :- B9

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 11

Particle Density (Assumed) = 2.10

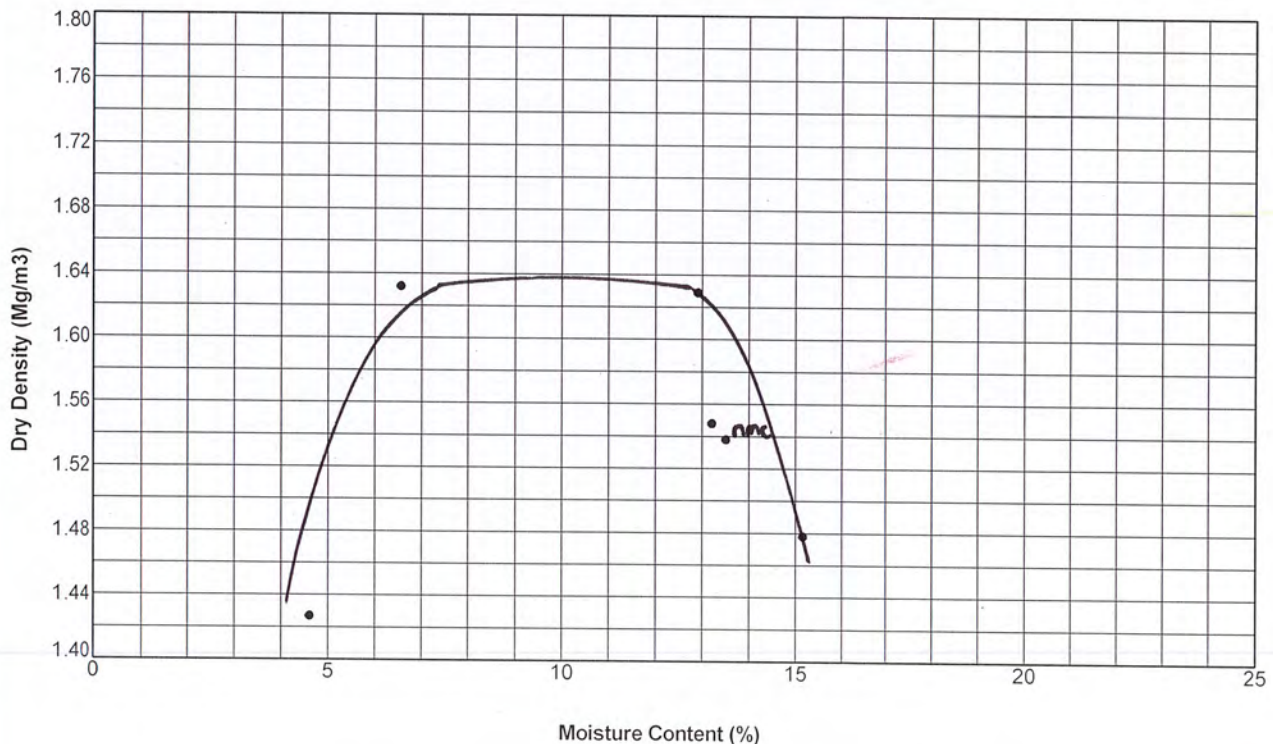
Maximum Dry Density (Mg/m³) = 1.63

Retained on 20mm Sieve (%) = 34.9

Date Tested = 13/08/2021

Retained on 37.5mm Sieve (%) = 10.6

Remarks : Test deviated from the standard due to excessive coarse material



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-



Name :-

M. SELKIRK

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Date of issue :-

02/09/2021

Certificate No :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH02

Depth (m) :- 2.70

Sample Type & No :- B14

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 18

Particle Density (Assumed) = 2.65

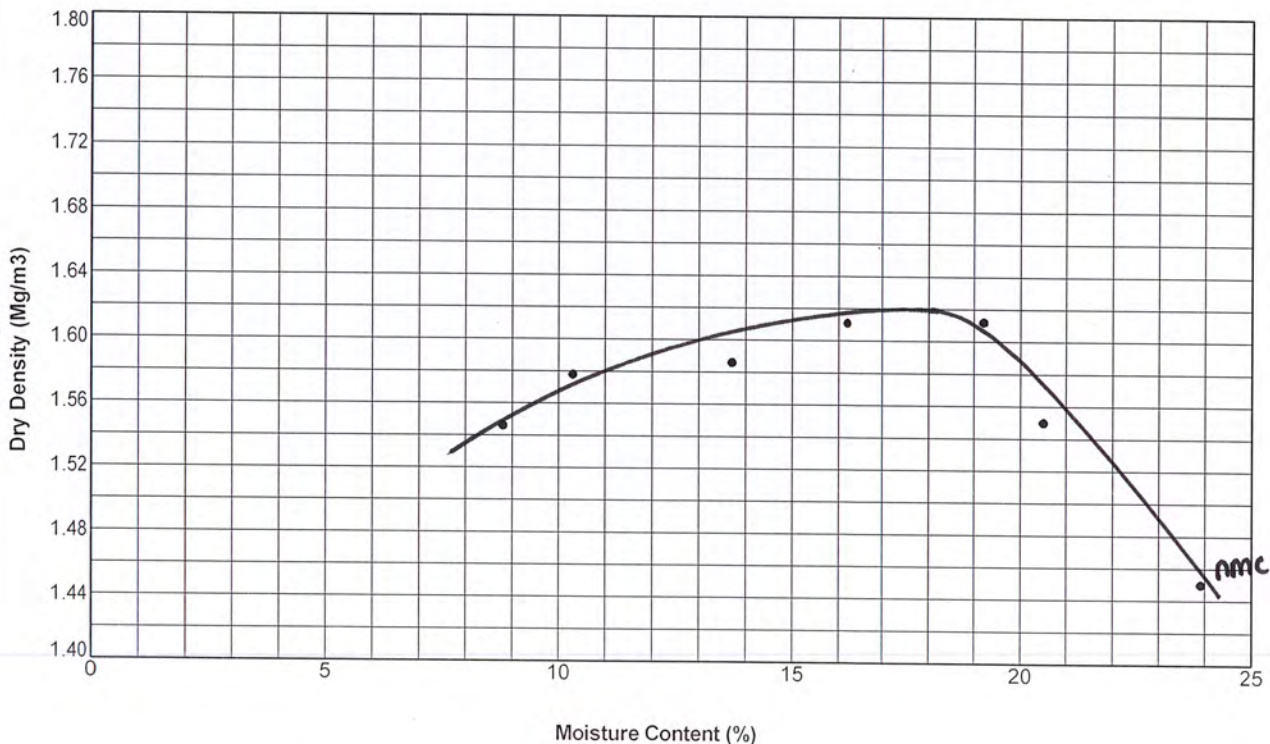
Maximum Dry Density (Mg/m³) = 1.62

Retained on 20mm Sieve (%) = 0.0

Date Tested = 29/07/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

[Redacted Signature]

Name :-

M. SELKIRK

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MSIBH02

Depth (m) :- 3.40

Sample Type & No :- B16

Test Method

Vibro Hammer Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 15

Particle Density (Measured) = 2.63

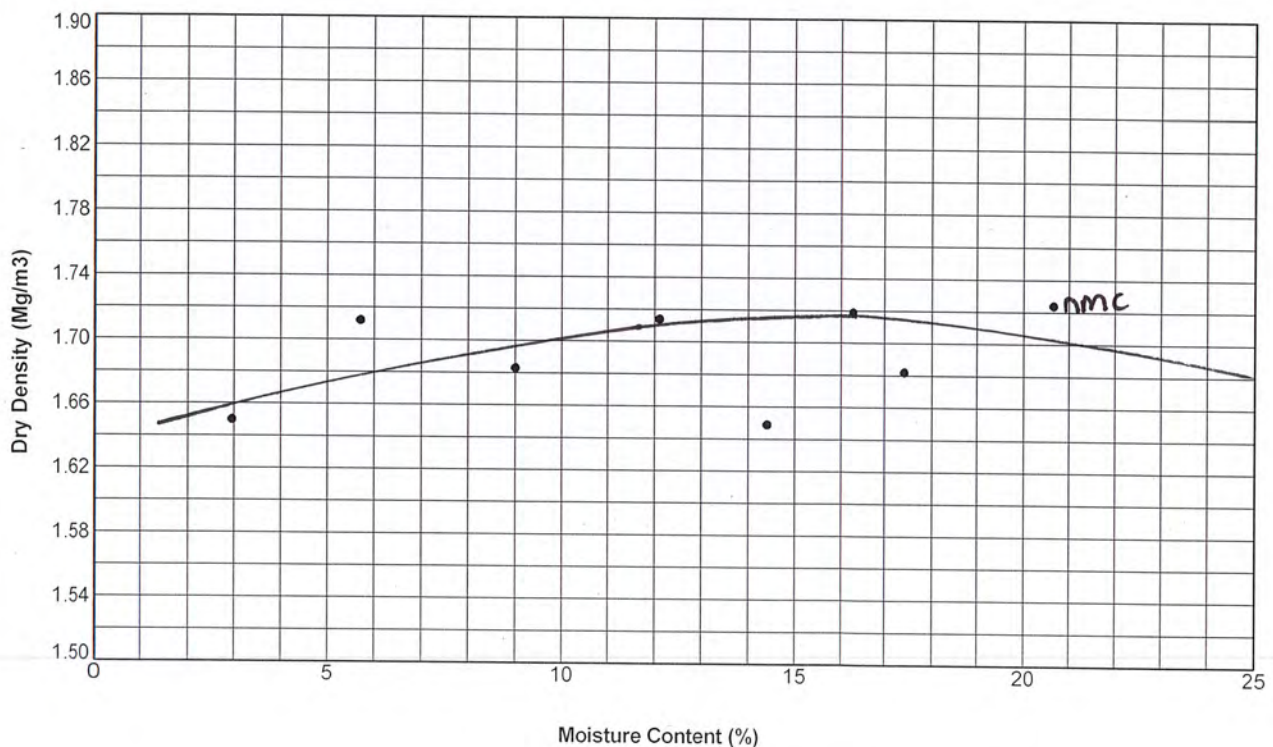
Maximum Dry Density (Mg/m³) = 1.72

Retained on 20mm Sieve (%) = 0.0

Date Tested = 04/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

[Redacted Signature]

Name :-

M. SELKIRK

Date of issue :-

09/09/2021

Certificate No :-

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AEG Contract No. :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH02

Depth (m) :- 3.40

Sample Type & No :- B16

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 15

Particle Density (Measured) = 2.63

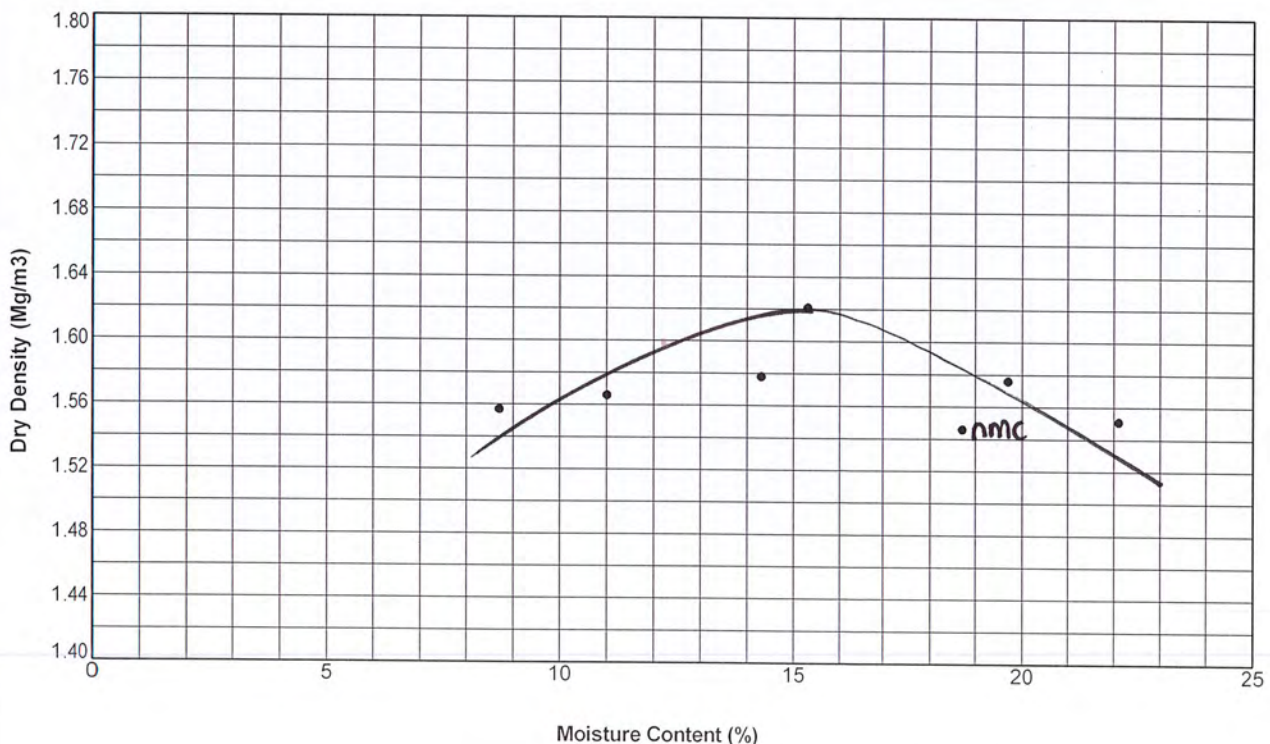
Maximum Dry Density (Mg/m³) = 1.62

Retained on 20mm Sieve (%) = 0.0

Date Tested = 04/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

[Redacted Signature]

Name :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH03

Depth (m) :- 2.80

Sample Type & No :- B16

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 11

Particle Density (Assumed) = 2.45

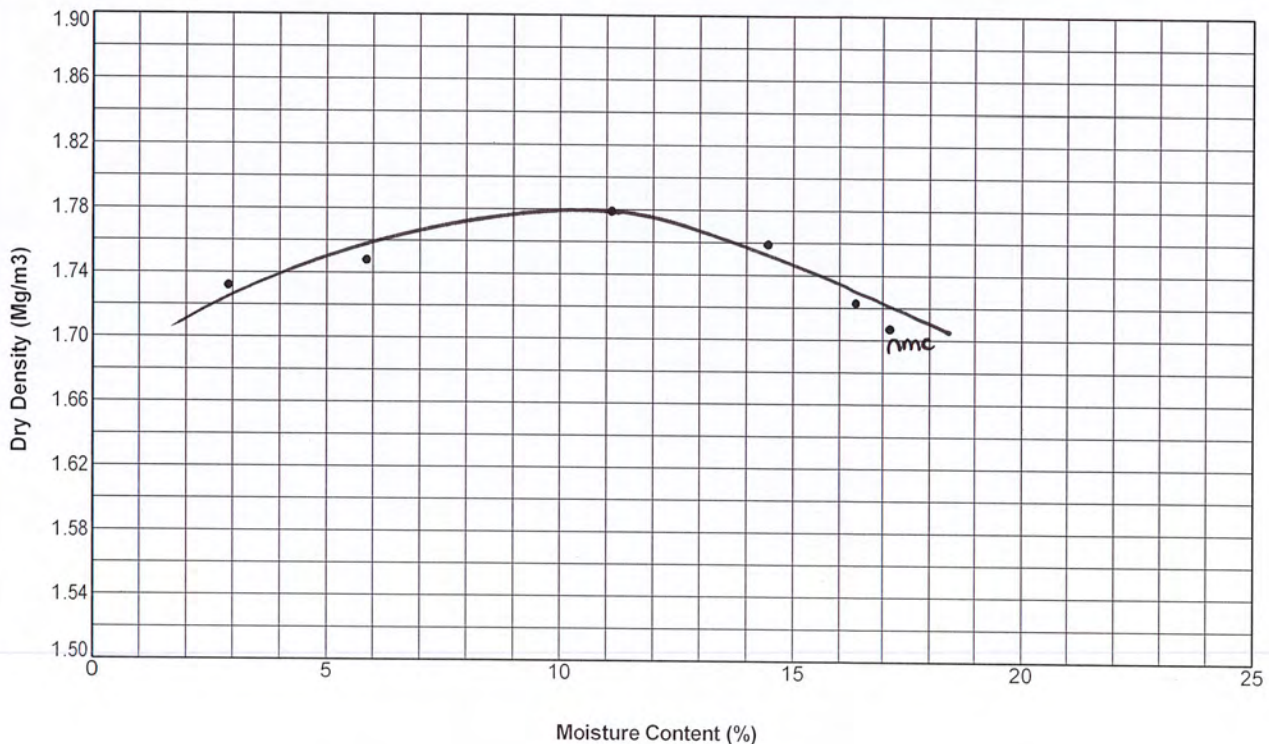
Maximum Dry Density (Mg/m³) = 1.78

Retained on 20mm Sieve (%) = 2.0

Date Tested = 04/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue :-

31/08/2021

Name :-

M. SELKIRK

Certificate No :-

COMP/4339/1

AEG Contract No. :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH04

Depth (m) :- 2.70

Sample Type & No :- B12

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 18

Particle Density (Measured) = 2.64

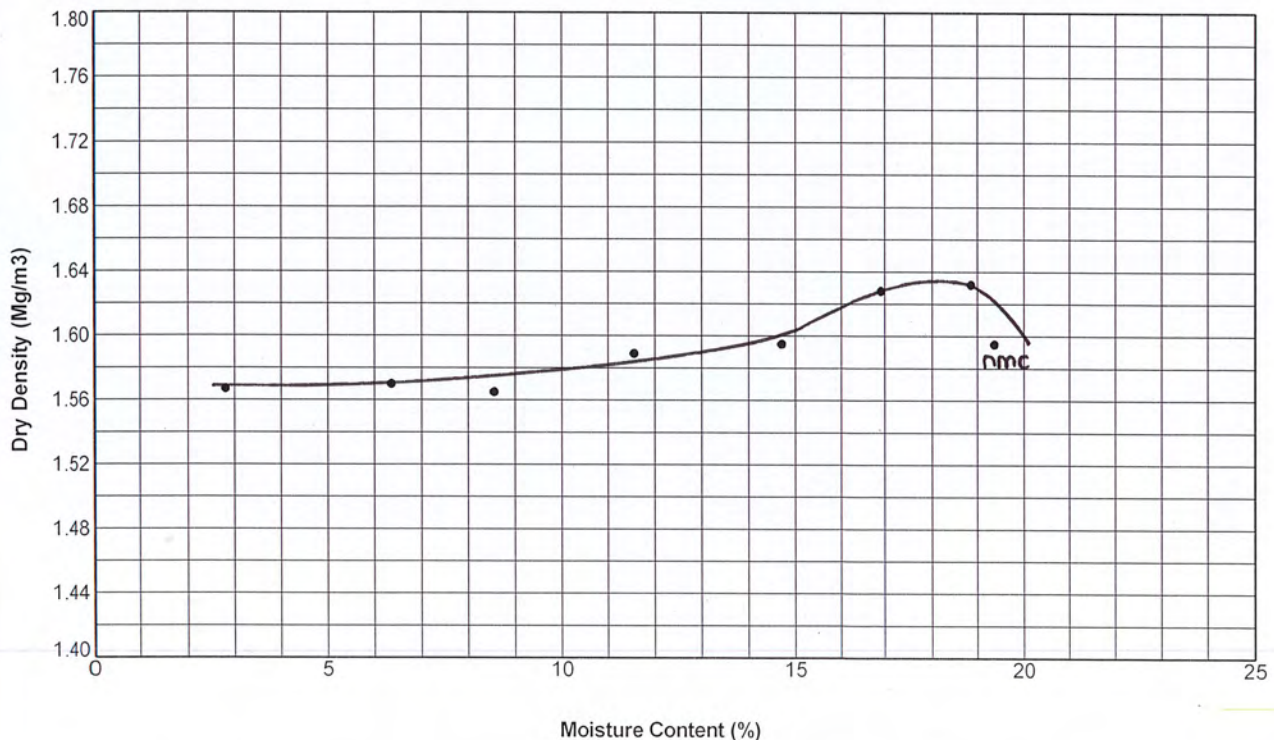
Maximum Dry Density (Mg/m³) = 1.63

Retained on 20mm Sieve (%) = 4.0

Date Tested = 12/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



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Name :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH04

Depth (m) :- 4.95

Sample Type & No :- B18

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 19

Particle Density (Measured) = 2.70

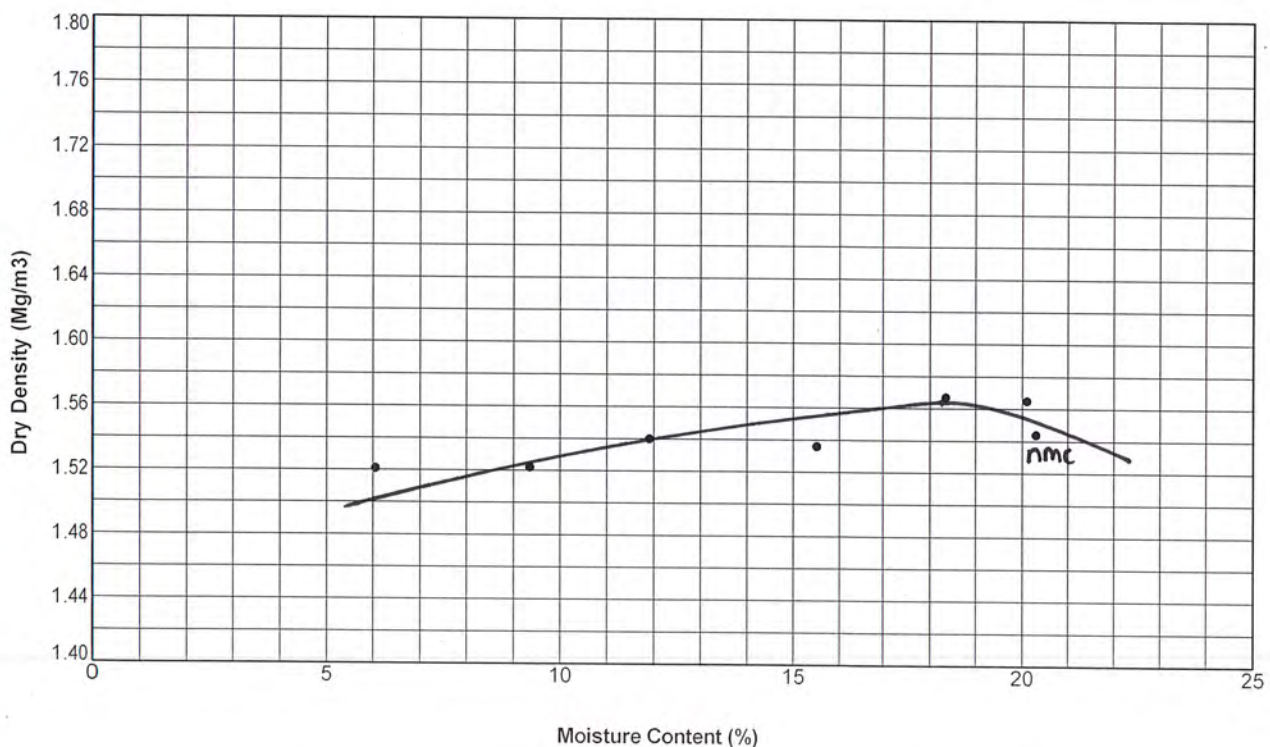
Maximum Dry Density (Mg/m³) = 1.57

Retained on 20mm Sieve (%) = 0.0

Date Tested = 16/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

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Name :-

M. SELKIRK

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Date of issue :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH04

Depth (m) :- 4.95

Sample Type & No :- B18

Test Method

Vibro Hammer Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 14

Particle Density (Measured) = 2.70

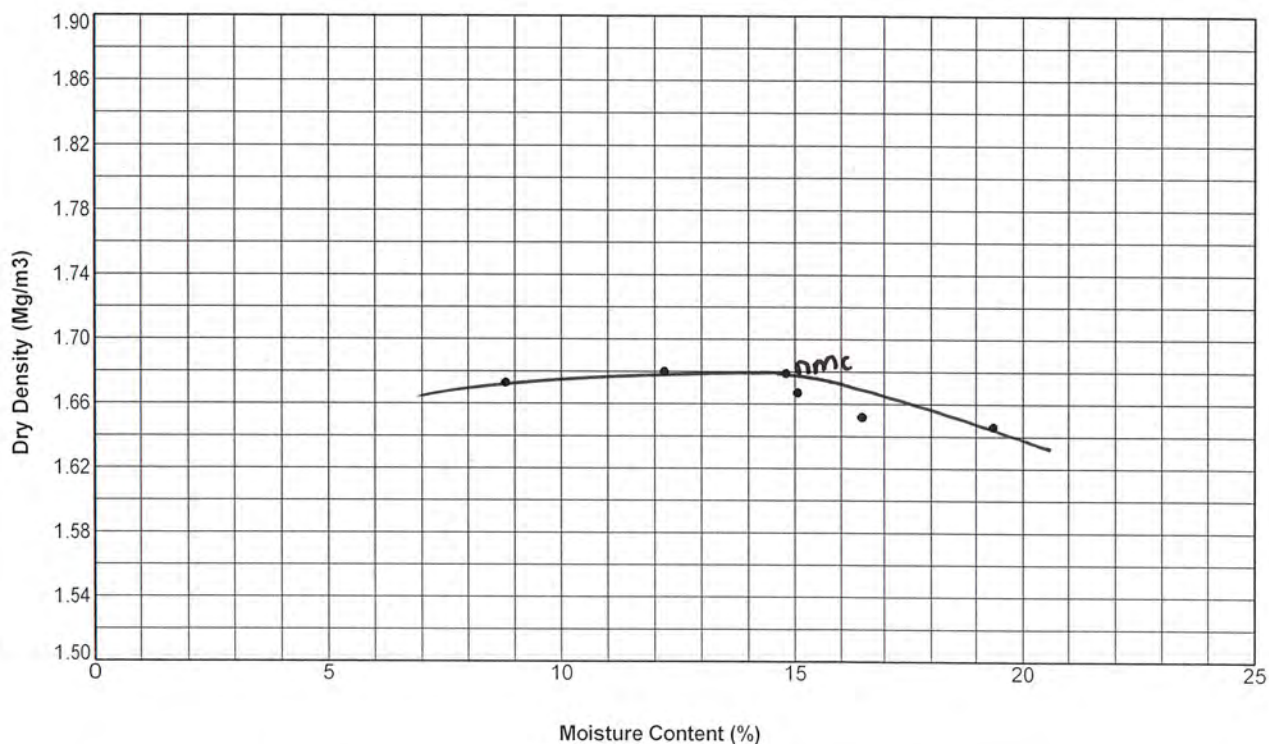
Maximum Dry Density (Mg/m³) = 1.68

Retained on 20mm Sieve (%) = 0.0

Date Tested = 16/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue :-

09/09/2021

Name :-

M. SELKIRK

Certificate No :-

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AEG Contract No. :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH09

Depth (m) :- 4.85

Sample Type & No :- B18

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 15

Particle Density (Assumed) = 2.30

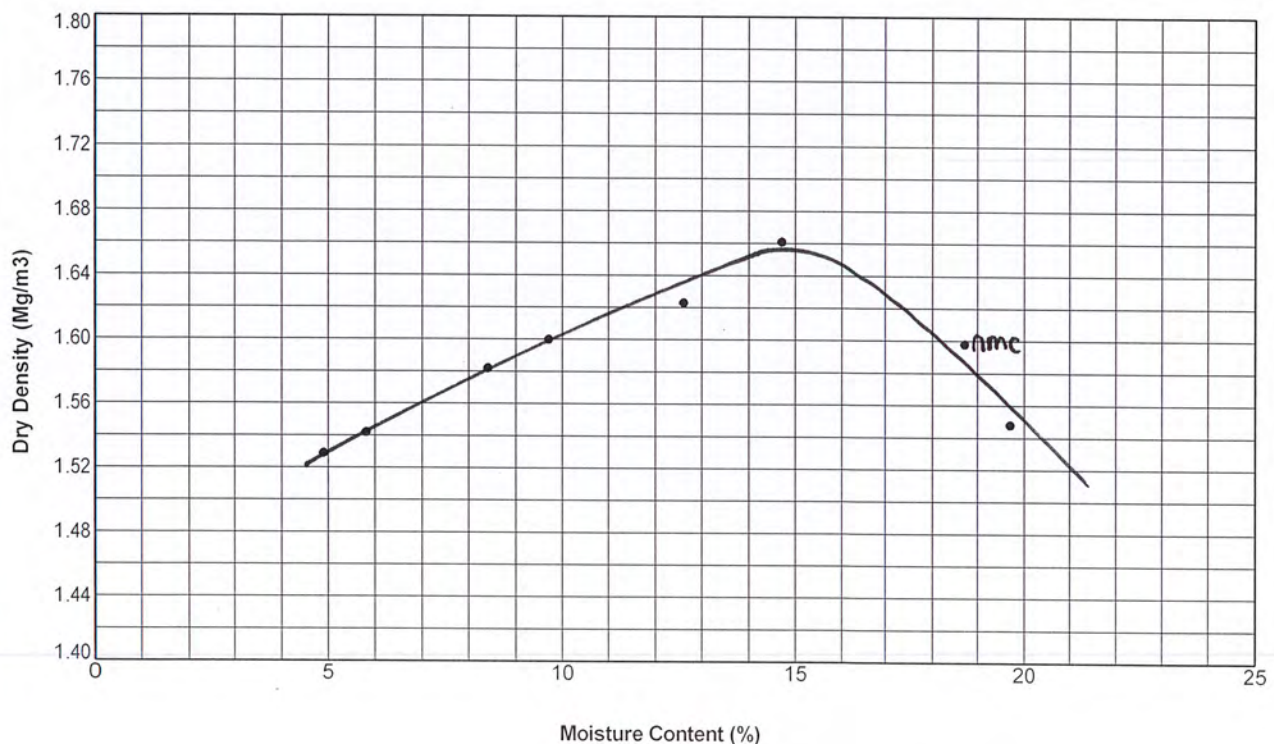
Maximum Dry Density (Mg/m³) = 1.66

Retained on 20mm Sieve (%) = 0.0

Date Tested = 12/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

[Redacted Signature]

Name :-

M. SELKIRK

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Date of issue :-

31/08/2021

Certificate No :-

COMP/4339/1

AEG Contract No. :-

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ALLIED EXPLORATION & GEOTECHNICS LIMITED

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH13

Depth (m) :- 4.20

Sample Type & No :- B19

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 20

Particle Density (Assumed) = 2.60

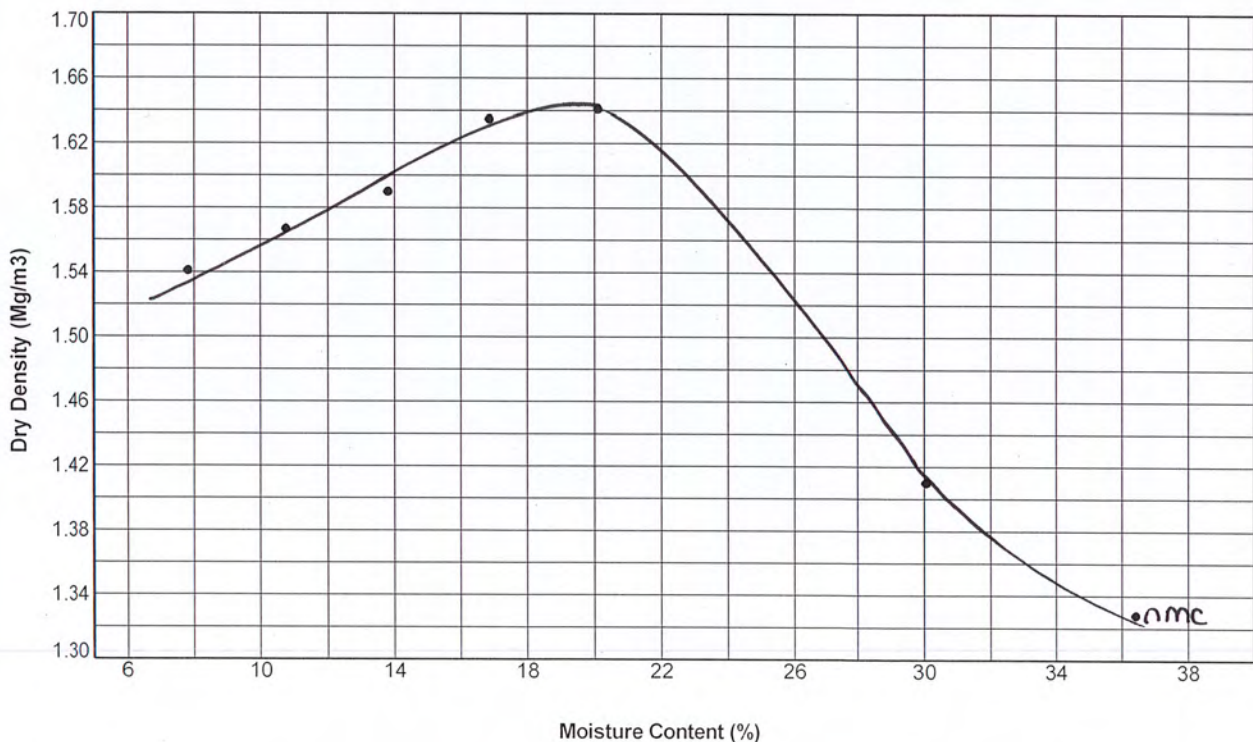
Maximum Dry Density (Mg/m³) = 1.64

Retained on 20mm Sieve (%) = 0.0

Date Tested = 02/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue :-

02/09/2021

Name :-

M. SELKIRK

Certificate No :-

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AEG Contract No. :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH15

Depth (m) :- 1.25

Sample Type & No :- B6

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 16

Particle Density (Assumed) = 2.75

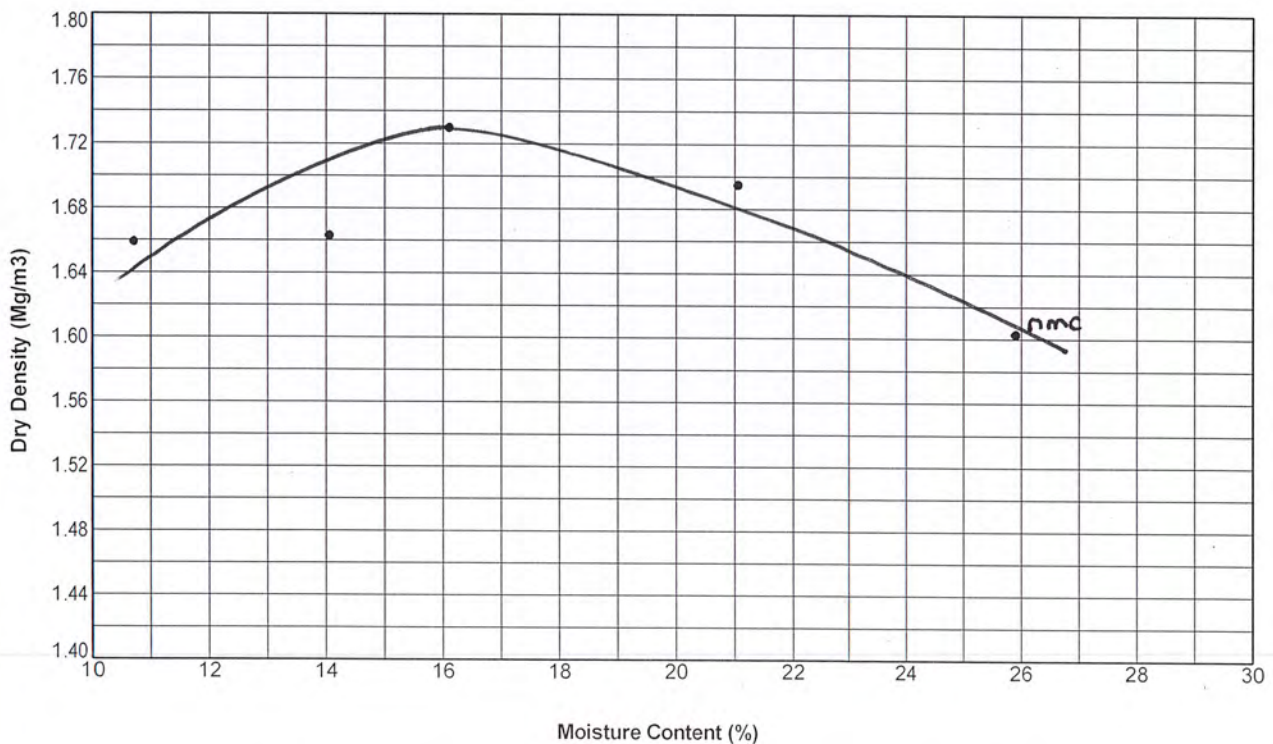
Maximum Dry Density (Mg/m³) = 1.73

Retained on 20mm Sieve (%) = 15.0

Date Tested = 30/07/2021

Retained on 37.5mm Sieve (%) = 11.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue :-

31/08/2021

Name :-

M. SELKIRK

Certificate No :-

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AEG Contract No. :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH16

Depth (m) :- 2.50

Sample Type & No :- B14

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 19

Particle Density (Assumed) = 2.65

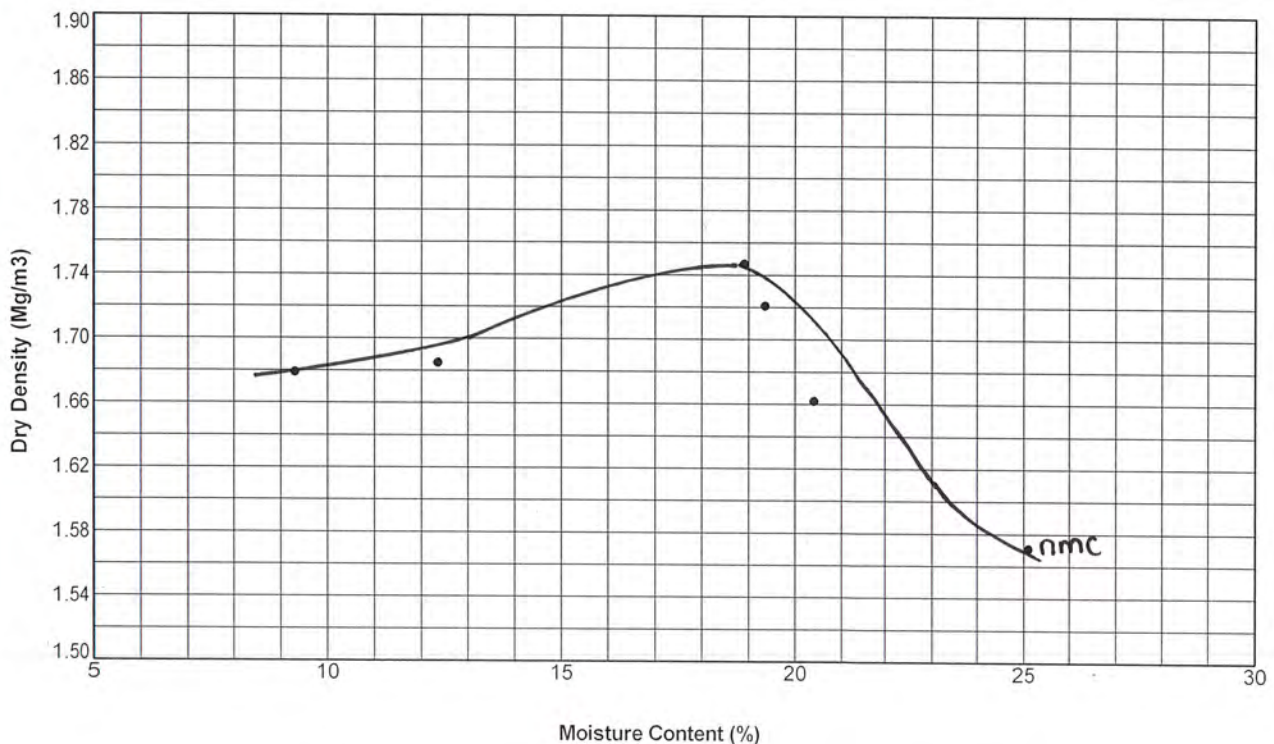
Maximum Dry Density (Mg/m³) = 1.75

Retained on 20mm Sieve (%) = 11.6

Date Tested = 30/07/2021

Retained on 37.5mm Sieve (%) = 8.3

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



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[Redacted Signature]

Name :-

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Date of issue :-

02/09/2021

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\BH17

Depth (m) :- 1.20

Sample Type & No :- B8

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 14

Particle Density (Assumed) = 2.75

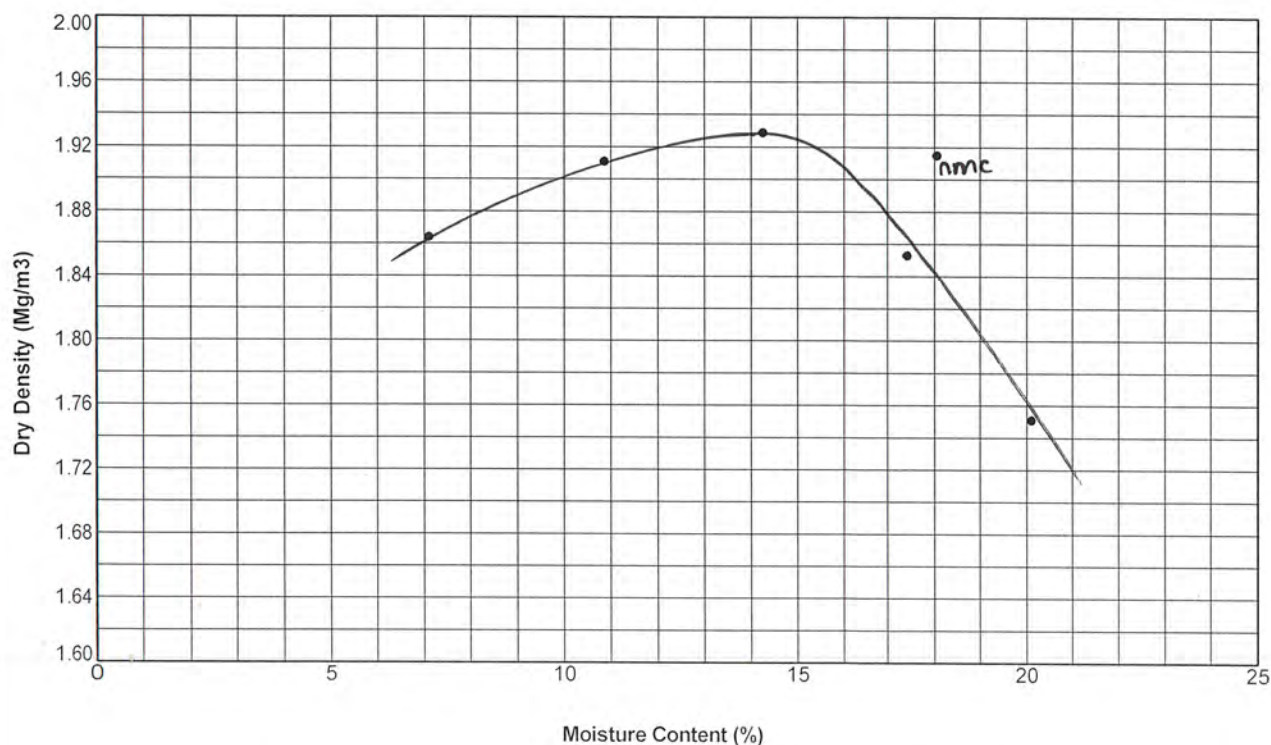
Maximum Dry Density (Mg/m³) = 1.93

Retained on 20mm Sieve (%) = 2.3

Date Tested = 27/08/2021

Retained on 37.5mm Sieve (%) = 0.0

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue :-

07/09/2021

Name :-

M. SELKIRK

Certificate No :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\TP01

Depth (m) :- 0.40

Sample Type & No :- B3

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 18

Particle Density (Assumed) = 2.65

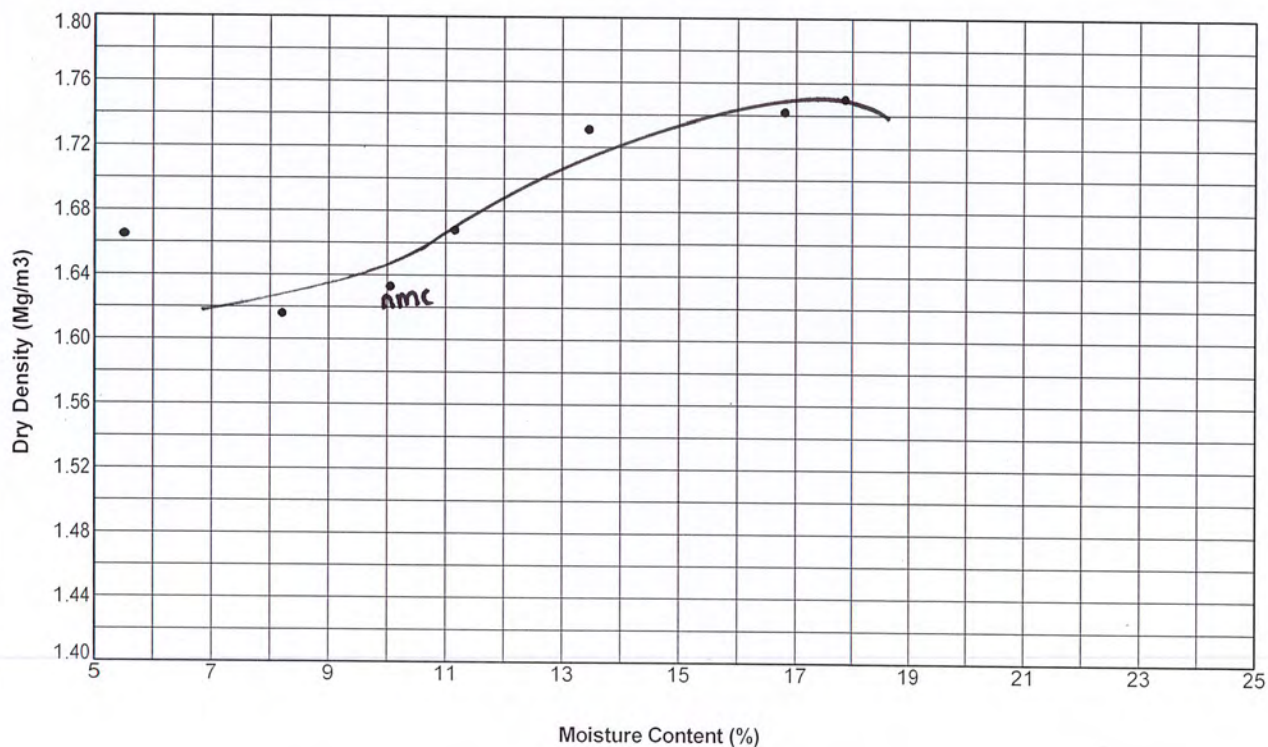
Maximum Dry Density (Mg/m³) = 1.75

Retained on 20mm Sieve (%) = 15.7

Date Tested = 16/08/2021

Retained on 37.5mm Sieve (%) = 4.5

Remarks : Unable to achieve a definitive peak



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-



Name :-

M. SELKIRK

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Date of issue :-

31/08/2021

Certificate No :-

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AEG Contract No. :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MSITP01

Depth (m) :- 0.40

Sample Type & No :- B3

Test Method

Vibro Hammer Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 10

Particle Density (Assumed) = 2.65

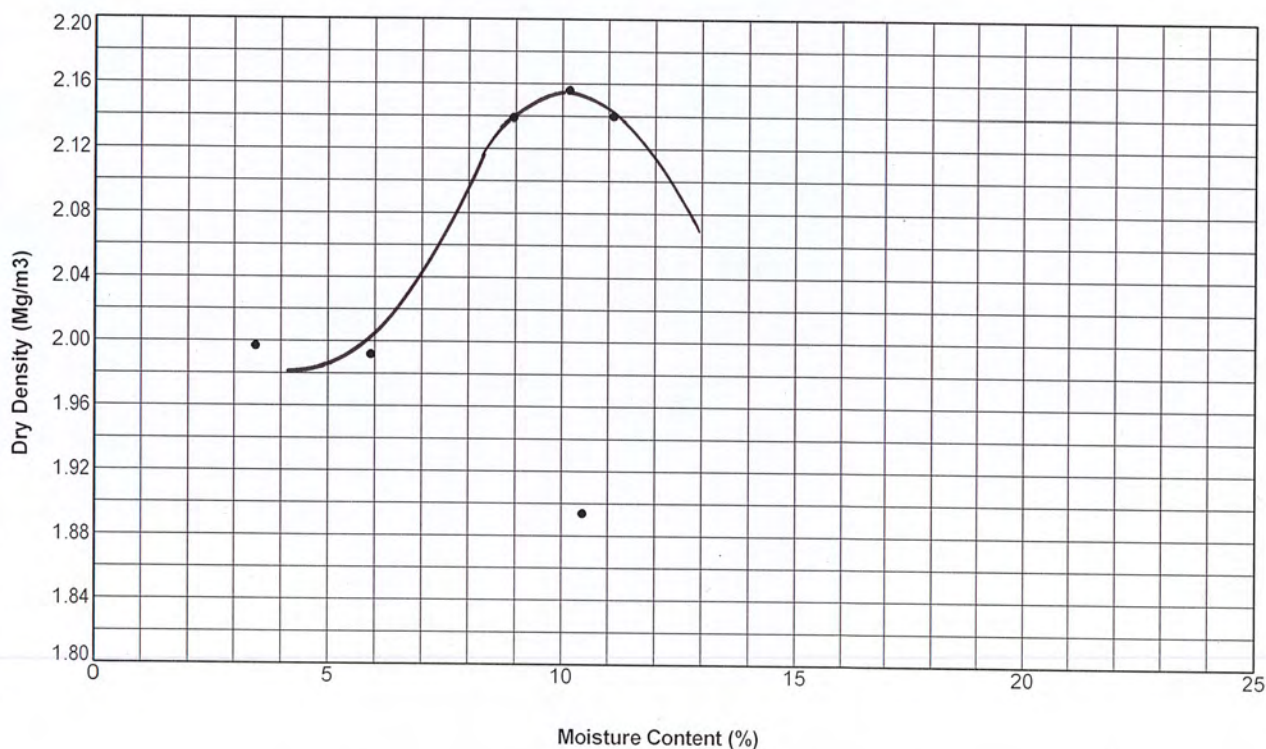
Maximum Dry Density (Mg/m³) = 2.15

Retained on 20mm Sieve (%) = 15.7

Date Tested = 16/08/2021

Retained on 37.5mm Sieve (%) = 4.5

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue :-

10/09/2021

Name :-

M. SELKIRK

Certificate No :-

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AEG Contract No. :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MSITP01

Depth (m) :- 2.40

Sample Type & No :- B13

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 14

Particle Density (Assumed) = 2.75

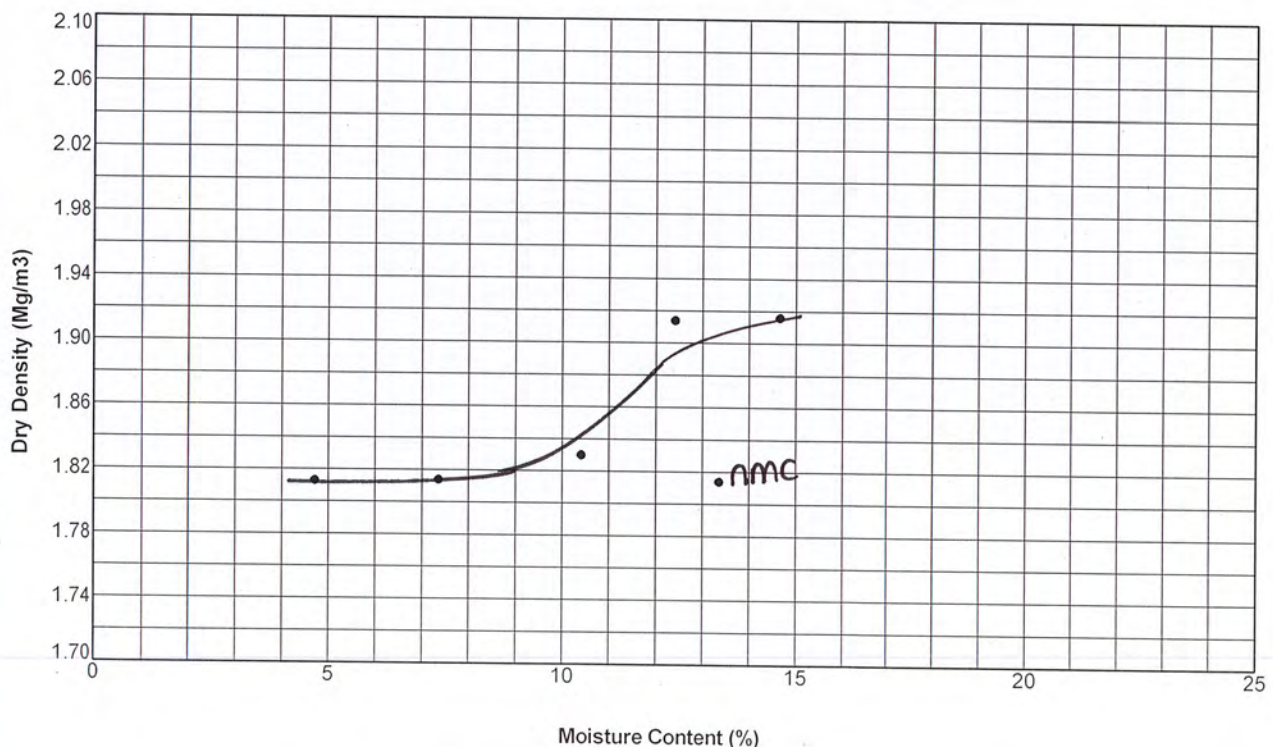
Maximum Dry Density (Mg/m³) = 1.91

Retained on 20mm Sieve (%) = 30.1

Date Tested = 10/08/2021

Retained on 37.5mm Sieve (%) = 18.5

Remarks : Unable to achieve a definitive peak



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

[Redacted Signature]

Name :-

M. SELKIRK

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Date of issue :-

03/09/2021

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MSITP01

Depth (m) :- 3.40

Sample Type & No :- B17

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 17

Particle Density (Assumed) = 2.30

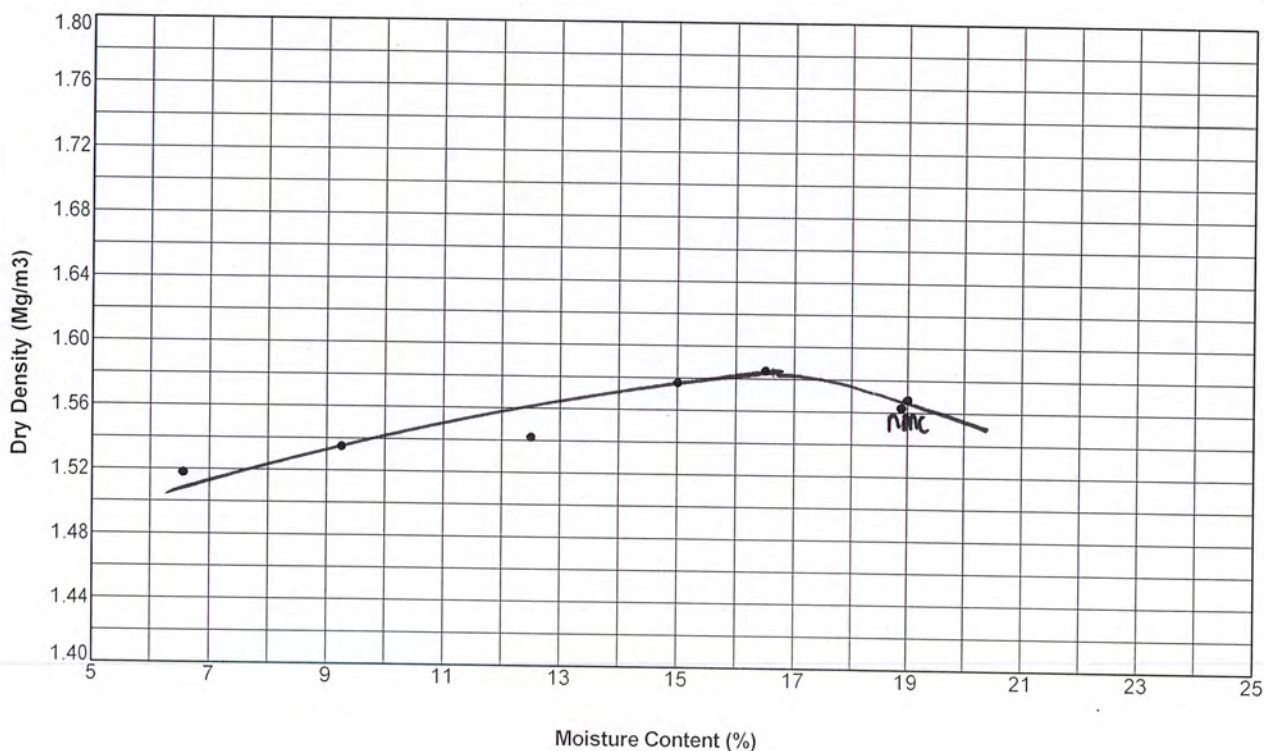
Maximum Dry Density (Mg/m³) = 1.59

Retained on 20mm Sieve (%) = 2.6

Date Tested = 17/08/2021

Retained on 37.5mm Sieve (%) = 0.9

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



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Date of issue :-

31/08/2021

Name :-

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Certificate No :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- MS\TP01

Depth (m) :- 3.40

Sample Type & No :- B17

Test Method

Vibro Hammer Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = 17

Particle Density (Assumed) = 2.30

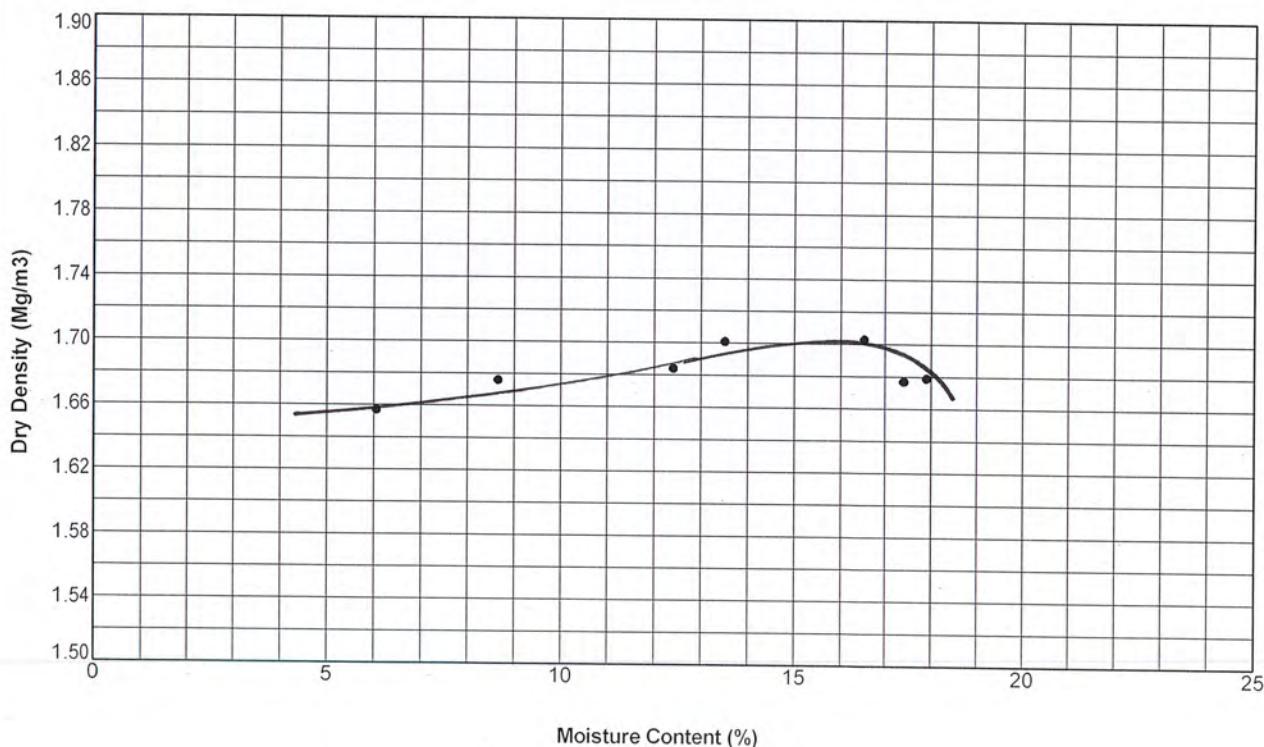
Maximum Dry Density (Mg/m³) = 1.70

Retained on 20mm Sieve (%) = 2.6

Date Tested = 17/08/2021

Retained on 37.5mm Sieve (%) = 0.9

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

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Name :-

M. SELKIRK

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Date of issue :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **MSITP05**

Depth (m) :- **0.40**

Sample Type & No :- **B3**

Test Method

2.5kg Compaction

Single Sample

Test Results

Optimum Moisture Content (%) = **14**

Particle Density (Assumed) = **2.75**

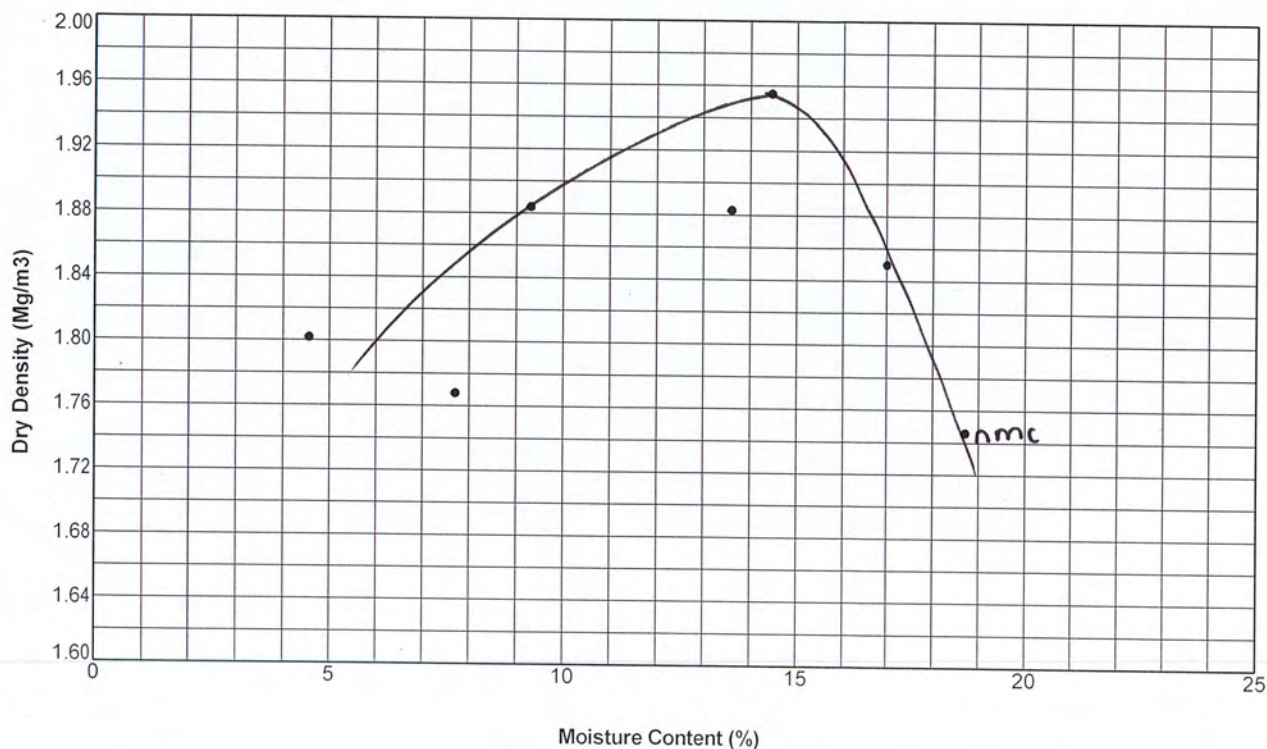
Maximum Dry Density (Mg/m³) = **1.95**

Retained on 20mm Sieve (%) = **28.4**

Date Tested = **13/08/2021**

Retained on 37.5mm Sieve (%) = **11.1**

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



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Name :-

M. SELKIRK

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Date of issue :-

07/09/2021

Certificate No :-

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Determination of MCV/Moisture Relationship



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

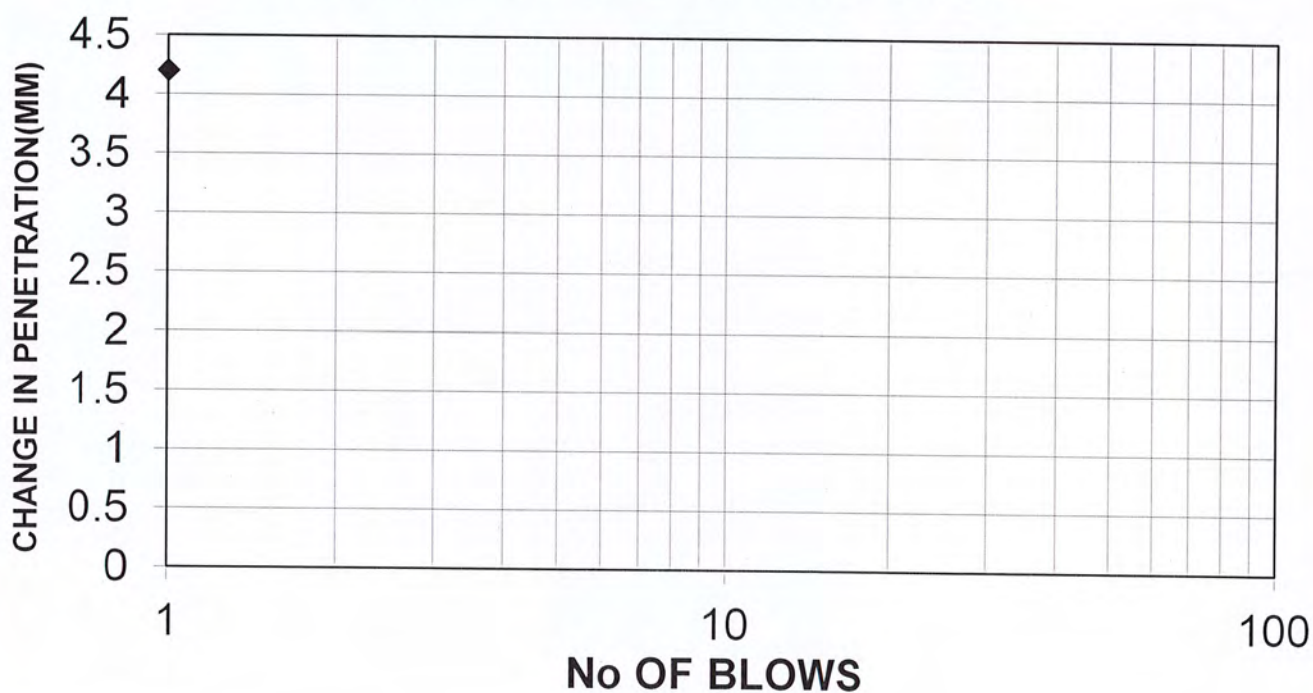
Unit 25 Stella Gill Industrial Estate, Pelton Fell

Chester-le-Street, Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)

No. 1367

SITE: Preliminary Onshore Ground Investigation for NZT**JOB No:** 4339**CLIENT:** AECOM**Depth:** 2.70m**Sample No:** MS\BH02 B14**Specific Depth:** N/A**For sample description please refer to sample description sheet.****CHANGE IN PENETRATION PLOT**

Sample	NAT
MCV	N/A
M.C.(%)	24
MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION	

Remarks: 0% Retained on 20mm sieve

Test attempted and material type proven unsuitable

DATE TESTED: 02/08/2021

DATE OF ISSUE: 10/09/2021

APPROVED BY:

NAME: Michelle Selkirk

**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

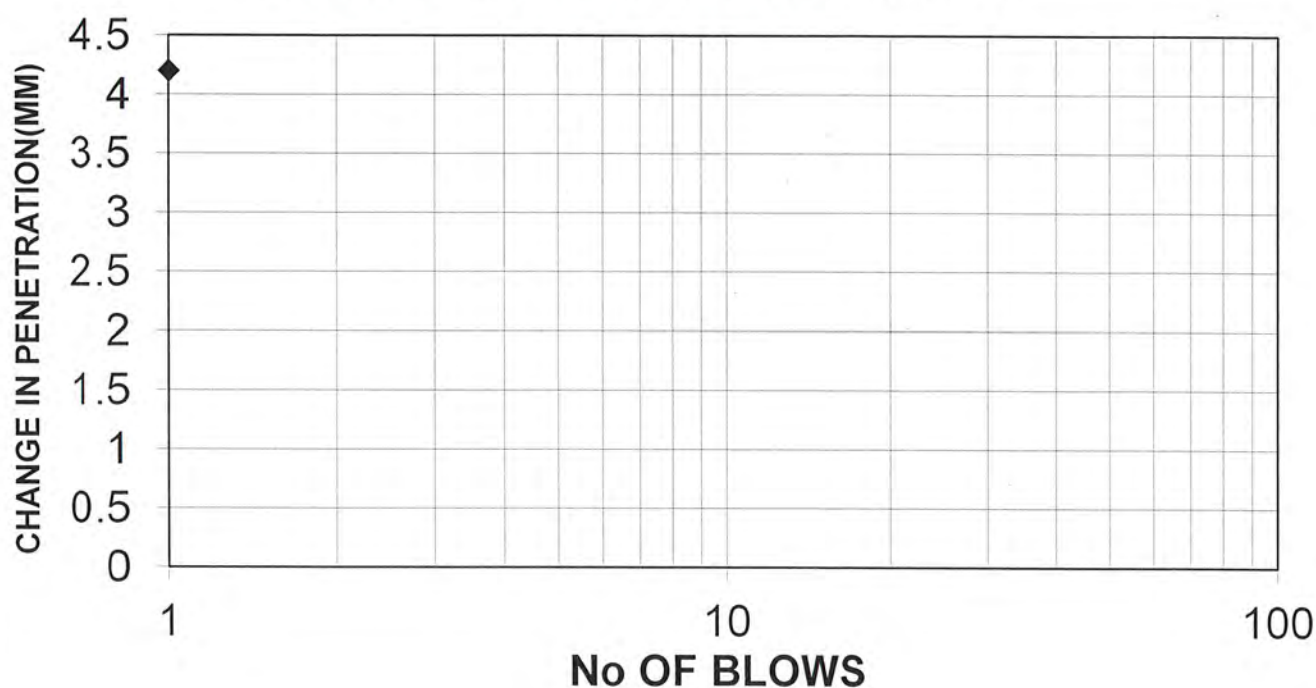
Unit 25 Stella Gill Industrial Estate, Pelton Fell

Chester-le-Street, Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)

No. 1367

SITE: Preliminary Onshore Ground Investigation for NZT**JOB No:** 4339**CLIENT:** AECOM**Depth:** 2.80m**Sample No:** MS\BH03 B16**Specific Depth:** N/A**For sample description please refer to sample description sheet.****CHANGE IN PENETRATION PLOT**

Sample	NAT
MCV	N/A
M.C.(%)	16
MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION	

Remarks: 2.9% Retained on 20mm sieve

Test attempted and material type proven unsuitable

DATE TESTED: 04/08/2021

DATE OF ISSUE: 10/09/2021

APPROVED BY:

NAME: Michelle Selkirk

**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

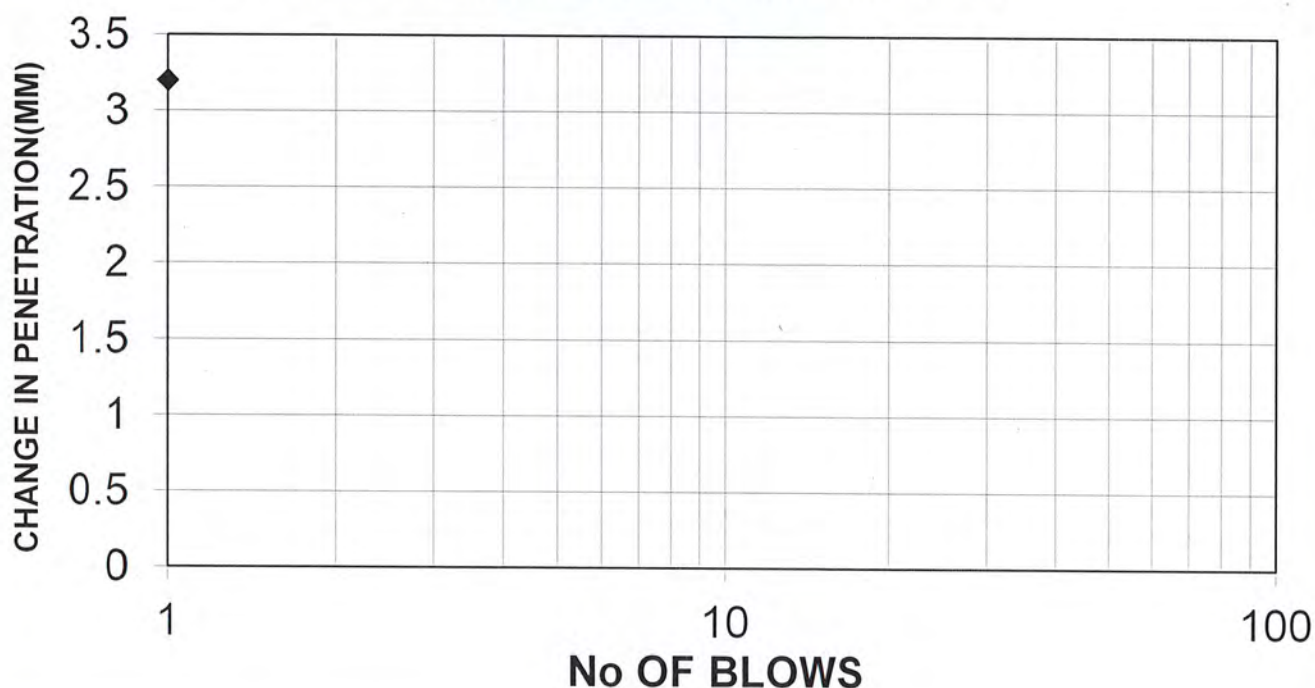
Unit 25 Stella Gill Industrial Estate , Pelton Fell

Chester-le-Street , Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)

No. 1367

SITE: Preliminary Onshore Ground Investigation for NZT**JOB No:** 4339**CLIENT:** AECOM**Depth:** 2.70m**Sample No:** MS\BH04 B12**Specific Depth:** N/A**For sample description please refer to sample description sheet.****CHANGE IN PENETRATION PLOT**

Sample	NAT
MCV	N/A
M.C.(%)	19
MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION	

Remarks: 0.5% Retained on 20mm sieve

Test attempted and material type proven unsuitable

DATE TESTED: 19/08/2021

DATE OF ISSUE: 10/09/2021

APPROVED BY:

NAME: Michelle Selkirk

**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

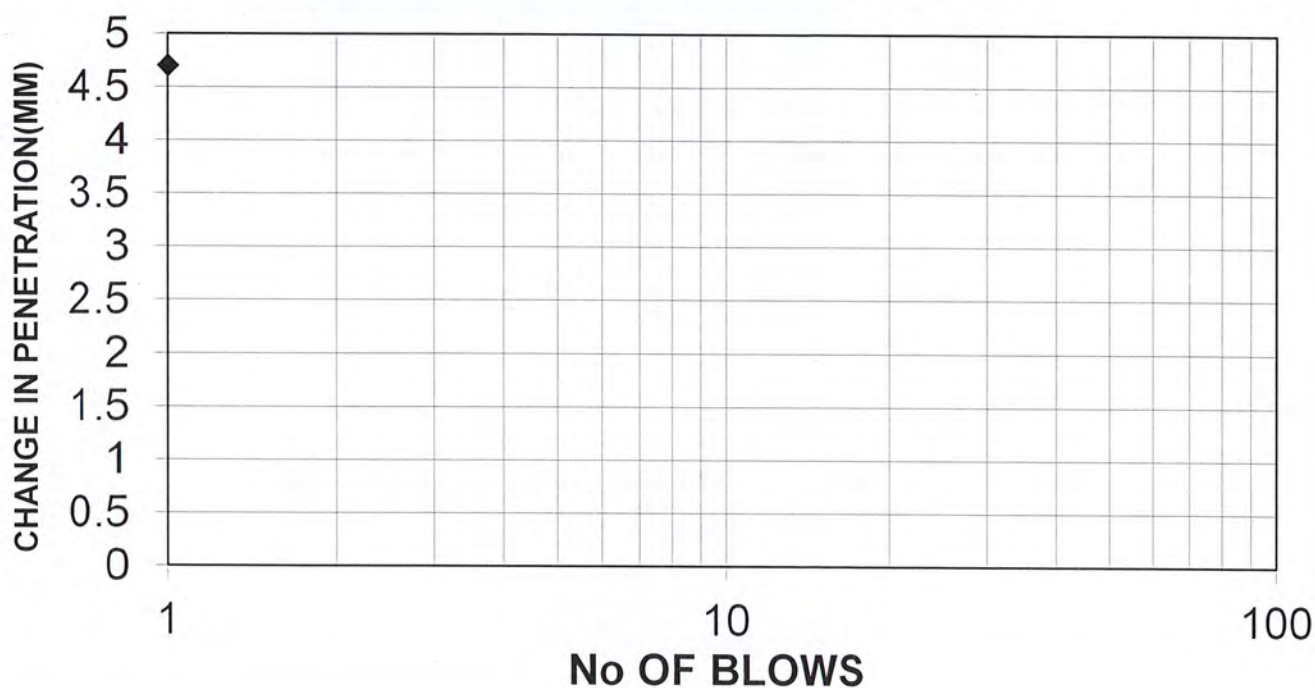
Unit 25 Stella Gill Industrial Estate, Pelton Fell

Chester-le-Street, Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)

No. 1367

SITE: Preliminary Onshore Ground Investigation for NZT**JOB No:** 4339**CLIENT:** AECOM**Depth:** 4.95m**Sample No:** MS\BH04 B18**Specific Depth:** N/A**For sample description please refer to sample description sheet.****CHANGE IN PENETRATION PLOT**

Sample	NAT
MCV	N/A
M.C.(%)	21
MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION	

Remarks: 0% Retained on 20mm sieve

Test attempted and material type proven unsuitable

DATE TESTED: 19/08/2021

DATE OF ISSUE: 10/09/2021

APPROVED BY:

NAME: Michelle Selkirk



ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell

Chester-le-Street, Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)


No. 1367

SITE: Preliminary Onshore Ground Investigation for NZT

JOB No: 4339

CLIENT: AECOM

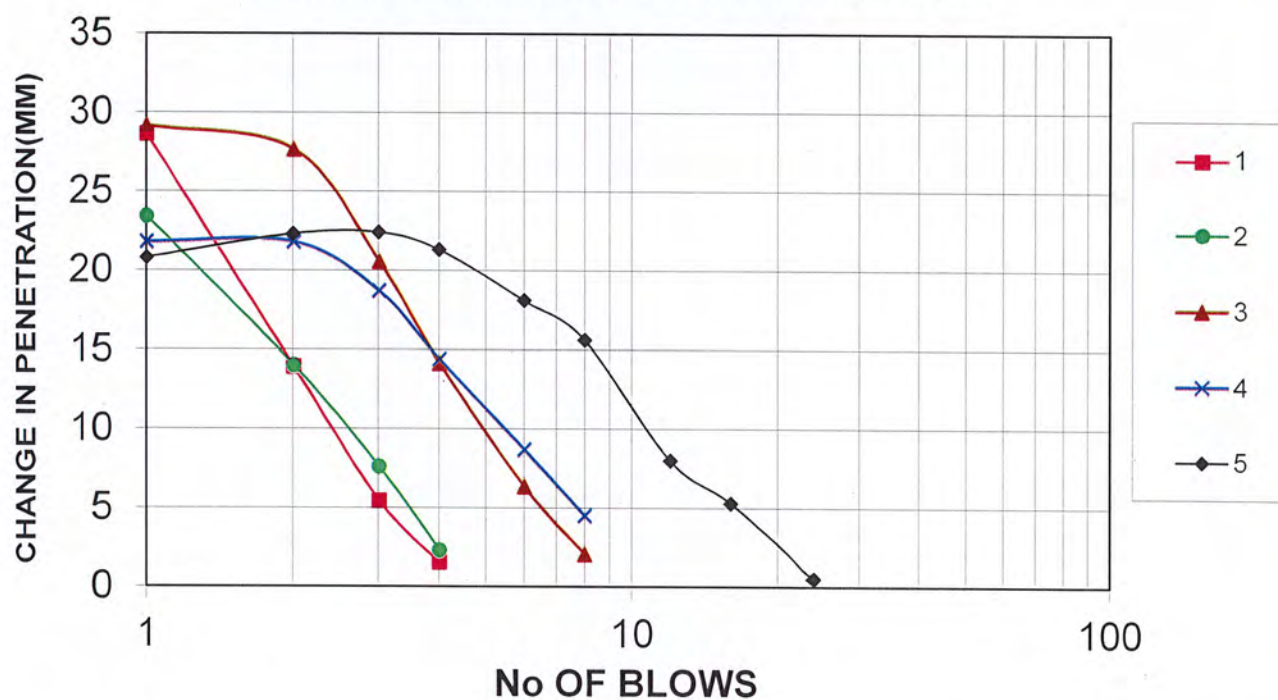
Depth: 4.20m

Sample No: MS\BH13 B19

Specific Depth: N/A

For sample description please refer to sample description sheet.

CHANGE IN PENETRATION PLOT



Sample	1	2	3	4	5
MCV	5.0	5.5	8.2	8.8	12.2
M.C.(%)	31	29	28	25	22
MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION					

Remarks: 0% Retained on 20mm sieve.

DATE TESTED: 02/08/2021

DATE OF ISSUE: 15/09/2021

APPROVED BY:

NAME: Michelle Selkirk

**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

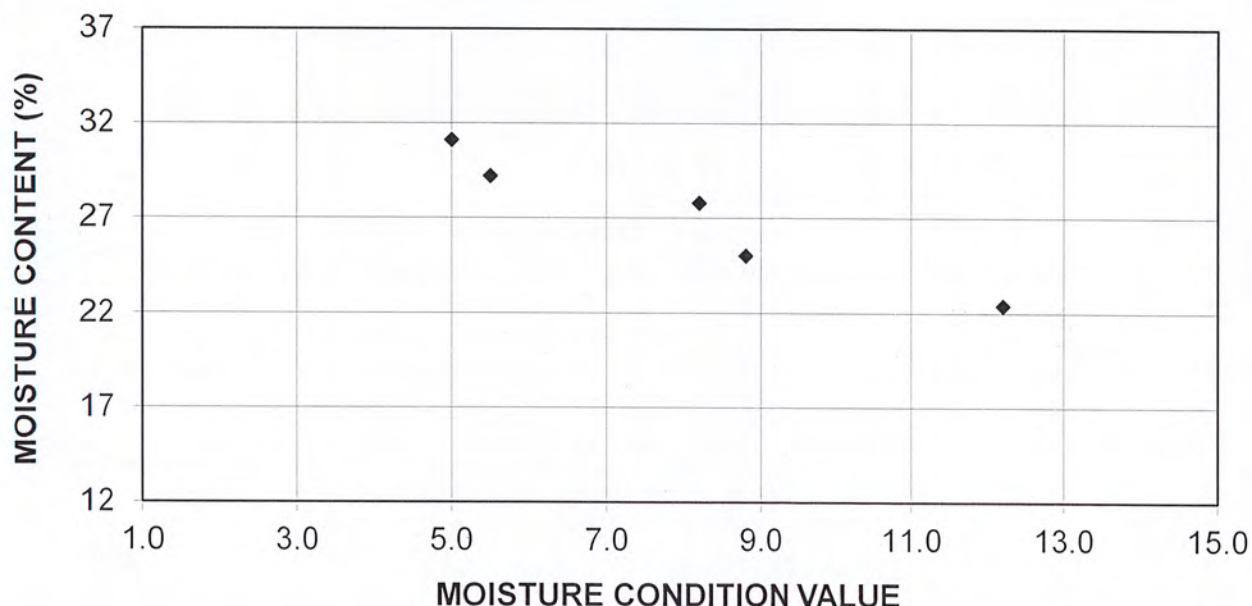
Unit 25 Stella Gill Industrial Estate, Pelton Fell

Chester-le-Street, Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)

No. 1367

SITE: Preliminary Onshore Ground Investigation for NZT**JOB No:** 4339**CLIENT:** AECOM**Depth:** 4.20m**Sample No:** MS\BH13 B19**Specific Depth:** N/A**For sample description please refer to sample description sheet.****CALIBRATION LINE**

Sample	1	2	3	4	5
MCV	5.0	5.5	8.2	8.8	12.2
M.C.(%)	31	29	28	25	22
MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION					
INTERCEPT (MC% AXIS)			36.22	REMARKS: MCV at natural MC% not used	
SLOPE			-1.148		
SENSITIVITY (1/SLOPE)			-0.871		

**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

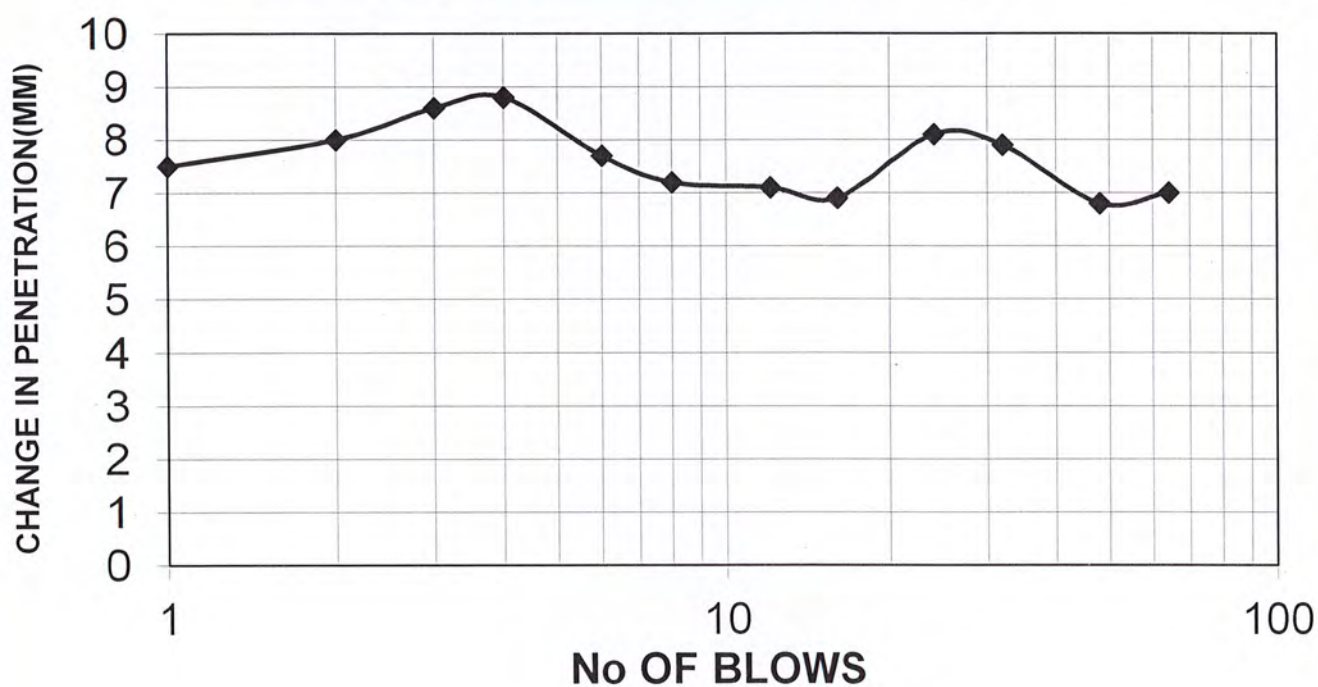
Unit 25 Stella Gill Industrial Estate, Pelton Fell

Chester-le-Street, Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)

No. 1367

SITE: Preliminary Onshore Ground Investigation for NZT**JOB No:** 4339**CLIENT:** AECOM**Depth:** 0.40m**Sample No:** MSITP01 B3**Specific Depth:** N/A**For sample description please refer to sample description sheet.****CHANGE IN PENETRATION PLOT**

Sample	NAT
MCV	N/A
M.C.(%)	10
MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION	

Remarks: 15.7% Retained on 20mm sieve

Test attempted and material type proven unsuitable

DATE TESTED: 18/08/2021

DATE OF ISSUE: 10/09/2021

APPROVED BY:

NAME: Michelle Selkirk


ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell

Chester-le-Street , Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)


No. 1367

SITE: Preliminary Onshore Ground Investigation for NZT

JOB No: 4339

CLIENT: AECOM

Depth: 3.40m

Sample No: MS\TP01 B17

Specific Depth: N/A

For sample description please refer to sample description sheet.
CHANGE IN PENETRATION PLOT


Sample	NAT
MCV	N/A
M.C.(%)	18
MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION	

Remarks: 2.6% Retained on 20mm sieve

Test attempted and material type proven unsuitable

DATE TESTED: 18/08/2021

DATE OF ISSUE: 10/09/2021

APPROVED BY:

NAME: Michelle Selkirk


ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell

Chester-le-Street, Co Durham DH2 2RG

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MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)


No. 1367

SITE: Preliminary Onshore Ground Investigation for NZT

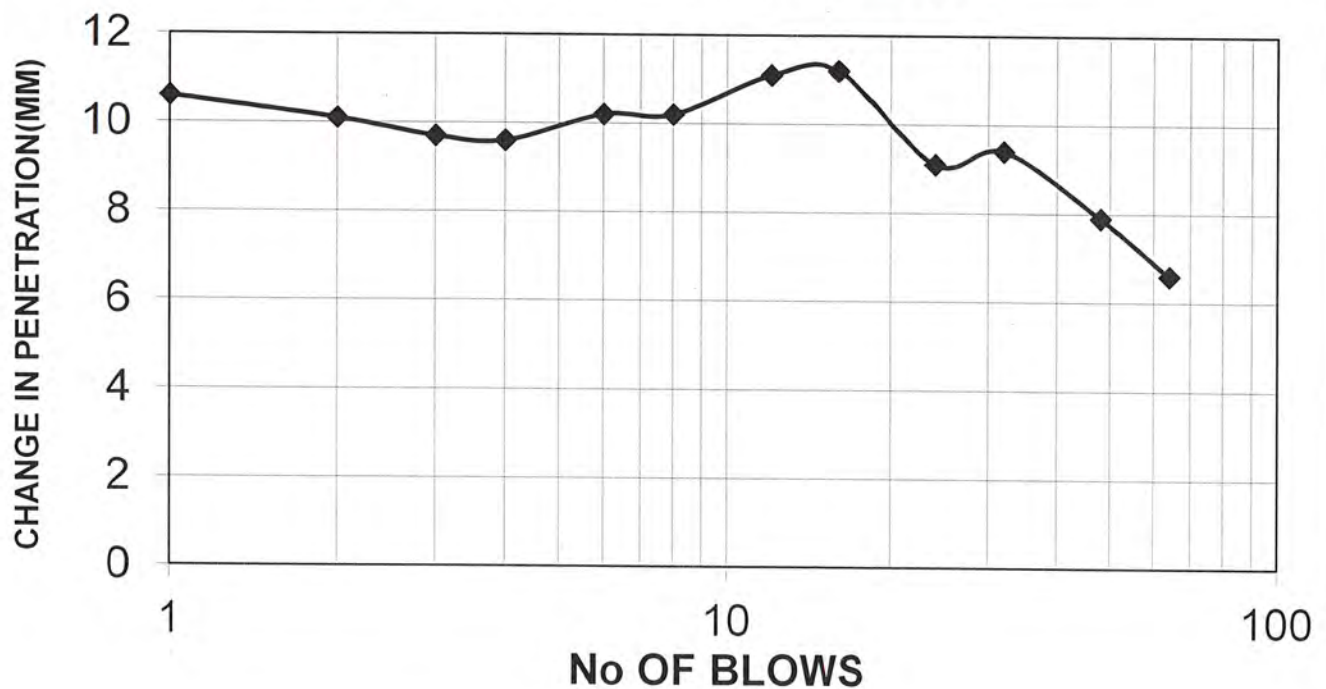
JOB No: 4339

CLIENT: AECOM

Depth: 0.40m

Sample No: MS\TP05 B3

Specific Depth: N/A

For sample description please refer to sample description sheet.
CHANGE IN PENETRATION PLOT


Sample	NAT
MCV	N/A
M.C.(%)	15
MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION	

Remarks: 28.4% Retained on 20mm sieve

Test attempted and material type proven unsuitable

DATE TESTED: 18/08/2021

DATE OF ISSUE: 10/09/2021

APPROVED BY:

NAME: Michelle Selkirk

Determination of California Bearing Ratio



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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

DETERMINATION OF THE CALIFORNIA BEARING RATIO

BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- **MS\BH02**

Sample No.- **B16**

Depth (m)- **3.40**

"As Received" Moisture Content (%) :

Surcharge (Kg) : 6

Retained on 20mm (%) : 0.0

Seating Load (N) : Top 50 / Bottom 50

Correction Needed : No

Test Moisture Content (%) : Top 22 / Bottom 22

Soaking Time (Days) : 14

Bulk Density (Mg/m^3) : 1.89

Swelling (mm) : 0.67

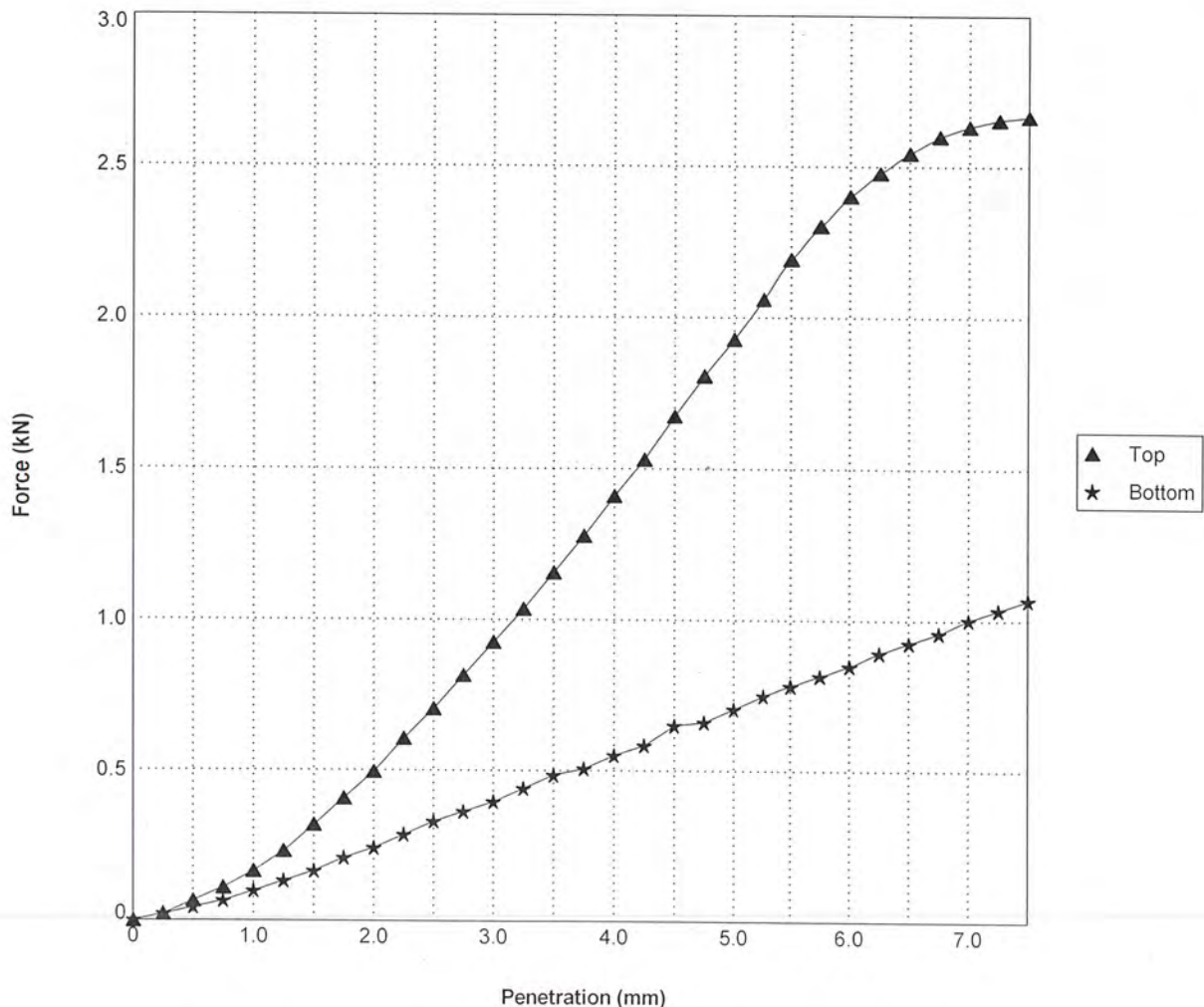
Dry Density (Mg/m^3) : 1.55

Date Tested : 05/08/2021

CBR Value (%) : Top 9.6 / Bottom 3.5

Preparation Method : 2.5kg Compaction

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue :-

31/08/2021

Name :-

M. SELKIRK

Certificate No :-

CBR/4339/MS\BH02/B16/3.40/1

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AEG Contract No. :-

4339



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DETERMINATION OF THE CALIFORNIA BEARING RATIO

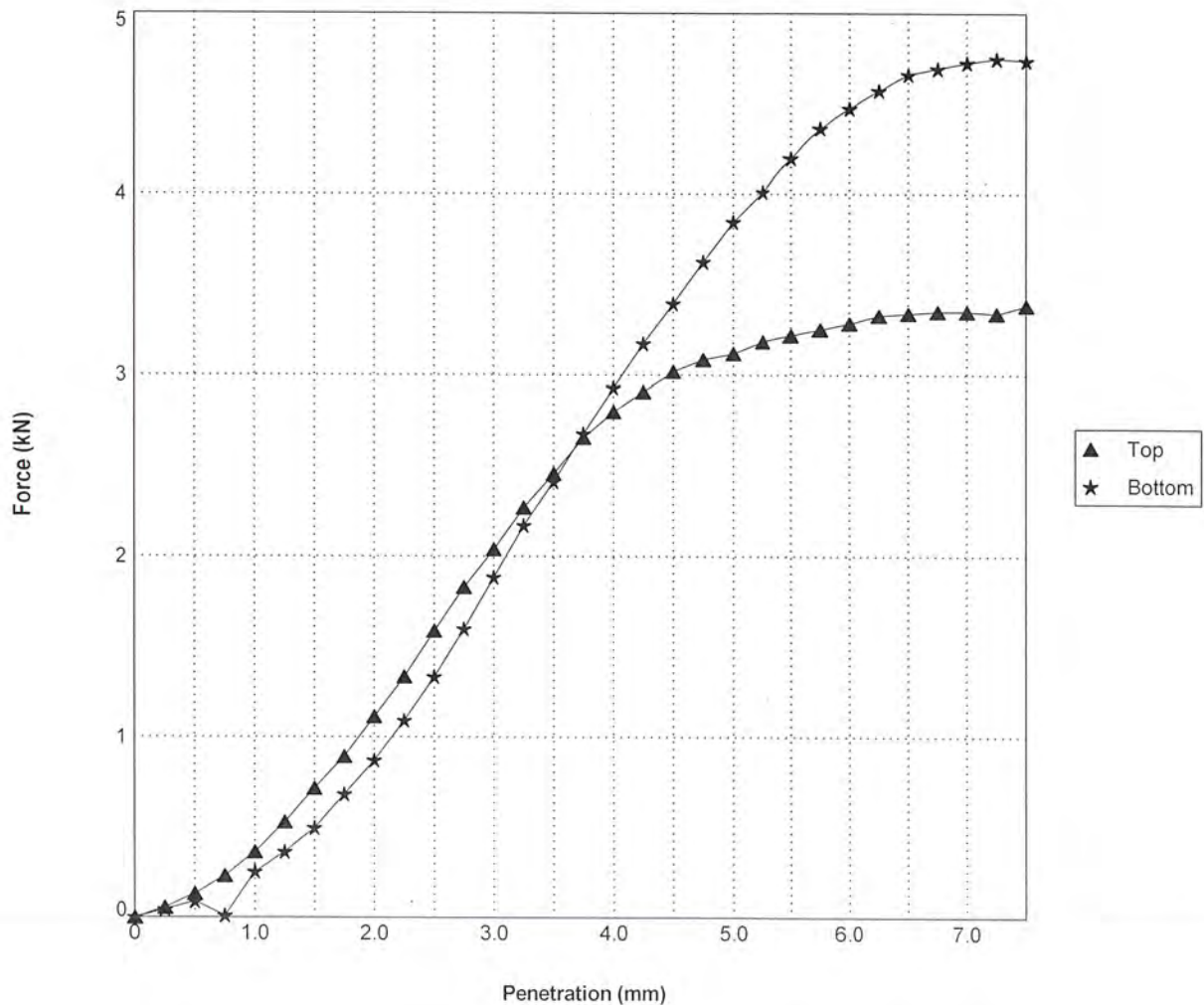
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- **MS\BH03**

Sample No.- **B16**

Depth (m)- **2.80**

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	2.0	Seating Load (N) :	Top 50 / Bottom 50
Correction Needed :	Yes	Test Moisture Content (%) :	Top 17 / Bottom 16
Soaking Time (Days) :	7	Bulk Density (Mg/m^3) :	2.04
Swelling (mm) :	0.09	Dry Density (Mg/m^3) :	1.75
Date Tested :	04/08/2021	CBR Value (%) :	Top 16 / Bottom 22
Preparation Method :	2.5kg Compaction		
Remarks :			



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

Contract Title :-
Preliminary Onshore Ground Investigation for NZT

Client :-
AECOM



Signed :-

[Redacted Signature]

Name :-

M. SELKIRK

Page 1 of 1

Date of issue :-

19/08/2021

Certificate No. :-

CBR/4339/MS\BH03/B16/2.80/1

AEG Contract No. :-

4339



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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DETERMINATION OF THE CALIFORNIA BEARING RATIO

BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- **MS\BH04**

Sample No.- **B12**

Depth (m)- **2.70**

"As Received" Moisture Content (%) :

Surcharge (Kg) : 6

Retained on 20mm (%) : 4.0

Seating Load (N) : Top 50 / Bottom 50

Correction Needed : No

Test Moisture Content (%) : Top 20 / Bottom 19

Soaking Time (Days) : 13

Bulk Density (Mg/m³) : 1.93

Swelling (mm) : 0.19

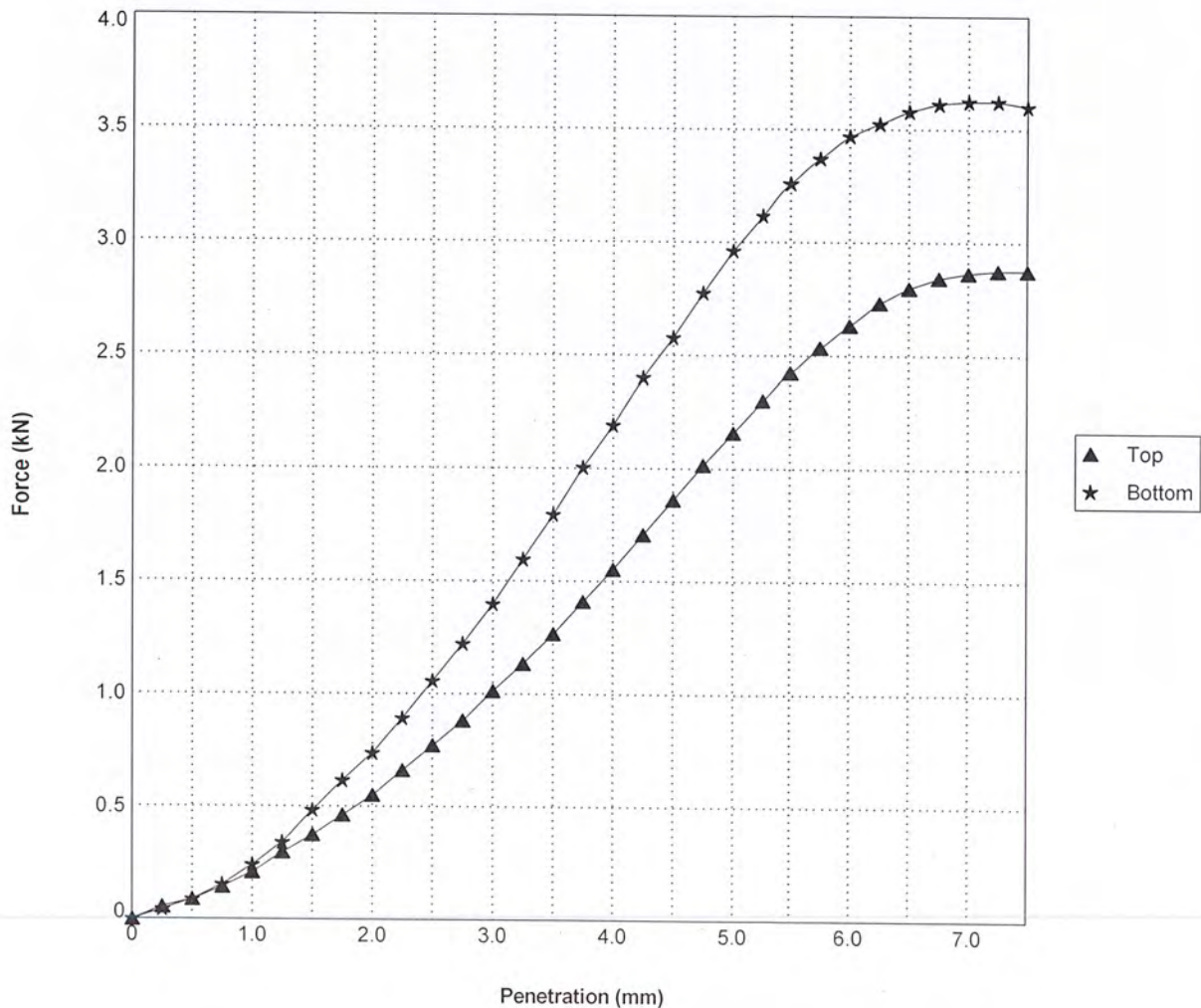
Dry Density (Mg/m³) : 1.61

Date Tested : 13/08/2021

CBR Value (%) : Top 11 / Bottom 15

Preparation Method : 2.5kg Compaction

Remarks :



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

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Client :-

AECOM



Signed :-

Date of issue :-

31/08/2021

Name :-

M. SELKIRK

Certificate No :-

CBR/4339/MS\BH04/B12/2.70/1

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AEG Contract No. :-

4339

