

PROJECT No : 4339

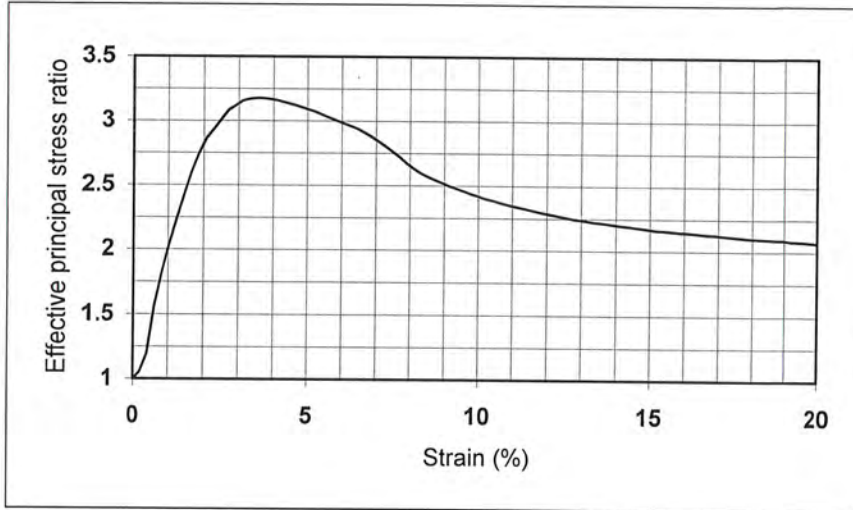
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH07

SAMPLE No : U54

DEPTH (m) : 17.10

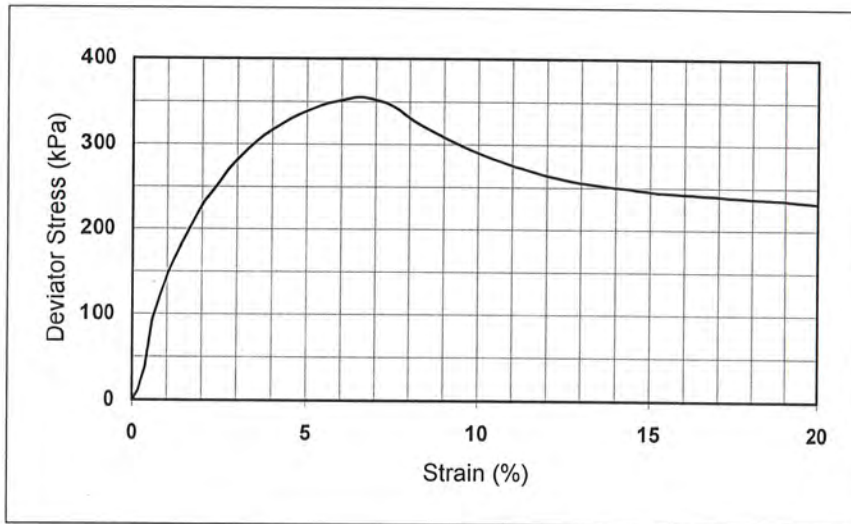


**Failure Conditions**

**Specimen 1**

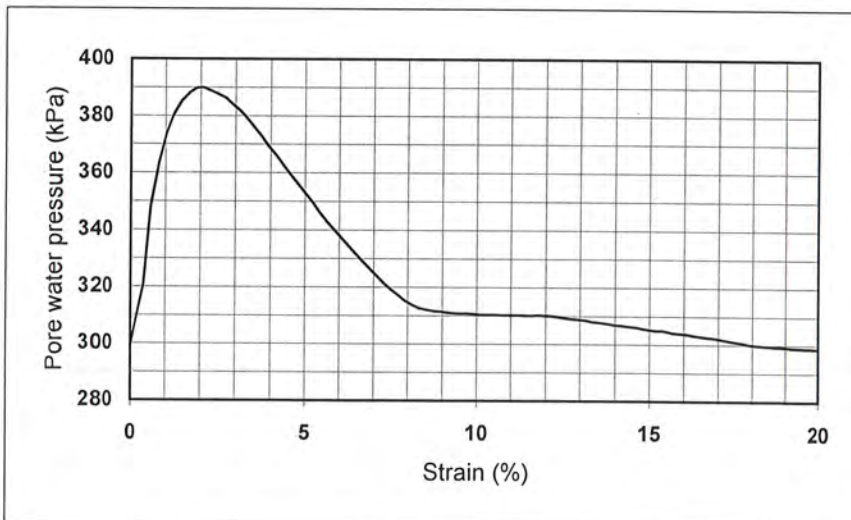
**At maximum stress ratio**

<i>strain</i>	3.54 %
<i>deviator stress</i>	302.9 kPa
<i>stress ratio</i>	3.18



**At maximum deviator stress**

<i>strain</i>	6.44 %
<i>deviator stress</i>	355.3 kPa
<i>stress ratio</i>	2.94



**FAILURE MODE**

PROJECT No : 4339

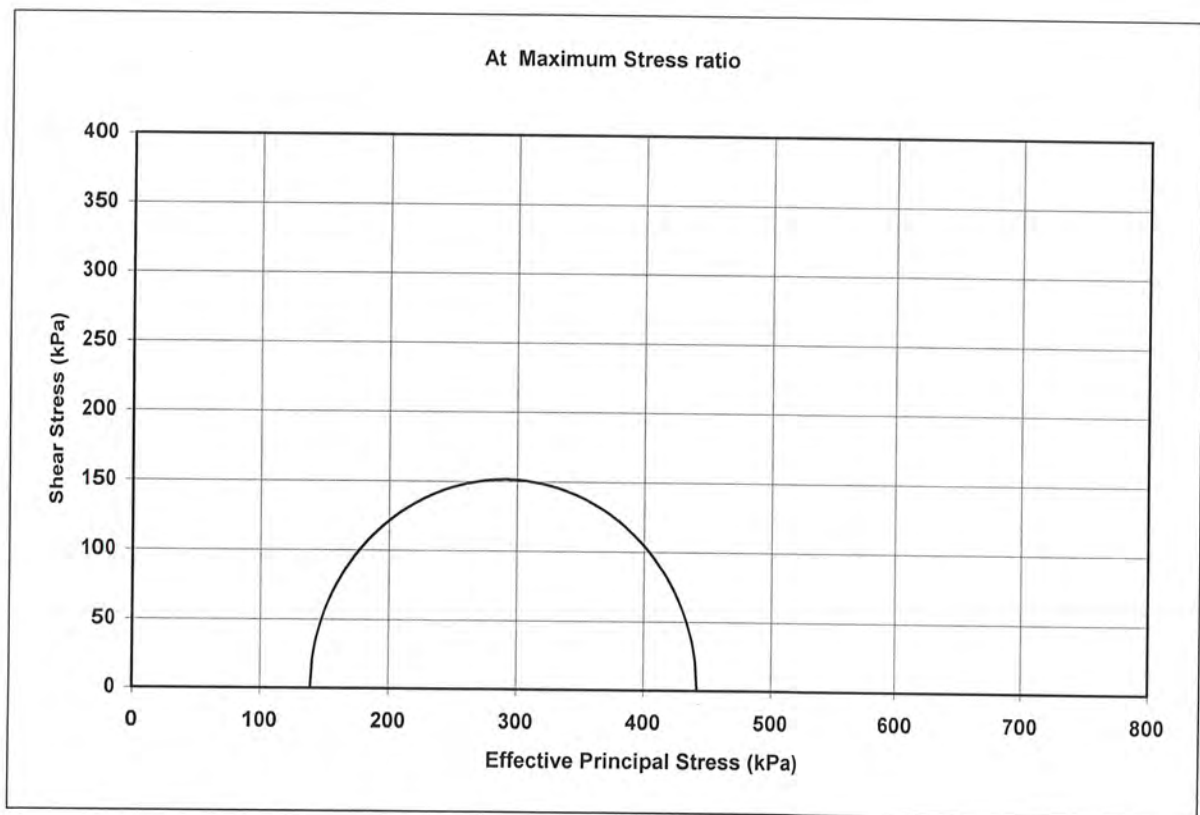
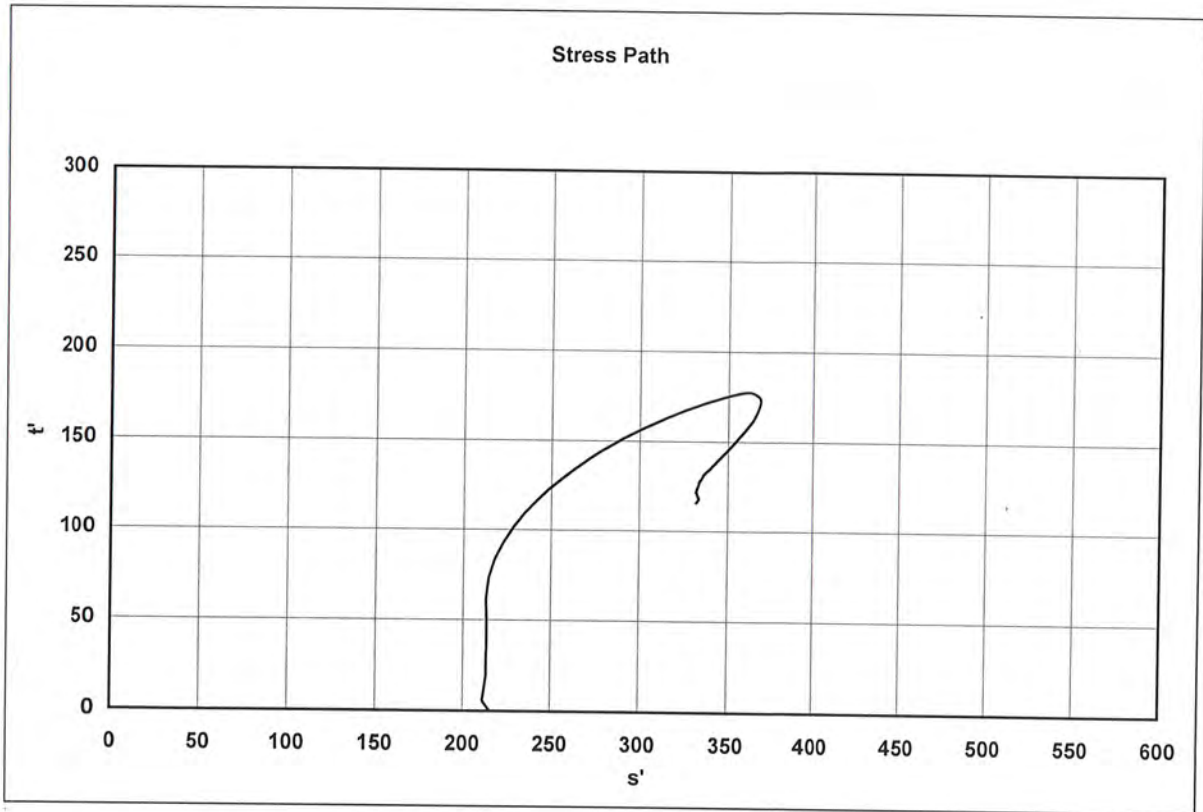
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH07

SAMPLE No : U54

DEPTH (m) : 17.10



# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate,

Pelton Fell, Chester le Street, DH2 2RG.

CONSOLIDATED UNDRAINED TRIAXIAL WITH MEASUREMENT OF PORE WATER PRESSURE

B.S. 1377 : Part 8 : 1990 : Clauses 3,4,5,6 and 7

PROJECT No : 4339

CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH07

SAMPLE No : U63

DEPTH (m) : 19.40

## TEST SPECIMEN PREPARATION

Undisturbed  
Specific Depth (m) : 19.45  
Orientation within original sample : Vertical  
Description : Please refer to sample description sheet.

## TEST SPECIMEN DETAILS

	Stage	1
Length	mm	200.6
Diameter	mm	100.8
Moisture Content	%	18.4
Bulk Density	Mg/m <sup>3</sup>	2.15

## SATURATION STAGE

Drainage Conditions : Both ends and radial boundary  
Final Cell Pressure kPa 550  
Final Pore Pressure kPa 527.7  
Final Pore Pressure Parameter B 0.94  
Duration day(s) 2

## CONSOLIDATION STAGE

Cell Pressure kPa 550  
Back Pressure kPa 300  
Effective Pressure kPa 250  
Final Pore Pressure kPa 305.5  
Duration day(s) 3

## SHEARING STAGE

Cell Pressure kPa 550  
Rate of Axial Displacement mm/min 0.0059  
Final Moisture Content % 17.6  
Final Bulk Density Mg/m<sup>3</sup> 2.13

## CONDITIONS AT FAILURE

	Criterion	Maximum stress ratio
Pore Pressure	kPa	400
Minor Effective Principal Stress	kPa	150
Deviator Stress	kPa	276
Major Effective Principal Stress	kPa	426
Effective Principal Stress Ratio		2.84
Pore Pressure Parameter A		0.34
Axial Strain	%	3.2
Correction applied to Principal Stress	kPa	2.8
Duration	Days	4

PROJECT No : 4339

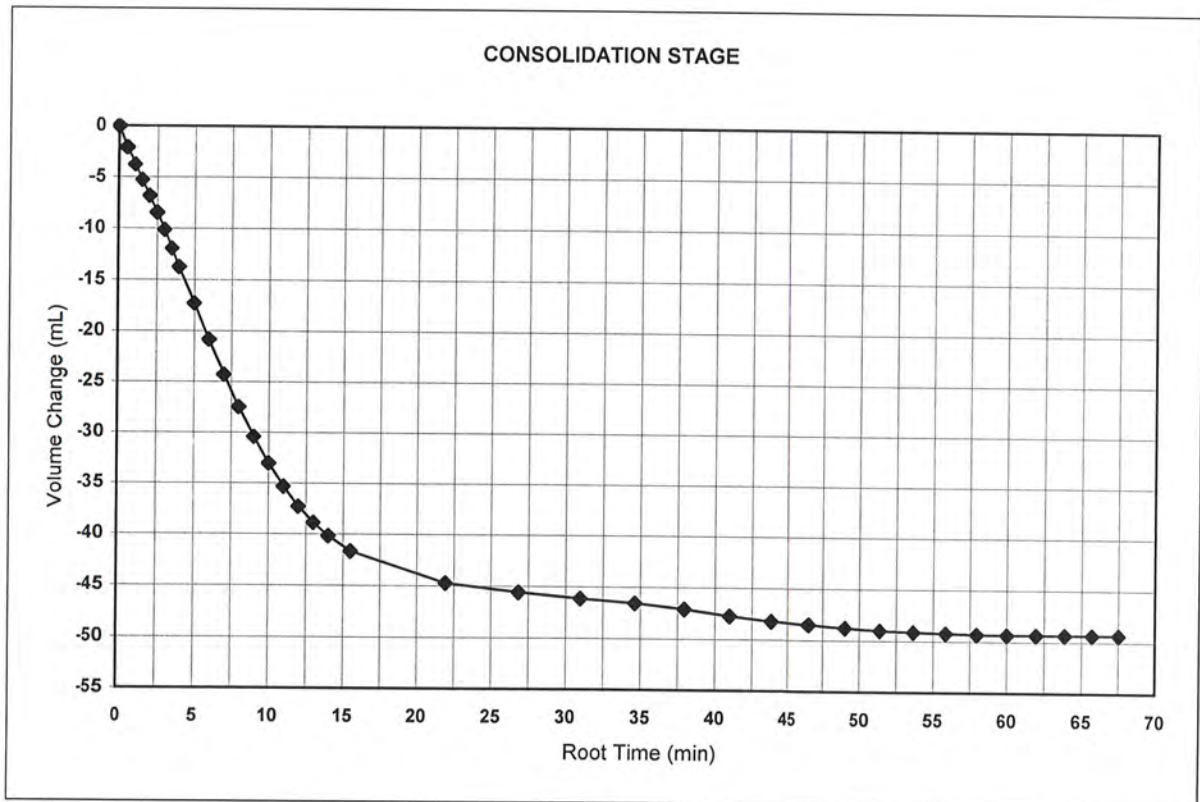
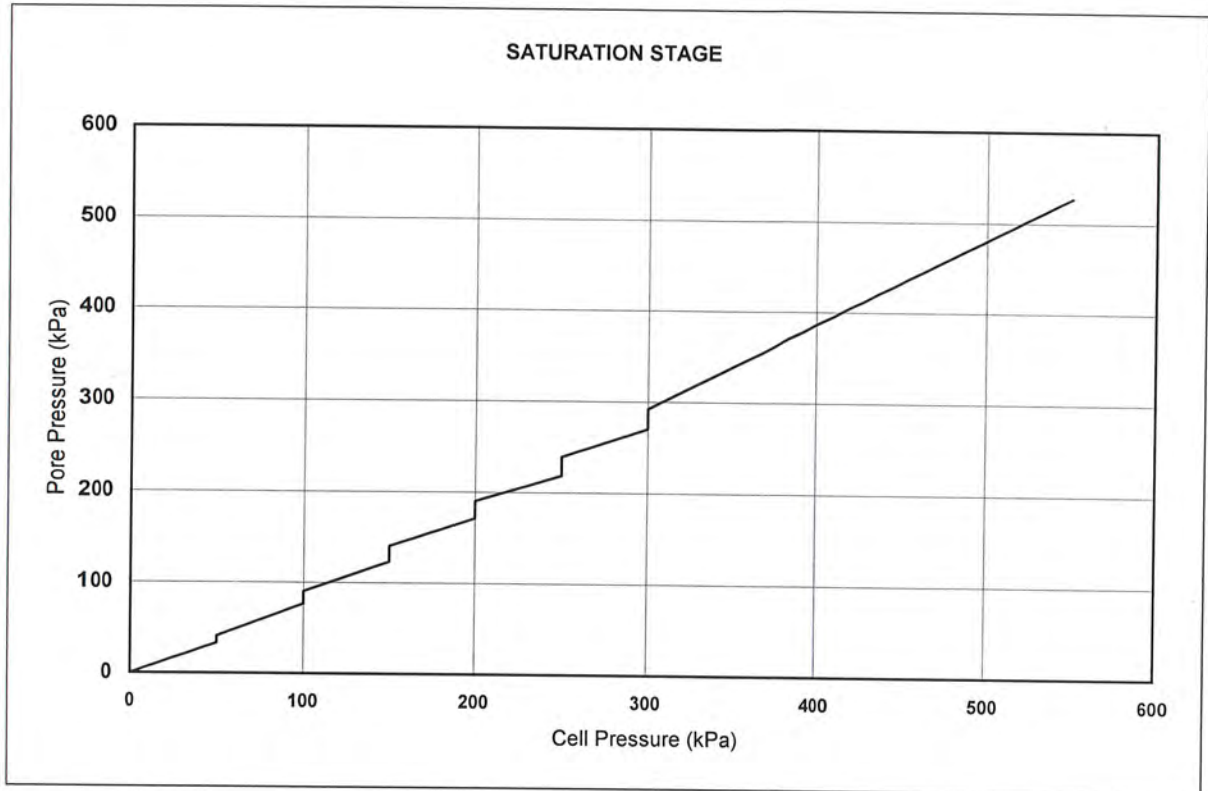
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH07

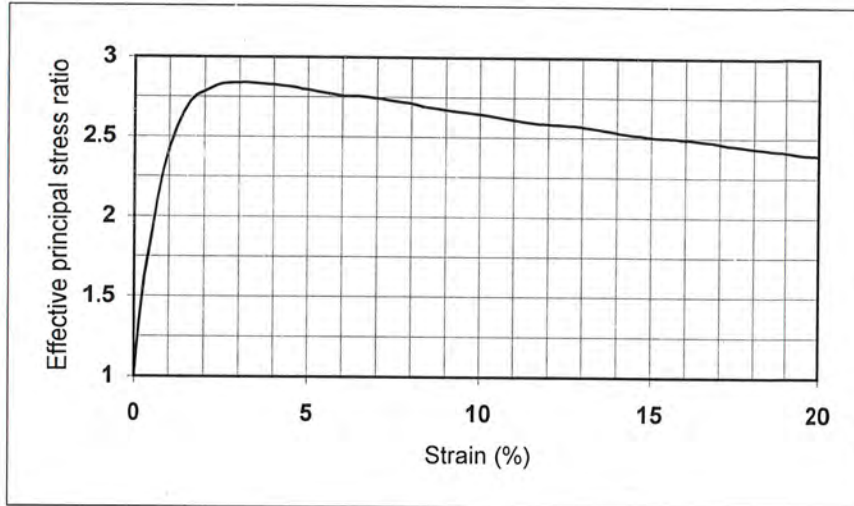
SAMPLE No : U63

DEPTH (m) : 19.40



PROJECT No : 4339      CLIENT : AECOM  
 PROJECT : Preliminary Onshore Ground Investigation for NZT  
 HOLE : MS\BH07      SAMPLE No : U63

DEPTH (m) : 19.40

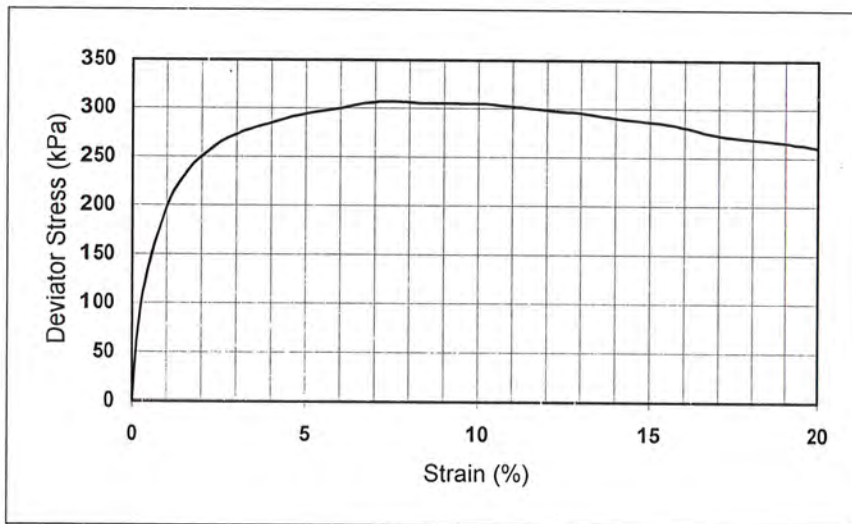


Failure Conditions

Specimen 1

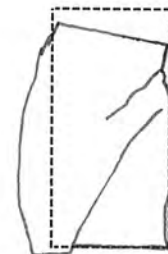
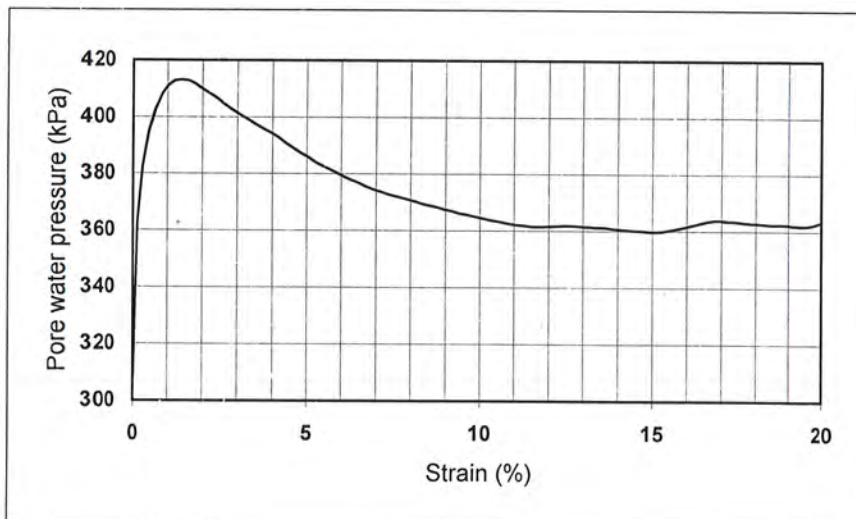
**At maximum stress ratio**

<i>strain</i>	3.18 %
<i>deviator stress</i>	276.2 kPa
<i>stress ratio</i>	2.84



**At maximum deviator stress**

<i>strain</i>	7.13 %
<i>deviator stress</i>	306.9 kPa
<i>stress ratio</i>	2.74



**FAILURE MODE**

PROJECT No : 4339

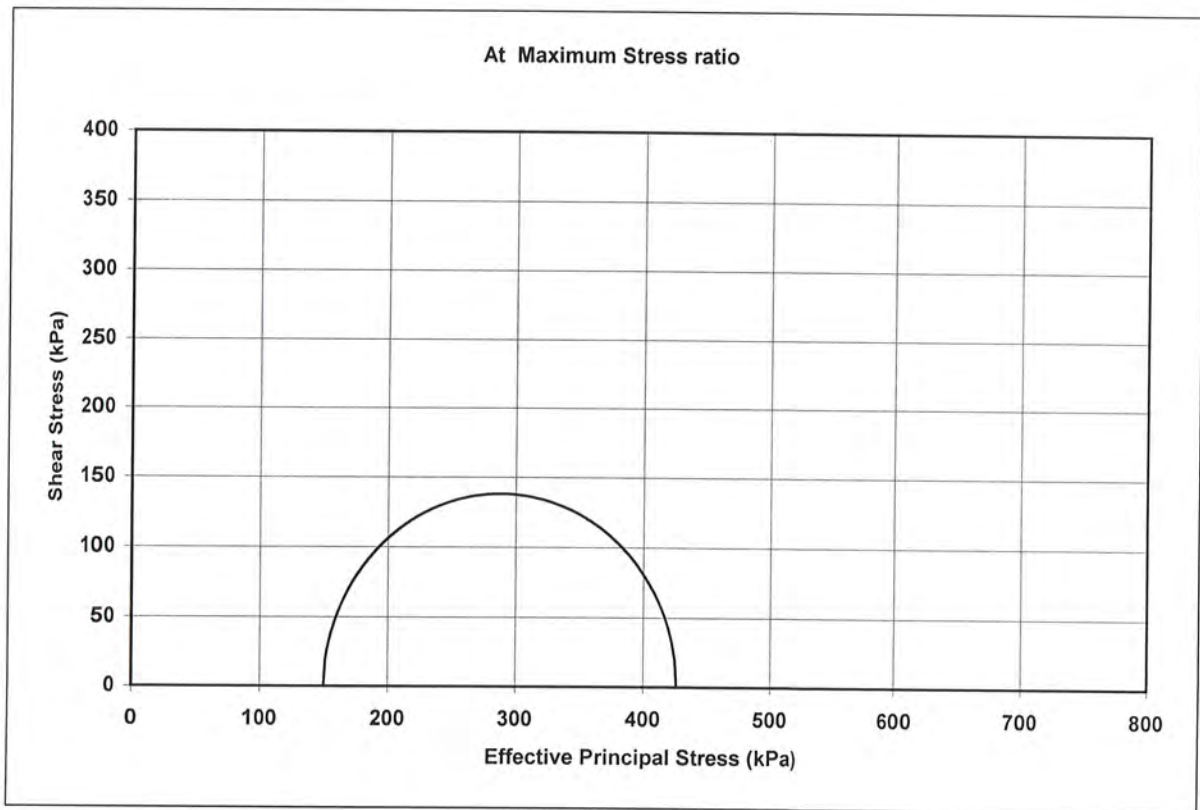
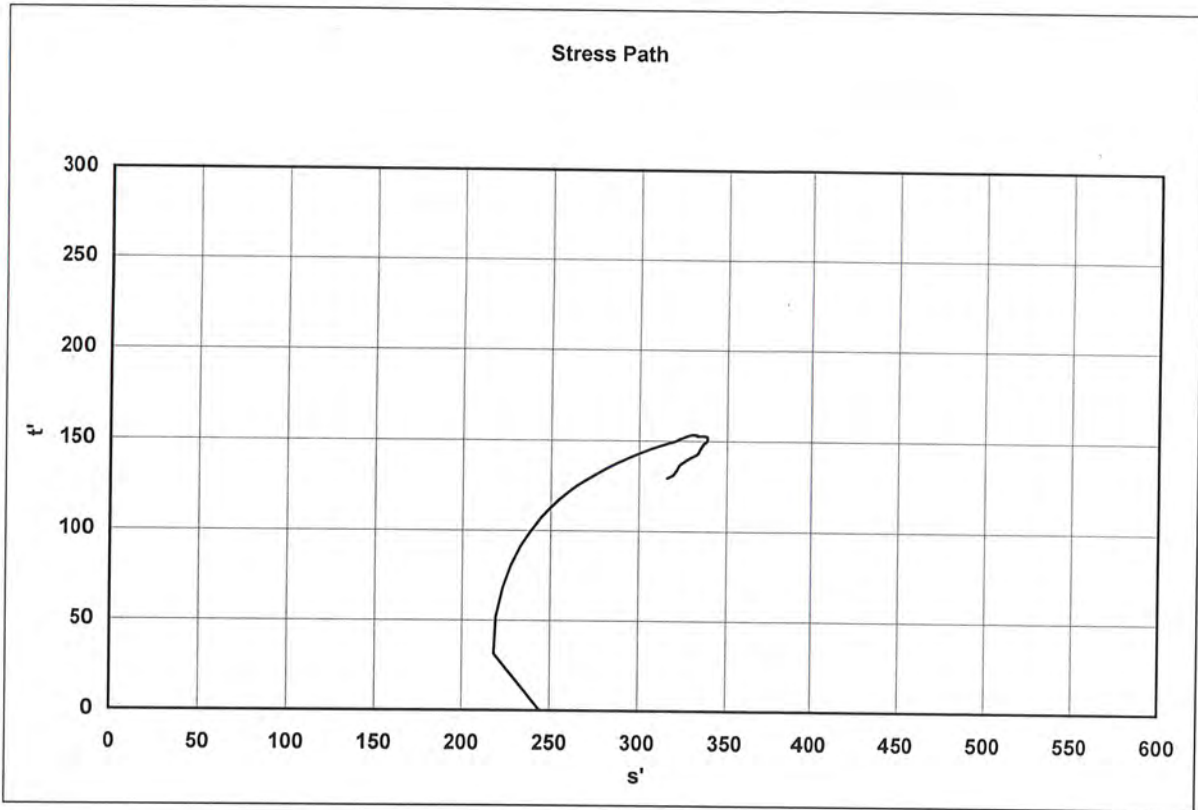
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH07

SAMPLE No : U63

DEPTH (m) : 19.40



# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate,  
Pelton Fell, Chester le Street, DH2 2RG.

CONSOLIDATED UNDRAINED TRIAXIAL WITH MEASUREMENT OF PORE WATER PRESSURE  
B.S. 1377 : Part 8 : 1990 : Clauses 3,4,5,6 and 7

PROJECT No : 4339      CLIENT : AECOM  
PROJECT : Preliminary Onshore Ground Investigation for NZT  
HOLE : MS1BH10      SAMPLE No : U30      DEPTH (m) : 11.70

**TEST SPECIMEN PREPARATION**      Undisturbed  
Specific Depth (m)      : 11.93  
Orientation within original sample      : Vertical  
Description      : Please refer to sample description sheet.

**TEST SPECIMEN DETAILS**      Stage      1  
Length      mm      201.0  
Diameter      mm      102.4  
Moisture Content      %      36.2  
Bulk Density      Mg/m<sup>3</sup>      1.92

**SATURATION STAGE**  
Drainage Conditions      : Both ends and radial boundary  
Final Cell Pressure      kPa      465  
Final Pore Pressure      kPa      454.4  
Final Pore Pressure Parameter B      0.99  
Duration      day(s)      2

**CONSOLIDATION STAGE**  
Cell Pressure      kPa      465  
Back Pressure      kPa      300  
Effective Pressure      kPa      165  
Final Pore Pressure      kPa      302  
Duration      day(s)      3

**SHEARING STAGE**  
Cell Pressure      kPa      465  
Rate of Axial Displacement      mm/min      0.0069  
Final Moisture Content      %      25.8  
Final Bulk Density      Mg/m<sup>3</sup>      1.78

**CONDITIONS AT FAILURE**      Criterion      Maximum stress ratio  
Pore Pressure      kPa      364  
Minor Effective Principal Stress      kPa      101  
Deviator Stress      kPa      173  
Major Effective Principal Stress      kPa      274  
Effective Principal Stress Ratio      2.71  
Pore Pressure Parameter A      0.36  
Axial Strain      %      9.6  
Correction applied to Principal Stress      kPa      5.1  
Duration      Days      4

PROJECT No : 4339

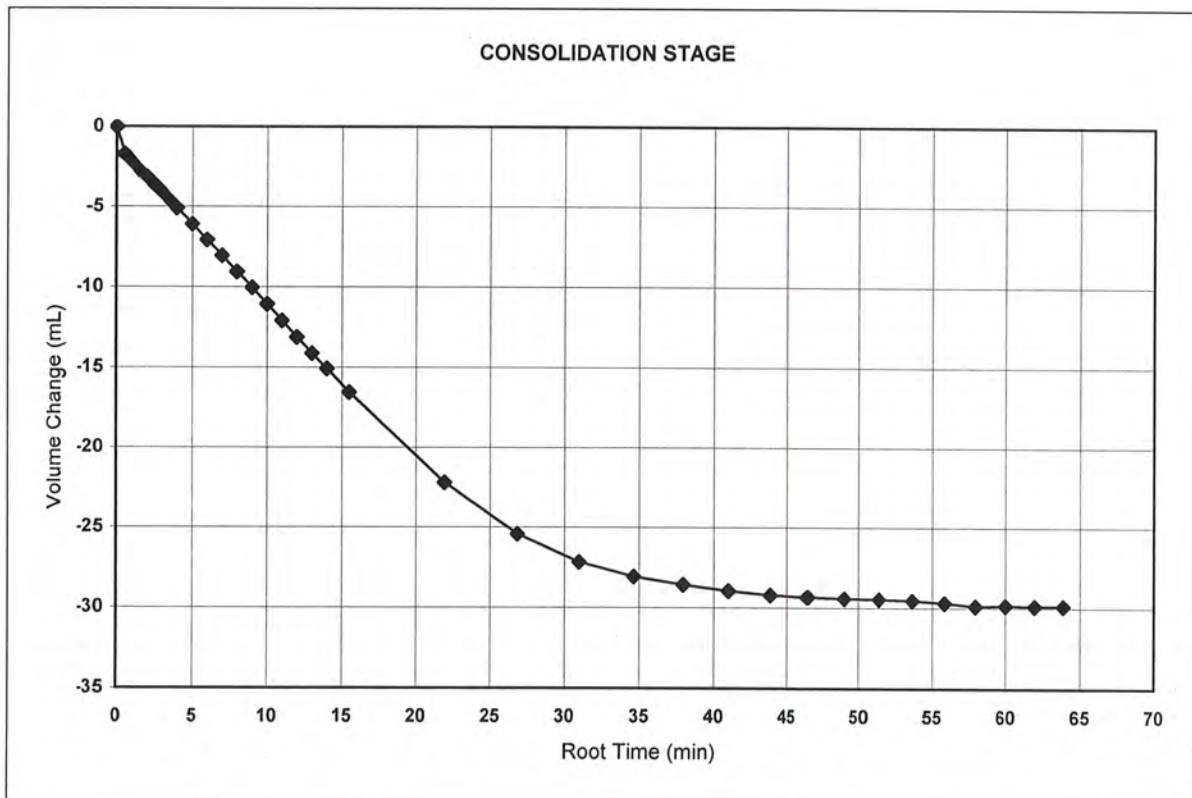
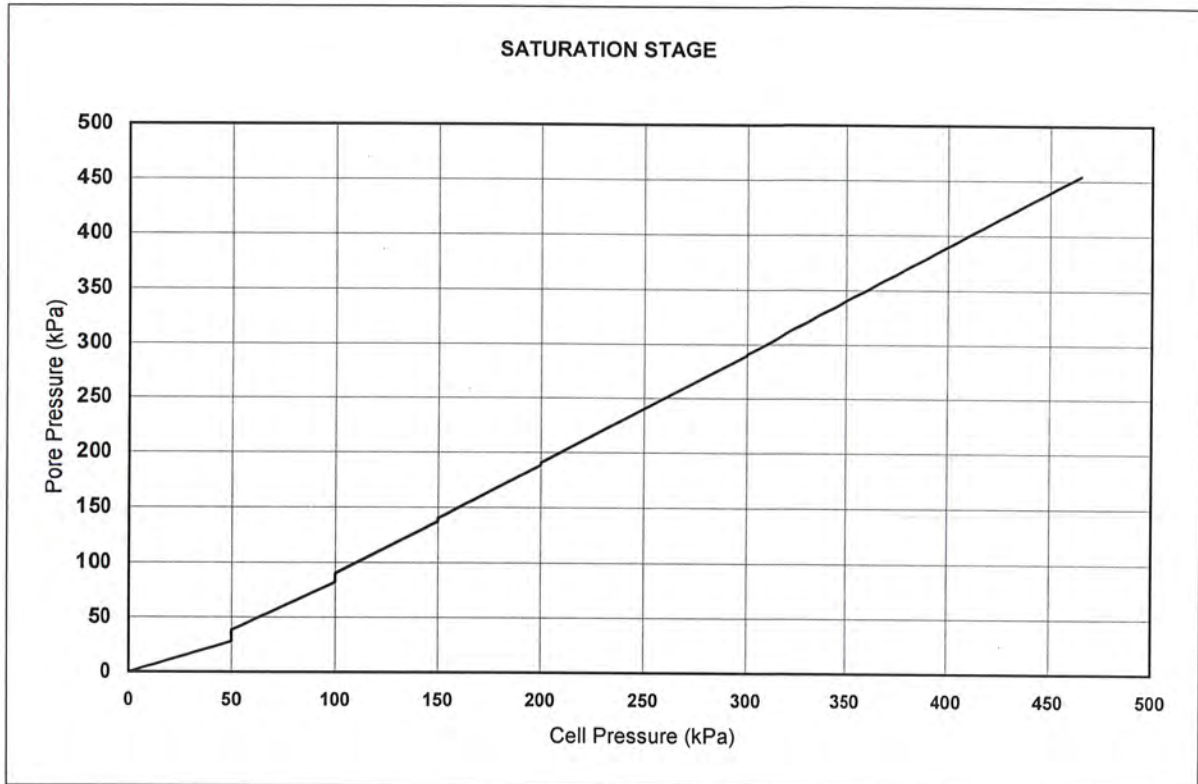
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH10

SAMPLE No : U30

DEPTH (m) : 11.70





PROJECT No : 4339

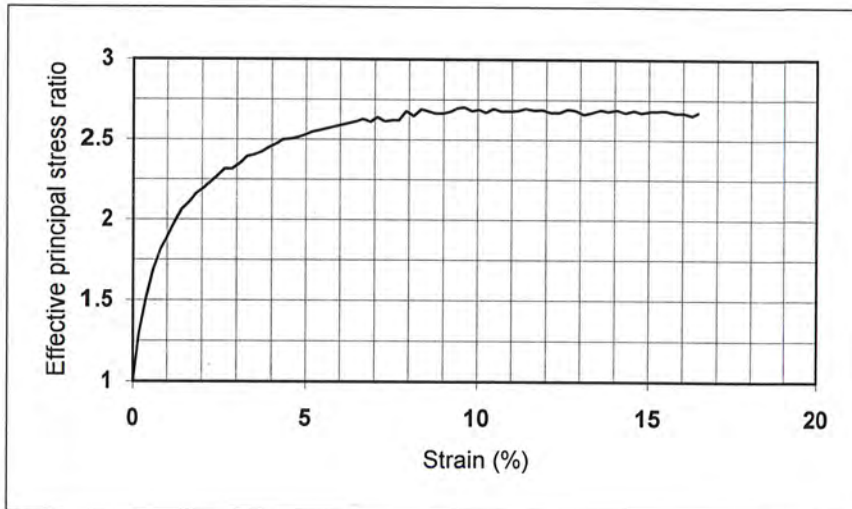
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH10

SAMPLE No : U30

DEPTH (m) : 11.70

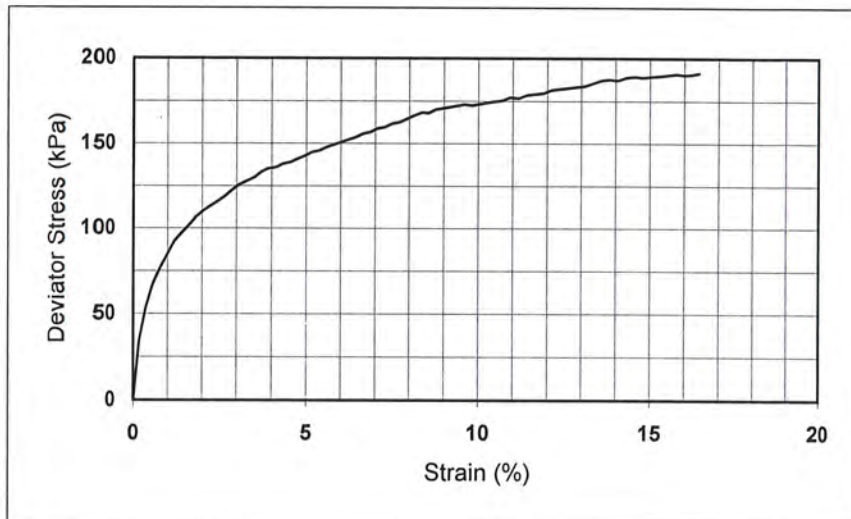


**Failure Conditions**

**Specimen 1**

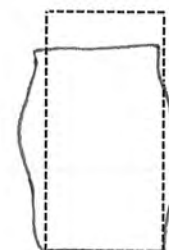
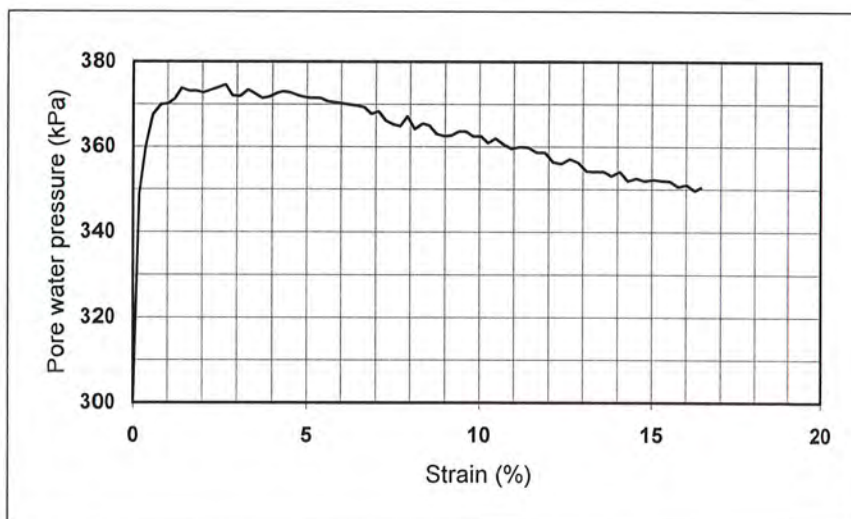
**At maximum stress ratio**

<i>strain</i>	9.61	%
<i>deviator stress</i>	172.9	kPa
<i>stress ratio</i>	2.71	



**At maximum deviator stress**

<i>strain</i>	16.43	%
<i>deviator stress</i>	191.5	kPa
<i>stress ratio</i>	2.67	



**FAILURE MODE**

PROJECT No : 4339

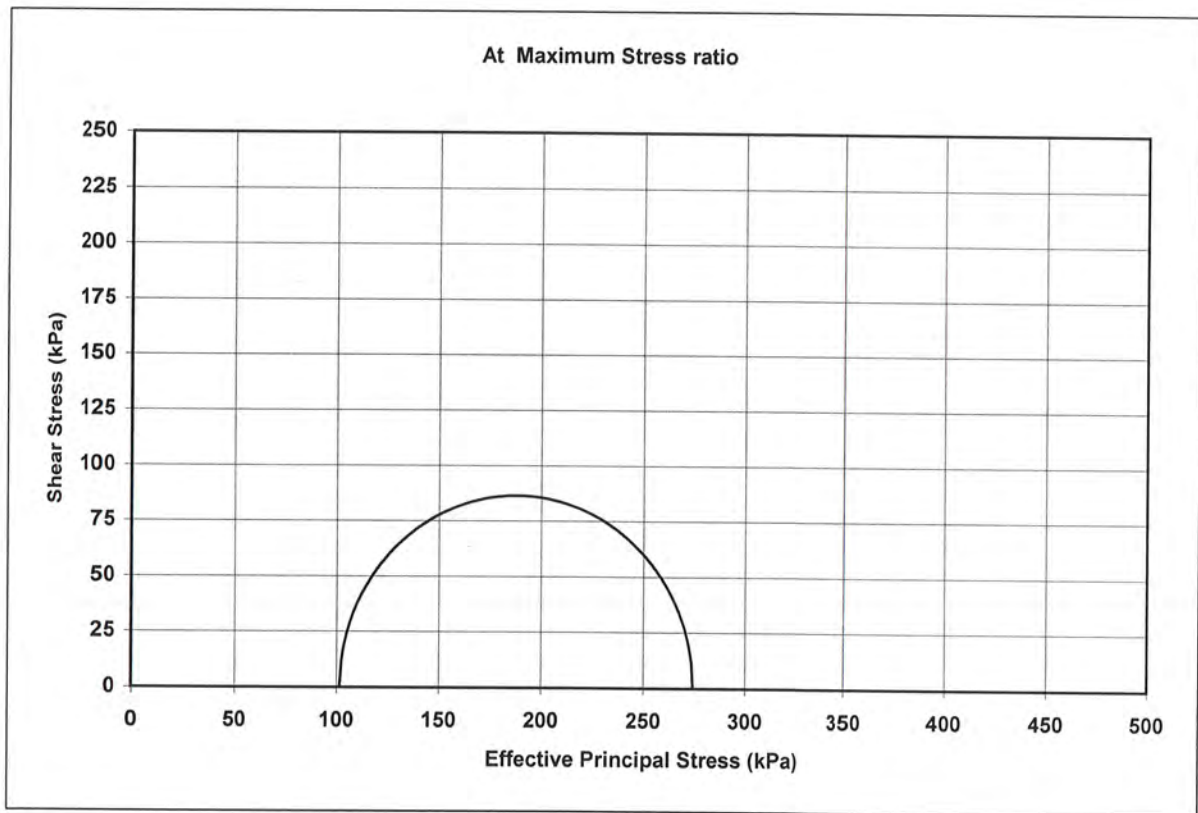
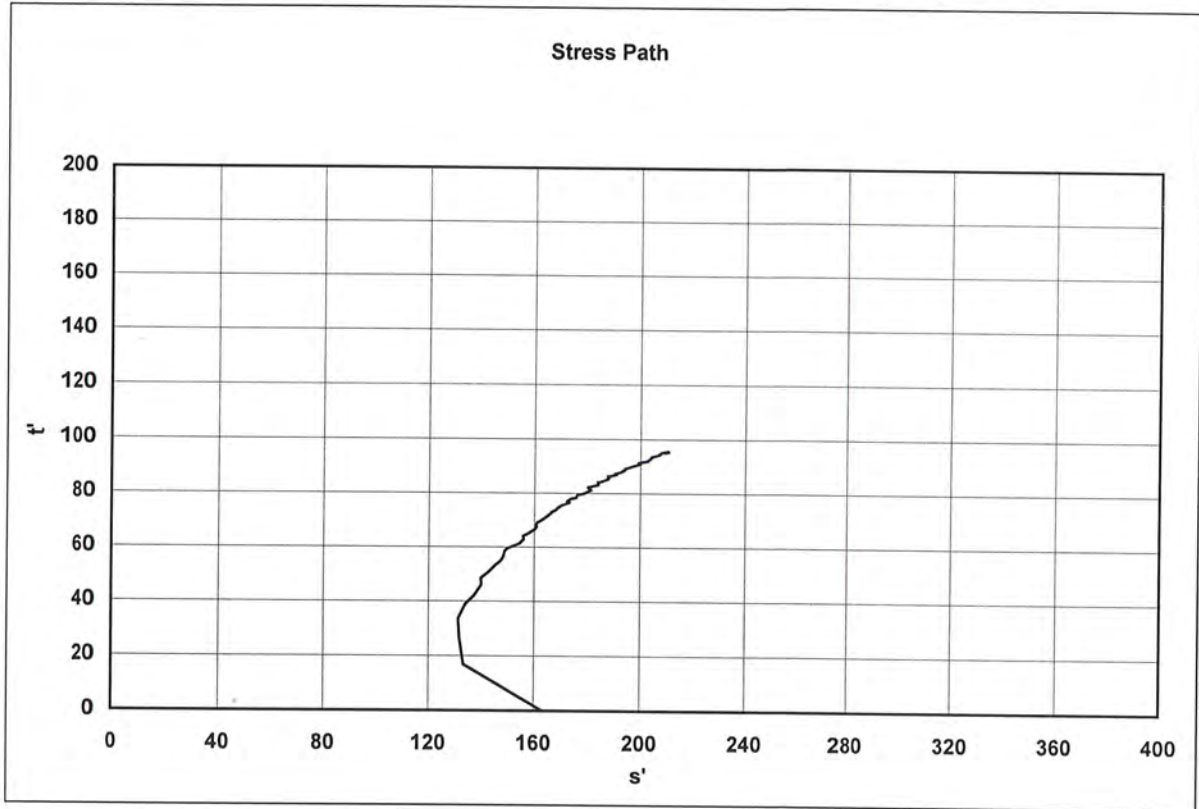
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH10

SAMPLE No : U30

DEPTH (m) : 11.70



# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate,  
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CONSOLIDATED UNDRAINED TRIAXIAL WITH MEASUREMENT OF PORE WATER PRESSURE  
B.S. 1377 : Part 8 : 1990 : Clauses 3,4,5,6 and 7

PROJECT No : 4339

CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH10

SAMPLE No : U38

DEPTH (m) : 15.10

## TEST SPECIMEN PREPARATION

Undisturbed  
Specific Depth (m) : 15.22  
Orientation within original sample : Vertical  
Description : Please refer to sample description sheet.

## TEST SPECIMEN DETAILS

	Stage	1
Length	mm	200.7
Diameter	mm	100.9
Moisture Content	%	24.9
Bulk Density	Mg/m <sup>3</sup>	2.05

## SATURATION STAGE

Drainage Conditions : Both ends and radial boundary  
Final Cell Pressure kPa 500  
Final Pore Pressure kPa 485.3  
Final Pore Pressure Parameter B 0.97  
Duration day(s) 2

## CONSOLIDATION STAGE

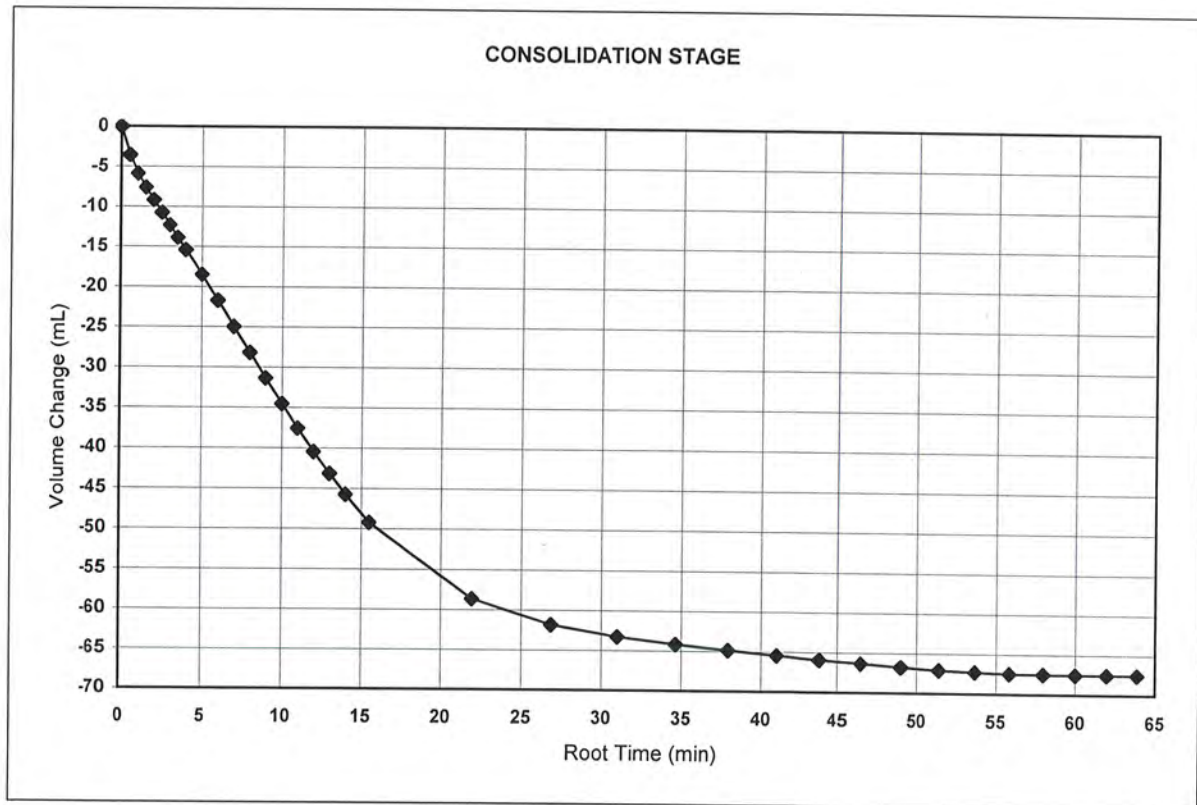
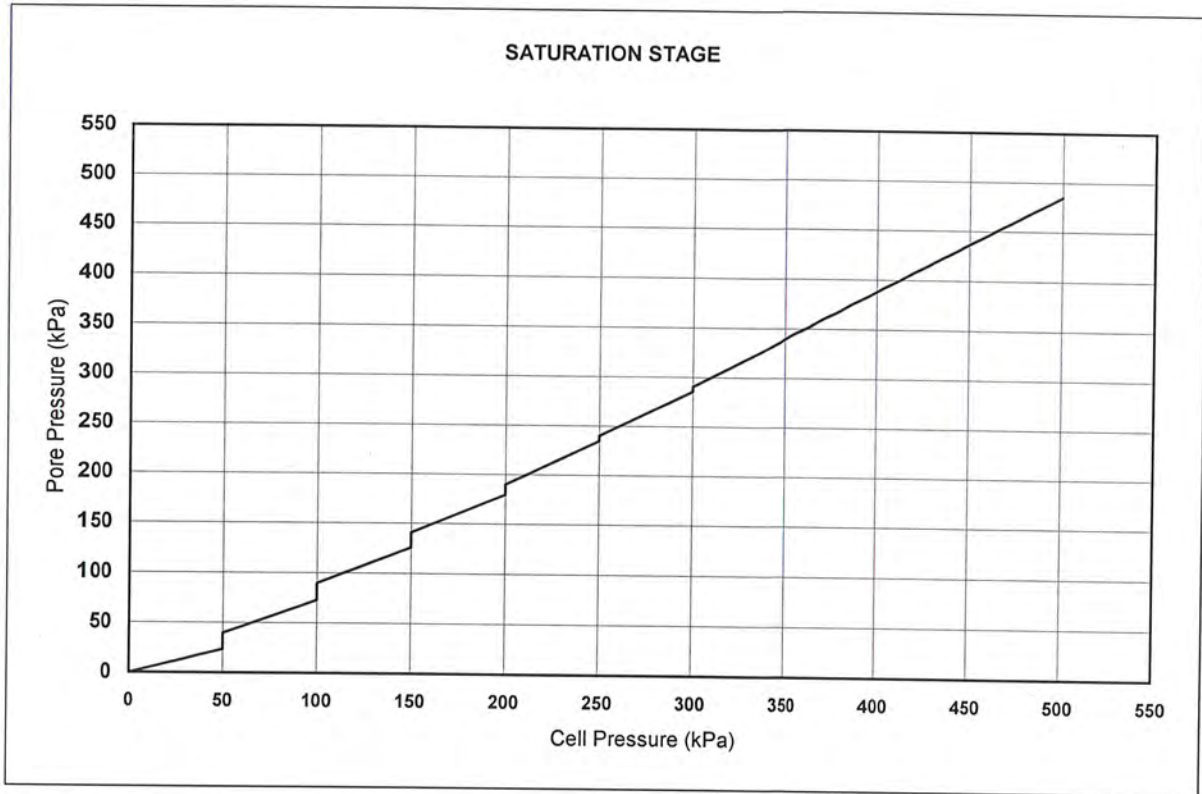
Cell Pressure kPa 500  
Back Pressure kPa 300  
Effective Pressure kPa 200  
Final Pore Pressure kPa 299.1  
Duration day(s) 3

## SHEARING STAGE

Cell Pressure kPa 500  
Rate of Axial Displacement mm/min 0.00916  
Final Moisture Content % 23.5  
Final Bulk Density Mg/m<sup>3</sup> 2.03

## CONDITIONS AT FAILURE

	Criterion	Maximum stress ratio
Pore Pressure	kPa	373
Minor Effective Principal Stress	kPa	127
Deviator Stress	kPa	223
Major Effective Principal Stress	kPa	350
Effective Principal Stress Ratio		2.75
Pore Pressure Parameter A		0.33
Axial Strain	%	5.8
Correction applied to Principal Stress	kPa	4.5
Duration	Days	3



PROJECT No : 4339

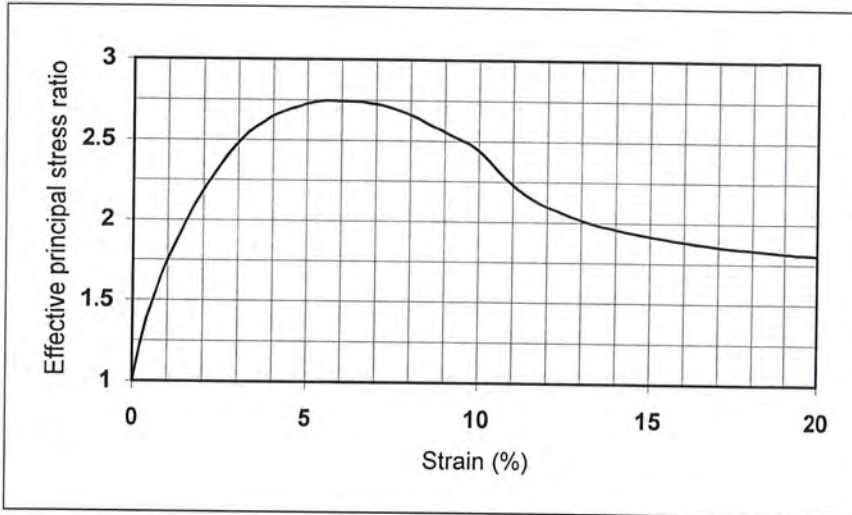
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH10

SAMPLE No : U38

DEPTH (m) : 15.10

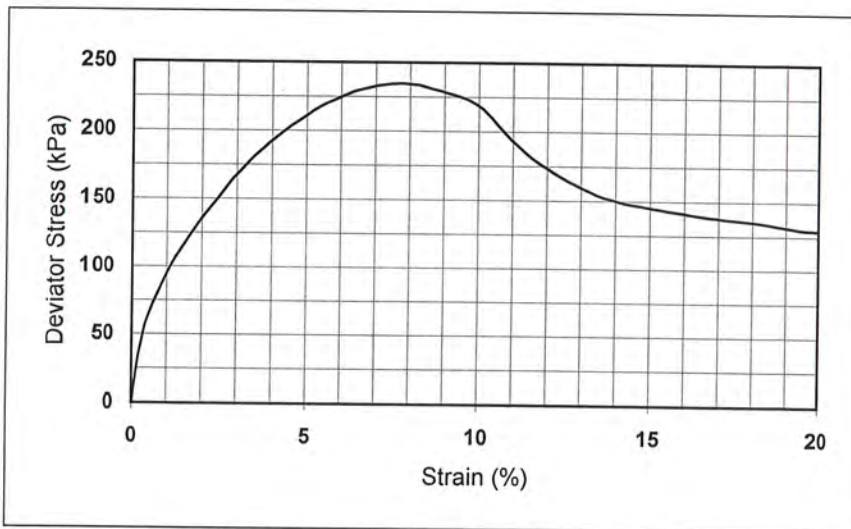


**Failure Conditions**

**Specimen 1**

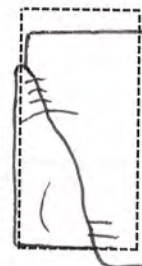
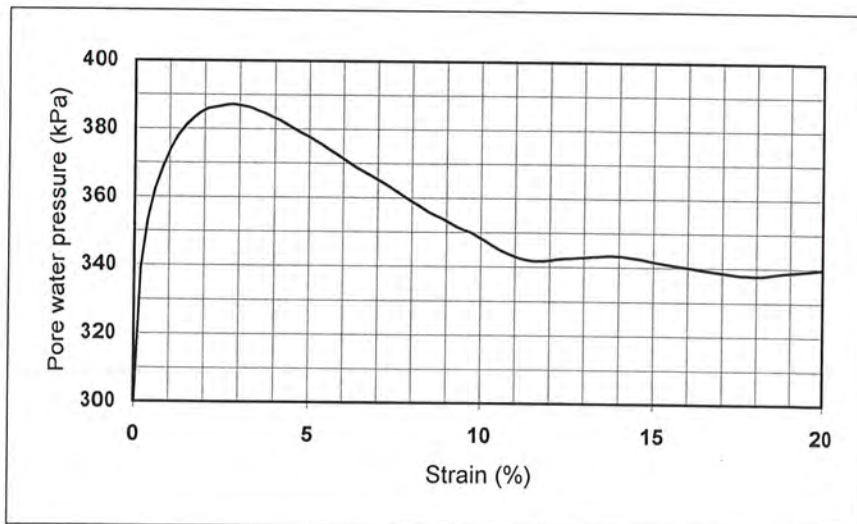
At maximum stress ratio

strain	5.78 %
deviator stress	222.8 kPa
stress ratio	2.75



At maximum deviator stress

strain	7.65 %
deviator stress	234.6 kPa
stress ratio	2.69



**FAILURE MODE**

PROJECT No : 4339

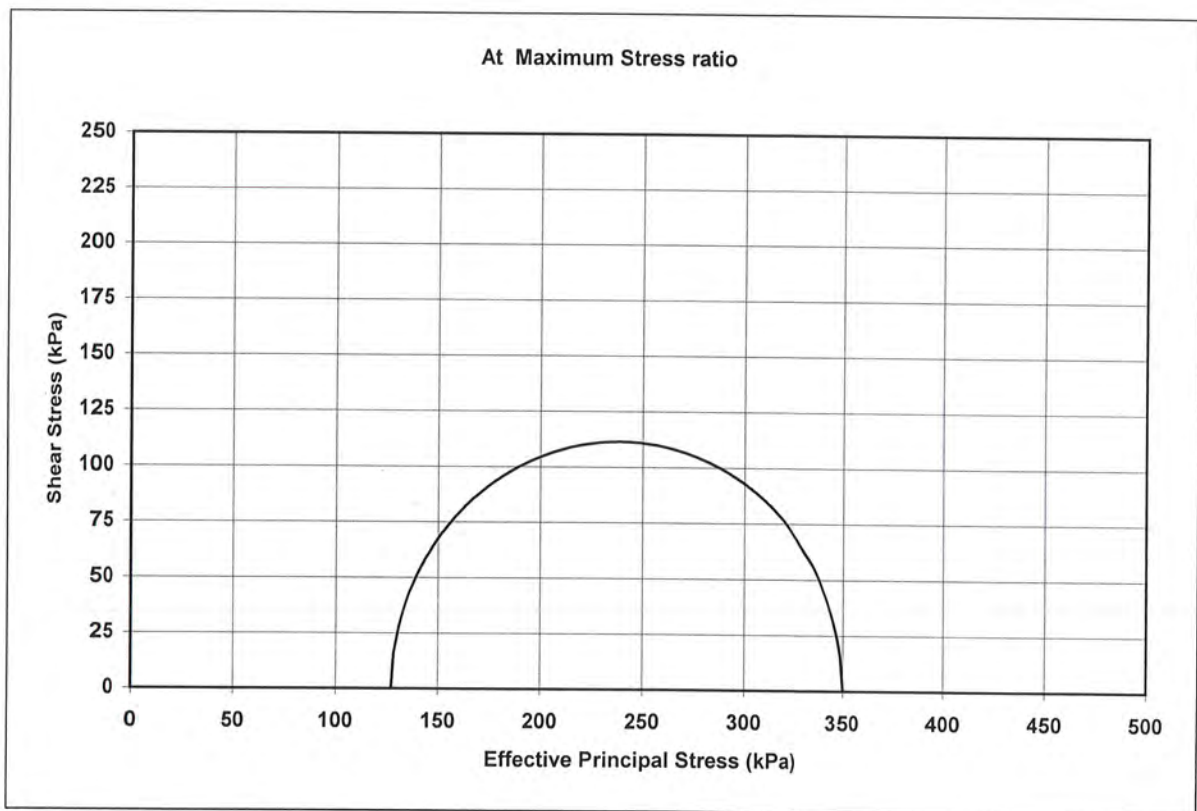
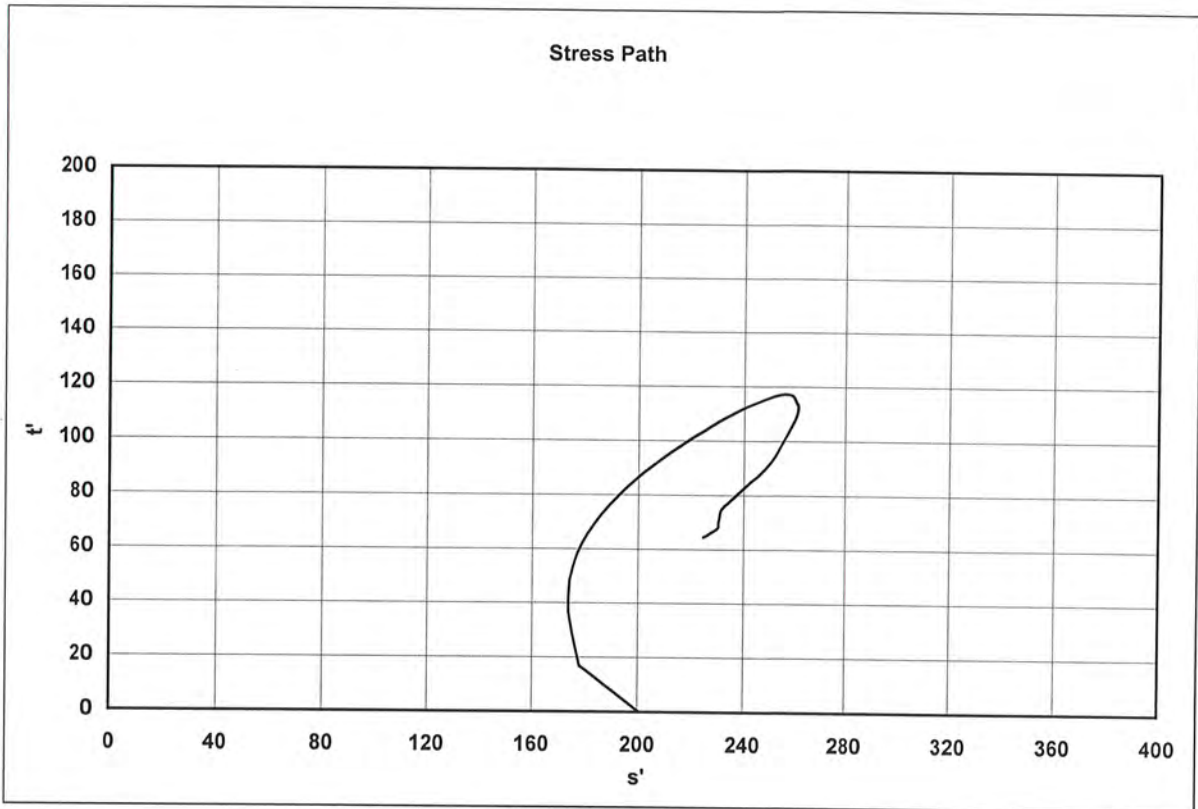
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH10

SAMPLE No : U38

DEPTH (m) : 15.10



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B.S. 1377 : Part 8 : 1990 : Clauses 3,4,5,6 and 7

PROJECT No : 4339

CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH11

SAMPLE No : U51

DEPTH (m) : 15.90

## TEST SPECIMEN PREPARATION

Undisturbed  
Specific Depth (m) : 15.91  
Orientation within original sample : Vertical  
Description : Please refer to sample description sheet.

## TEST SPECIMEN DETAILS

	Stage	1
Length	mm	200.5
Diameter	mm	102.4
Moisture Content	%	20.6
Bulk Density	Mg/m <sup>3</sup>	2.10

## SATURATION STAGE

Drainage Conditions : Both ends and radial boundary  
Final Cell Pressure kPa 460  
Final Pore Pressure kPa 446.4  
Final Pore Pressure Parameter B 0.98  
Duration day(s) 2

## CONSOLIDATION STAGE

Cell Pressure kPa 460  
Back Pressure kPa 300  
Effective Pressure kPa 160  
Final Pore Pressure kPa 301  
Duration day(s) 3

## SHEARING STAGE

Cell Pressure kPa 460  
Rate of Axial Displacement mm/min 0.00918  
Final Moisture Content % 20.4  
Final Bulk Density Mg/m<sup>3</sup> 2.10

## CONDITIONS AT FAILURE

	Criterion	Maximum stress ratio
Pore Pressure	kPa	352
Minor Effective Principal Stress	kPa	108
Deviator Stress	kPa	236
Major Effective Principal Stress	kPa	344
Effective Principal Stress Ratio		3.17
Pore Pressure Parameter A		0.21
Axial Strain	%	4.7
Correction applied to Principal Stress	kPa	4.1
Duration	Days	3

PROJECT No : 4339

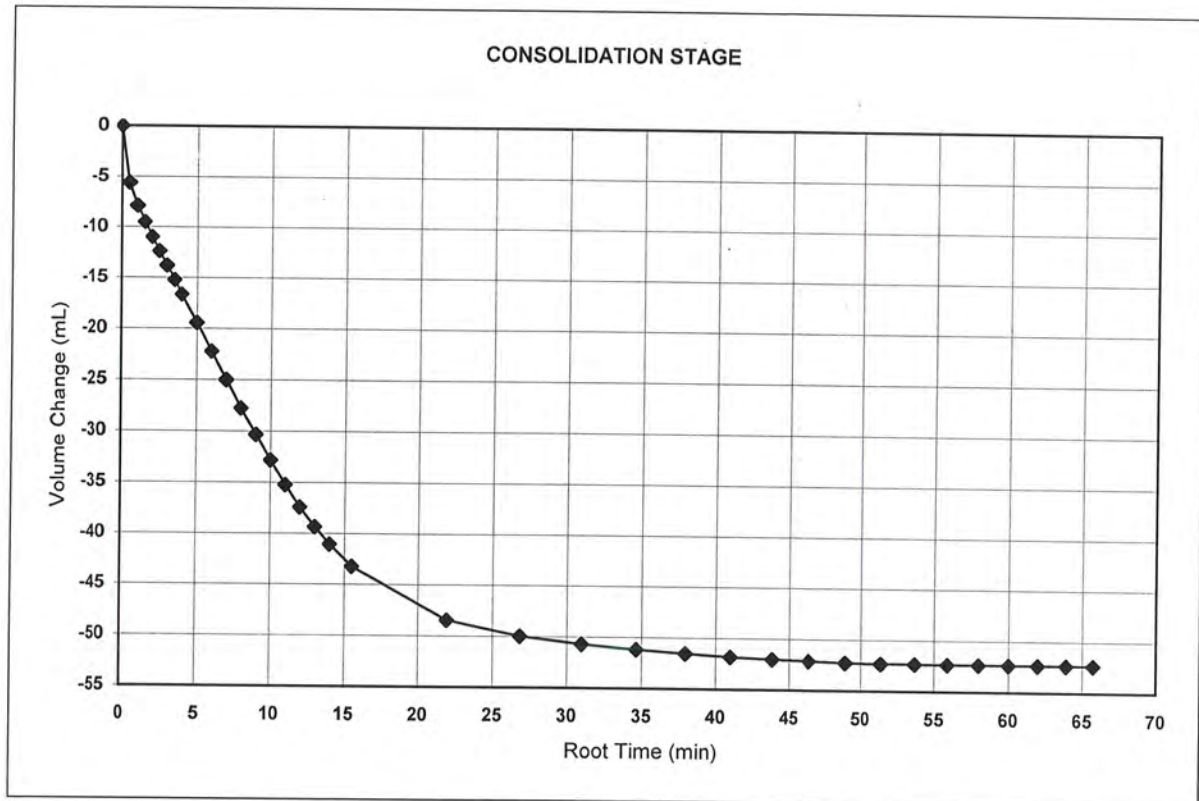
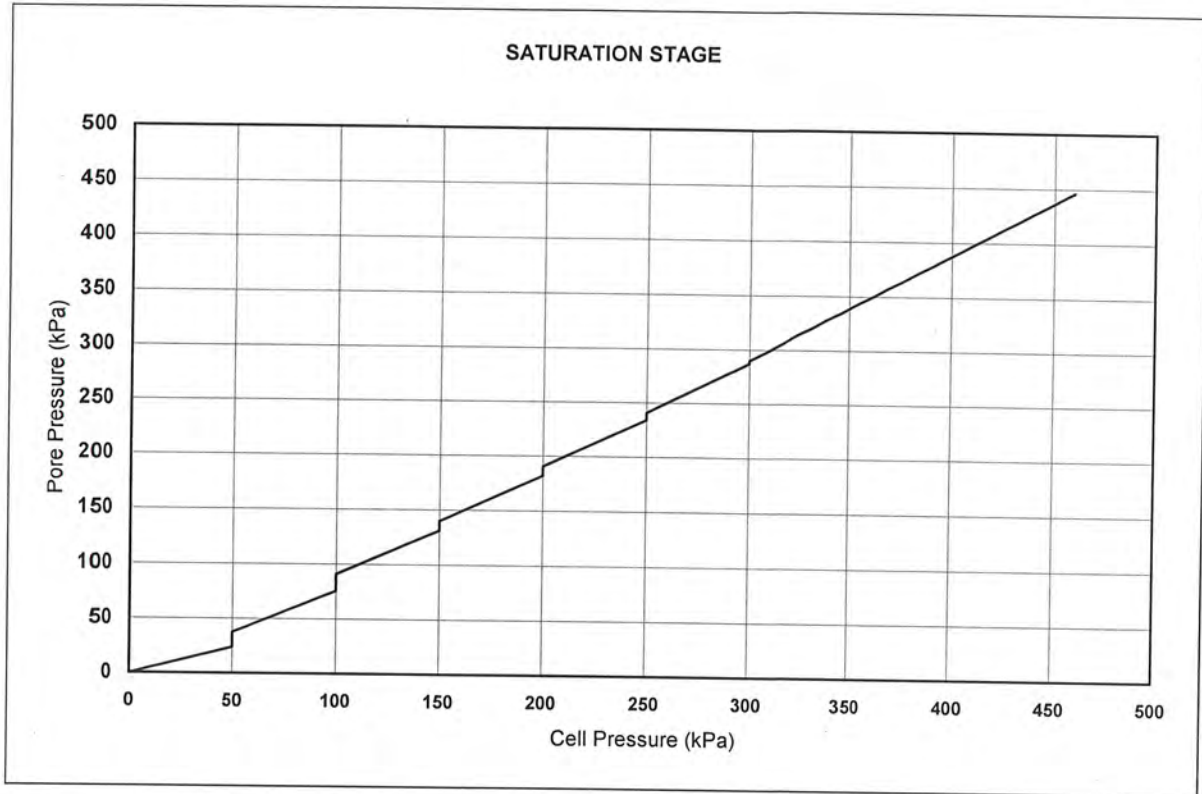
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH11

SAMPLE No : U51

DEPTH (m) : 15.90





PROJECT No : 4339

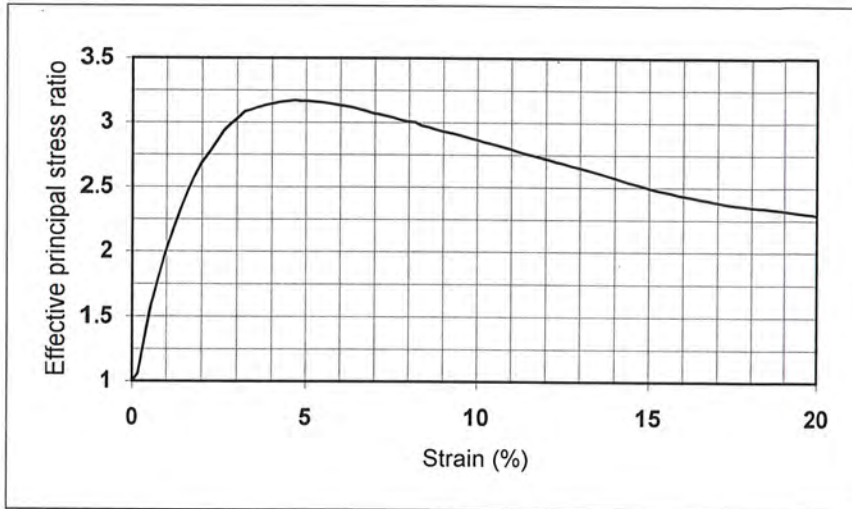
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH11

SAMPLE No : U51

DEPTH (m) : 15.90

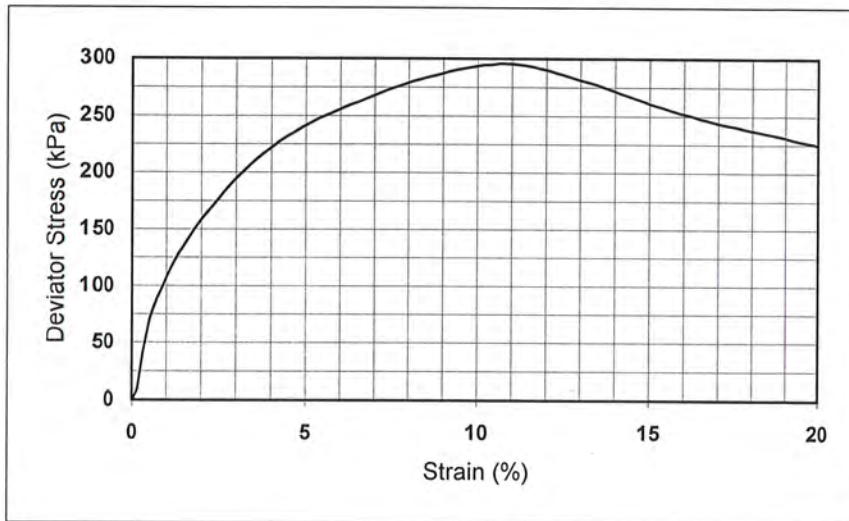


**Failure Conditions**

**Specimen 1**

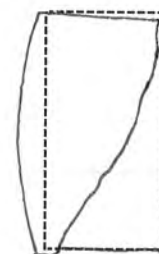
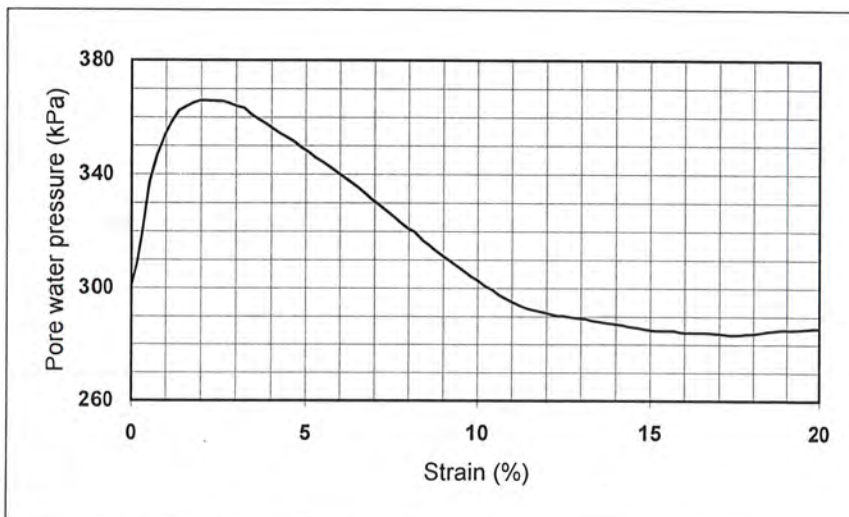
**At maximum stress ratio**

<i>strain</i>	4.66 %
<i>deviator stress</i>	235.5 kPa
<i>stress ratio</i>	3.17



**At maximum deviator stress**

<i>strain</i>	10.63 %
<i>deviator stress</i>	295.7 kPa
<i>stress ratio</i>	2.82



**FAILURE MODE**

PROJECT No : 4339

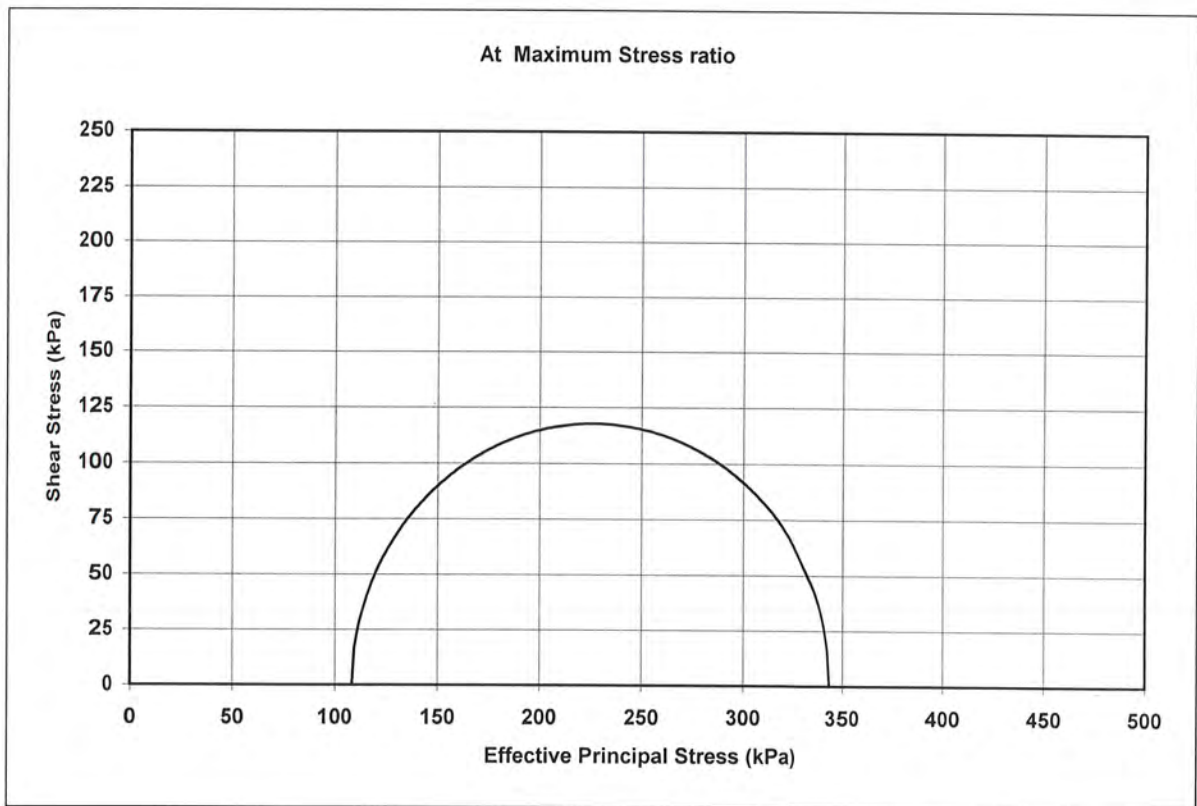
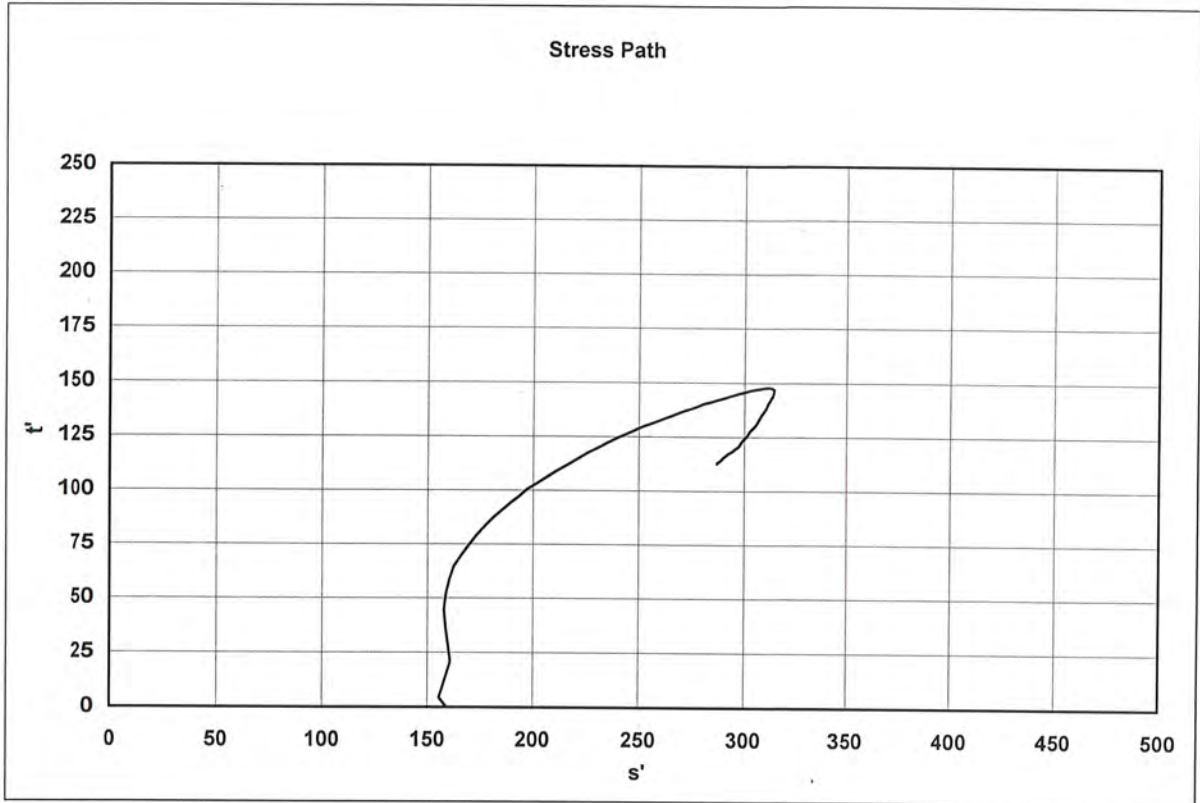
CLIENT : AECOM

PROJECT : Preliminary Onshore Ground Investigation for NZT

HOLE : MS\BH11

SAMPLE No : U51

DEPTH (m) : 15.90



## Determination of Point Load Index

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
LF1BH01	25.70	Diametral/Unknown	160.4	84.2	1.2	7091.3	0.16	1.26	0.205	Mudstone #	23/08/2021
LF1BH01	25.70	Axial/Unknown	84.5	57.4	2.6	6182.8	0.43	1.23	0.523	Mudstone #	23/08/2021
LF1BH01	29.50	Diametral/Unknown	241.4	97.5	2.6	9512.1	0.27	1.35	0.367	Mudstone #	23/08/2021
LF1BH01	29.50	Axial/Unknown	99.6	58.8	3.7	7455.2	0.49	1.28	0.632	Mudstone #	23/08/2021
LF1BH01	29.90	Diametral/Unknown	221.1	97.9	4.2	9580.5	0.43	1.35	0.588	Mudstone	23/08/2021
LF1BH01	29.90	Axial/Unknown	100.1	54.3	4.4	6919.8	0.64	1.26	0.801	Mudstone	23/08/2021
LF1BH01	31.40	Diametral/Unknown	267.1	95.0	3.8	9023.1	0.42	1.33	0.56	Mudstone #	23/08/2021
LF1BH01	31.40	Axial/Unknown	100.1	44.8	1.7	5704.6	0.29	1.2	0.35	Mudstone #	23/08/2021
LF1BH01	32.70	Diametral/Unknown	128.2	82.7	1.3	6844.3	0.19	1.25	0.242	Mudstone	23/08/2021
LF1BH01	32.70	Axial/Unknown	82.8	47.5	4.1	5006.2	0.83	1.17	0.966	Mudstone	23/08/2021
LF1BH01	35.20	Diametral/Unknown	130.1	80.8	2.4	6533.5	0.37	1.24	0.455	Mudstone	23/08/2021
LF1BH01	35.20	Axial/Unknown	81.7	36.0	5.3	3741.0	1.41	1.09	1.547	Mudstone	23/08/2021
LF1BH01	38.40	Diametral/Unknown	123.0	82.9	0.4	6869.1	0.06	1.26	0.077	Mudstone #	23/08/2021
LF1BH01	38.40	Axial/Unknown	83.8	29.7	3.5	3161.7	1.11	1.05	1.166	Mudstone	23/08/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # -Invalid Failure (Did not pass through both points) !-Too soft to register a reading

Date of issue :- 31/08/2021	Certificate No :- PL/4339/1	Signed :- [Redacted]	Name :- [Redacted]
Client :- AECOM	Contract Title :- Preliminary Onshore Ground Investigation for NZT		Page 1 of 10 AEG Contract No :- 4339
			

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG. - Tel: 0191 387 4700 Fax: 0191 387 4710  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL. - Tel: 01772 735 300 Fax: 01772 735 999

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
LF1BH02	29.30	Diametral/Unknown	179.0	84.2	2.0	7089.6	0.28	1.26	0.354	Mudstone #	23/08/2021
LF1BH02	29.30	Axial/Unknown	89.0	48.6	7.0	5502.6	1.28	1.19	1.527	Mudstone	23/08/2021
LF1BH02	30.45	Diametral/Unknown	139.8	99.4	0.8	9874.4	0.08	1.36	0.111	Mudstone #	23/08/2021
LF1BH02	30.45	Axial/Unknown	99.4	58.4	3.1	7384.0	0.42	1.28	0.537	Mudstone	23/08/2021
LF1BH02	32.70	Diametral/Unknown	130.2	99.3	1.6	9850.6	0.16	1.36	0.221	Mudstone	23/08/2021
LF1BH02	32.70	Axial/Unknown	100.0	45.7	2.4	5819.3	0.41	1.21	0.494	Mudstone	23/08/2021
LF1BH02	33.70	Diametral/Unknown	132.1	94.9	1.3	9006.0	0.14	1.33	0.192	Mudstone #	23/08/2021
LF1BH02	33.70	Axial/Unknown	98.9	38.3	2.7	4824.9	0.57	1.16	0.661	Mudstone	23/08/2021
LF1BH02	34.00	Diametral/Unknown	133.2	97.0	1.2	9412.9	0.13	1.35	0.177	Mudstone	23/08/2021
LF1BH02	34.00	Axial/Unknown	97.2	38.3	3.3	4741.2	0.69	1.15	0.802	Mudstone	23/08/2021
LF1BH02	34.60	Diametral/Unknown	140.0	98.7	1.1	9745.6	0.11	1.36	0.156	Mudstone	23/08/2021
LF1BH02	34.60	Axial/Unknown	99.7	48.7	4.9	6185.9	0.79	1.23	0.97	Mudstone	23/08/2021
LF1BH02	35.10	Diametral/Unknown	159.7	92.2	0.1	8497.2	0.02	1.32	0.022	Mudstone	23/08/2021
LF1BH02	35.10	Axial/Unknown	96.5	46.1	0.4	5661.6	0.08	1.2	0.094	Mudstone #	23/08/2021

NOTES - + Tested specimen measured using calibrated vernier calipers #-Invalid Failure (Did not pass through both points) !-Too soft to register a reading

Date of issue :- 31/08/2021	Certificate No :- PL/4339/2	Signed :- 	Name :- <b>M. SEKHAR</b>
Client :- AECOM	Contract Title :- Preliminary Onshore Ground Investigation for NZT		
Page 2 of 10		AEG Contract No :- 4339	

# ALLIED EXPLORATION & GEOTECHNICS LIMITED


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## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
LF1BH02	35.60	Diametral/Unknown	140.9	94.9	0.5	9006.0	0.06	1.33	0.081	Mudstone #	23/08/2021
LF1BH02	35.60	Axial/Unknown	97.1	45.2	1.4	5583.4	0.25	1.2	0.295	Mudstone	23/08/2021
LF1BH02	36.90	Diametral/Unknown	143.0	99.0	0.3	9805.0	0.03	1.36	0.044	Mudstone	23/08/2021
LF1BH02	36.90	Axial/Unknown	99.6	57.8	0.5	7326.4	0.07	1.27	0.087	Mudstone	23/08/2021
LF1BH02	37.20	Diametral/Unknown	132.4	97.5	0.2	9502.4	0.03	1.35	0.034	Mudstone	23/08/2021
LF1BH02	37.20	Axial/Unknown	99.2	43.3	0.7	5466.1	0.13	1.19	0.158	Mudstone #	23/08/2021
MS1BH02	25.90	Diametral/Unknown	130.6	94.4	0.4	8911.4	0.04	1.33	0.06	Mudstone #	23/08/2021
MS1BH02	25.90	Axial/Unknown	100.3	75.8	0.4	9679.1	0.04	1.36	0.049	Mudstone #	23/08/2021
MS1BH02	26.40	Diametral/Unknown	183.9	100.1	0.3	10016.0	0.03	1.37	0.041	Mudstone	23/08/2021
MS1BH02	26.40	Axial/Unknown	101.4	58.3	0.2	7519.7	0.03	1.28	0.039	Mudstone	23/08/2021
MS1BH02	27.00	Diametral/Unknown	101.0	40.9	0.9	5256.5	0.17	1.18	0.198	Mudstone #	23/08/2021
MS1BH02	27.80	Diametral/Unknown	289.5	97.8	0.2	9557.0	0.02	1.35	0.031	Mudstone #	23/08/2021
MS1BH02	27.80	Axial/Unknown	99.9	36.3	0.9	4615.6	0.19	1.15	0.215	Mudstone	23/08/2021
MS1BH02	28.40	Diametral/Unknown	159.4	101.2	0.4	10237.4	0.04	1.37	0.052	Mudstone	23/08/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # -Invalid Failure (Did not pass through both points) !-Too soft to register a reading

 Date of issue :- 31/08/2021 Client :- AECOM	Certificate No :- PL/4339/3 Contract Title :- AEG Contract No :- 4339	Signed :-  Name :- 	Page 3 of 10 AEG Contract No :- 4339	

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## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
MS1BH02	28.40	Axial/Unknown	101.9	37.6	0.8	4879.3	0.16	1.16	0.185	Mudstone #	23/08/2021
MS1BH03	23.70	Diametral/Unknown	161.5	89.7	2.8	8044.3	0.34	1.3	0.445	Mudstone	23/08/2021
MS1BH03	23.70	Axial/Unknown	98.7	73.7	2.2	9264.9	0.23	1.34	0.315	Mudstone	23/08/2021
MS1BH03	25.30	Diametral/Unknown	165.3	101.7	2.1	10344.9	0.2	1.38	0.276	Mudstone #	23/08/2021
MS1BH03	25.30	Axial/Unknown	102.0	35.0	3.5	4542.4	0.76	1.14	0.872	Mudstone	23/08/2021
MS1BH03	26.50	Diametral/Unknown	181.3	98.7	7.0	9733.8	0.72	1.36	0.974	Mudstone	23/08/2021
MS1BH03	26.50	Axial/Unknown	101.6	69.1	9.8	8944.1	1.09	1.33	1.453	Mudstone	23/08/2021
MS1BH03	28.50	Diametral/Unknown	208.7	91.4	6.1	8359.4	0.73	1.31	0.954	Mudstone	23/08/2021
MS1BH03	28.50	Axial/Unknown	96.5	71.7	3.6	8817.3	0.41	1.33	0.545	Mudstone #	23/08/2021
MS1BH04	25.00	Diametral/Unknown	142.3	100.9	0.7	10188.9	0.07	1.37	0.093	Mudstone	23/08/2021
MS1BH04	25.00	Axial/Unknown	101.2	59.6	0.7	7678.3	0.1	1.29	0.125	Mudstone	23/08/2021
MS1BH04	25.60	Diametral/Unknown	245.7	98.0	4.1	9606.0	0.42	1.35	0.574	Mudstone	23/08/2021
MS1BH04	25.60	Axial/Unknown	98.1	48.0	12.1	5994.9	2.02	1.22	2.454	Mudstone	23/08/2021
MS1BH04	27.20	Axial/Unknown	100.6	29.4	0.4	3768.9	0.11	1.1	0.119	Mudstone #	23/08/2021

NOTES - + Tested specimen measured using calibrated vernier callipers #-Invalid Failure (Did not pass through both points) !-Too soft to register a reading

	Date of issue :- 31/08/2021	Certificate No :- PL/4339/4	Signed :- [Redacted]	Name :- [Redacted]	Page 4 of 10
	Client :- AECOM	Contract Title :- Preliminary Onshore Ground Investigation for NZT			AEG Contract No :- 4339
					

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## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)±	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
MSBH04	29.40	Diametral/Unknown	130.8	99.2	0.9	9848.6	0.09	1.36	0.126	Mudstone	23/08/2021
MSBH04	29.40	Axial/Unknown	99.5	56.4	4.4	7149.7	0.62	1.27	0.781	Mudstone	23/08/2021
MSBH04	29.90	Axial/Unknown	100.0	36.8	2.6	4682.2	0.56	1.15	0.64	Mudstone	23/08/2021
MSBH05	29.10	Axial/Unknown	101.4	56.1	4.6	7245.2	0.63	1.27	0.8	Mudstone	23/08/2021
MSBH06	23.70	Axial/Unknown	99.2	72.1	0.3	9115.3	0.04	1.34	0.048	Mudstone #	23/08/2021
MSBH06	29.10	Axial/Unknown	98.6	36.0	1.4	4519.7	0.3	1.14	0.343	Mudstone	23/08/2021
MSBH06	32.30	Axial/Unknown	97.5	40.0	1.8	4962.1	0.35	1.17	0.412	Mudstone #	23/08/2021
MSBH06	34.70	Axial/Unknown	97.7	44.9	3.6	5587.8	0.65	1.2	0.776	Mudstone	23/08/2021
MSBH06	36.50	Axial/Unknown	97.6	31.4	3.8	3896.6	0.99	1.11	1.089	Mudstone	23/08/2021
MSBH07	24.30	Irregular Lump	66.2	46.6	0.9	3929.0	0.22	1.11	0.24	Mudstone #	23/08/2021
MSBH07	26.40	Diametral/Unknown	94.6	59.7	0.2	3566.5	0.05	1.08	0.052	Mudstone #	23/08/2021
MSBH07	26.40	Axial/Unknown	67.4	42.6	0.2	3653.3	0.04	1.09	0.047	Mudstone #	23/08/2021
MSBH07	28.40	Axial/Unknown	82.9	31.8	1.6	3353.9	0.47	1.07	0.503	Mudstone	23/08/2021
MSBH07	28.90	Diametral/Unknown	130.4	84.1	1.5	7066.1	0.22	1.26	0.276	Mudstone	23/08/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # -Invalid Failure (Did not pass through both points) ! -Too soft to register a reading

<b>Date of issue :-</b> 31/08/2021	<b>Certificate No :-</b> PL/4339/5	<b>Signed :-</b> [Redacted]	<b>Name :-</b> WALTERS W	<b>Page 5 of 10</b>
<b>Client :-</b> AECOM	<b>Contract Title :-</b> Preliminary Onshore Ground Investigation for NZT		<b>AEG Contract No :-</b> 4339	





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Regional Office: Unit 20, Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL. - Tel: 01772 735 300 Fax: 01772 735 599

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
MSBH07	28.90	Axial/Unknown	84.7	46.1	2.2	4975.3	0.45	1.17	0.522	Mudstone	23/08/2021
MSBH07	35.20	Diametral/Unknown	103.1	83.5	1.4	6963.9	0.2	1.26	0.257	Mudstone	23/08/2021
MSBH07	35.20	Axial/Unknown	83.8	50.1	1.9	5340.4	0.36	1.19	0.423	Mudstone	23/08/2021
MSBH08	24.90	Diametral/Unknown	148.1	86.9	0.7	7546.4	0.09	1.28	0.111	Mudstone	23/08/2021
MSBH08	24.90	Axial/Unknown	99.3	53.9	0.7	6812.2	0.1	1.25	0.12	Mudstone	23/08/2021
MSBH08	27.35	Axial/Unknown	101.0	82.3	1.2	10571.9	0.11	1.38	0.146	Mudstone	23/08/2021
MSBH08	28.30	Axial/Unknown	100.3	31.5	2.8	4019.5	0.69	1.11	0.77	Mudstone	23/08/2021
MSBH08	29.70	Diametral/Unknown	148.3	99.2	0.5	9838.7	0.05	1.36	0.07	Mudstone #	23/08/2021
MSBH08	29.70	Axial/Unknown	100.7	49.5	0.6	6340.3	0.1	1.23	0.125	Mudstone #	23/08/2021
MSBH09	22.00	Axial/Unknown	70.1	28.3	1.3	2522.2	0.52	1	0.518	Mudstone #	23/08/2021
MSBH09	24.30	Axial/Unknown	101.3	55.4	3.9	7138.8	0.55	1.27	0.7	Mudstone	23/08/2021
MSBH09	25.90	Diametral/Unknown	142.8	71.0	6.8	5036.7	1.35	1.17	1.586	Mudstone	23/08/2021
MSBH09	25.90	Axial/Unknown	71.5	64.7	7.9	5891.9	1.34	1.21	1.624	Mudstone	23/08/2021
MSBH09	27.30	Diametral/Unknown	166.7	100.9	9.4	10176.8	0.92	1.37	1.266	Mudstone	23/08/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # -Invalid Failure (Did not pass through both points) ! -Too soft to register a reading



Date of issue :-

31/08/2021

Certificate No :-

PL/4339/6

Signed :-

[Redacted Signature]

Name :-

A. SELVARAJ

Client :-

AECOM

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

Page 6 of 10

AEG Contract No :-

4339



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## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
MS1BH09	27.30	Axial/Unknown	101.1	78.5	9.6	10101.6	0.95	1.37	1.297	Mudstone	23/08/2021
MS1BH09	29.80	Diametral/Unknown	154.2	91.2	0.3	8315.6	0.04	1.31	0.047	Mudstone	23/08/2021
MS1BH09	29.80	Axial/Unknown	101.4	33.8	0.5	4369.8	0.11	1.13	0.126	Mudstone	23/08/2021
MS1BH09	33.70	Diametral/Unknown	140.9	100.5	1.0	10098.2	0.1	1.37	0.131	Mudstone	23/08/2021
MS1BH09	33.70	Axial/Unknown	100.7	60.2	2.5	7708.3	0.32	1.29	0.414	Mudstone	23/08/2021
MS1BH10	21.50	Axial/Unknown	99.9	49.8	0.4	6340.1	0.06	1.23	0.076	Mudstone	23/08/2021
MS1BH10	22.00	Diametral/Unknown	147.8	91.6	0.4	8394.2	0.04	1.31	0.056	Mudstone	23/08/2021
MS1BH10	22.00	Axial/Unknown	91.7	65.3	0.5	7627.2	0.06	1.29	0.077	Mudstone	23/08/2021
MS1BH10	22.80	Diametral/Unknown	190.9	92.8	0.3	8617.4	0.04	1.32	0.05	Mudstone	23/08/2021
MS1BH10	22.80	Axial/Unknown	93.4	58.8	1.6	6990.2	0.23	1.26	0.291	Mudstone	23/08/2021
MS1BH10	23.70	Diametral/Unknown	158.6	98.3	0.3	9664.9	0.03	1.36	0.041	Mudstone #	23/08/2021
MS1BH10	23.70	Axial/Unknown	98.7	75.3	0.2	9457.5	0.03	1.35	0.034	Mudstone #	23/08/2021
MS1BH10	24.85	Axial/Unknown	99.7	70.2	0.5	8905.0	0.06	1.33	0.081	Mudstone #	23/08/2021
MS1BH10	26.80	Axial/Unknown	98.8	51.3	2.0	6455.9	0.31	1.24	0.388	Mudstone	23/08/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # - Invalid Failure (Did not pass through both points) ! - Too soft to register a reading

<b>Date of issue :-</b> 31/08/2021	<b>Certificate No :-</b> PL/4339/7	<b>Signed :-</b> <span style="background-color: black; color: black;">[REDACTED]</span>	<b>Name :-</b> M. SELWARK
<b>Client :-</b> AECOM	<b>Contract Title :-</b> Preliminary Onshore Ground Investigation for NZT	<b>Page 7 of 10</b>	<b>AEG Contract No :-</b> 4339



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## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
MSBH10	28.25	Diametral/Unknown	152.8	95.2	1.1	9055.4	0.12	1.34	0.157	Mudstone	23/08/2021
MSBH10	28.25	Axial/Unknown	99.7	37.6	1.1	4767.2	0.24	1.16	0.278	Mudstone #	23/08/2021
MSBH10	28.80	Axial/Unknown	98.9	56.7	1.6	7140.8	0.22	1.27	0.275	Mudstone	23/08/2021
MSBH10	29.85	Diametral/Unknown	160.8	97.3	0.6	9459.5	0.06	1.35	0.082	Mudstone #	23/08/2021
MSBH10	29.85	Axial/Unknown	97.8	53.0	0.9	6601.2	0.13	1.24	0.161	Mudstone	23/08/2021
MSBH10	30.50	Axial/Unknown	98.0	34.0	0.7	4236.5	0.17	1.13	0.191	Mudstone	23/08/2021
MSBH10	31.85	Diametral/Unknown	127.5	98.0	0.3	9604.0	0.03	1.35	0.046	Mudstone #	23/08/2021
MSBH10	31.85	Axial/Unknown	98.0	36.9	2.9	4599.8	0.63	1.15	0.728	Mudstone	23/08/2021
MSBH10	34.45	Diametral/Unknown	250.9	99.2	3.3	9848.6	0.33	1.36	0.453	Mudstone	23/08/2021
MSBH10	34.45	Axial/Unknown	99.4	53.3	3.6	6750.7	0.54	1.25	0.675	Mudstone	23/08/2021
MSBH11	21.10	Diametral/Unknown	184.8	86.0	0.4	7394.3	0.06	1.28	0.071	Mudstone	23/08/2021
MSBH11	21.10	Axial/Unknown	102.0	46.2	0.4	5996.6	0.06	1.22	0.078	Mudstone	23/08/2021
MSBH11	23.70	Irregular Lump	55.3	23.0	2.2	1617.0	1.34	0.91	1.214	Mudstone	23/08/2021
MSBH11	26.20	Axial/Unknown	69.2	37.0	1.0	3262.2	0.32	1.06	0.34	Mudstone #	23/08/2021

NOTES - +Tested specimen measured using calibrated vernier calipers #-Invalid Failure (Did not pass through both points) !-Too soft to register a reading

Date of issue :-  
31/08/2021

Certificate No :-

PL/4339/8

Signed :-

Name :-

**M. SELKIRK**

Page 8 of 10

Client :-

AECOM

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

AEG Contract No :-

4339



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## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
MSBH11	27.90	Diametral/Unknown	122.9	99.0	0.7	9803.0	0.08	1.36	0.103	Mudstone	23/08/2021
MSBH11	27.90	Axial/Unknown	99.0	41.1	5.3	5177.2	1.02	1.18	1.203	Mudstone	23/08/2021
MSBH11	31.60	Axial/Unknown	99.7	28.1	2.3	3560.9	0.64	1.08	0.689	Mudstone #	23/08/2021
MSBH11	32.40	Axial/Unknown	101.7	81.5	0.5	10554.4	0.05	1.38	0.067	Mudstone #	23/08/2021
MSBH11	34.50	Axial/Unknown	101.4	48.2	7.2	6216.5	1.15	1.23	1.412	Mudstone	23/08/2021
MSBH12	20.45	Diametral/Unknown	236.6	41.9	0.8	1757.3	0.44	0.92	0.404	Mudstone	23/08/2021
MSBH12	20.45	Axial/Unknown	100.3	31.3	0.2	3994.3	0.06	1.11	0.068	Mudstone	23/08/2021
MSBH12	21.80	Diametral/Unknown	179.5	83.3	0.3	6933.9	0.04	1.26	0.054	Mudstone #	23/08/2021
MSBH12	21.80	Axial/Unknown	94.0	39.9	0.3	4777.5	0.05	1.16	0.061	Mudstone #	23/08/2021
MSBH12	23.45	Axial/Unknown	104.6	33.1	0.3	4404.4	0.06	1.14	0.068	Mudstone	23/08/2021
MSBH12	23.80	Axial/Unknown	96.6	52.3	0.3	6432.8	0.05	1.24	0.062	Mudstone	23/08/2021
MSBH12	25.00	Axial/Unknown	99.5	41.1	1.7	5211.2	0.32	1.18	0.374	Mudstone	23/08/2021
MSBH12	26.40	Diametral/Unknown	174.1	99.5	1.9	9894.3	0.19	1.36	0.258	Mudstone	23/08/2021
MSBH12	26.40	Axial/Unknown	99.8	51.6	2.9	6553.0	0.45	1.24	0.558	Mudstone	23/08/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # -Invalid Failure (Did not pass through both points) ; -Too soft to register a reading

Date of issue :-  
31/08/2021

Certificate No :-

PL/4339/9

Signed :-

[Redacted Signature]

Name :-

M. SELVARAJ

Page 9 of 10

Client :-

AECOM

Contract Title :-

Preliminary Onshore Ground Investigation for NZT

AEG Contract No :-

4339



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Peaton Fell, Chester-le-Street, Co. Durham, DH2 2RG. Tel: 0191 387 4700 Fax: 0191 387 4710  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL. Tel: 01772 735 300 Fax: 01772 735 999

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
MSBH12	26.96	Diametral/Unknown	194.9	98.5	17.1	9706.2	1.76	1.36	2.384	Mudstone	23/08/2021
MSBH12	26.96	Axial/Unknown	99.8	54.3	17.1	6902.2	2.47	1.26	3.105	Mudstone	23/08/2021
MSBH12	28.40	Diametral/Unknown	229.7	99.3	13.2	9856.5	1.34	1.36	1.822	Mudstone	23/08/2021
MSBH12	28.40	Axial/Unknown	100.3	43.7	22.9	5583.7	4.11	1.22	4.92	Mudstone	23/08/2021
MSBH13	18.00	Axial/Unknown	93.9	74.2	0.4	8874.0	0.05	1.33	0.065	Mudstone	23/08/2021
MSBH13	18.58	Diametral/Unknown	151.9	97.3	0.3	9469.2	0.03	1.35	0.041	Mudstone	23/08/2021
MSBH13	18.58	Axial/Unknown	97.5	61.5	0.3	7635.6	0.04	1.29	0.045	Mudstone	23/08/2021
MSBH13	18.90	Axial/Unknown	100.2	57.3	0.3	7312.1	0.04	1.27	0.056	Mudstone	23/08/2021
MSBH13	20.20	Axial/Unknown	99.7	28.8	3.5	3650.7	0.95	1.09	1.037	Mudstone	23/08/2021
MSBH14	21.00	Axial/Unknown	98.4	32.3	1.4	4052.2	0.35	1.11	0.387	Mudstone	23/08/2021

NOTES - + Tested specimen measured using calibrated vernier calipers #-Invalid Failure (Did not pass through both points) !-Too soft to register a reading



Date of issue :-

31/08/2021

Certificate No :-

PL/4339/10

Signed :-

[Redacted Signature]

Name :-

M. SELKIRK

Page 10 of 10

AEG Contract No :-

4339

Contract Title :-



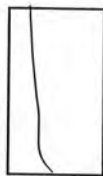

Preliminary Onshore Ground Investigation for NZT



1367

**Determination of Unconfined Compressive Strength  
(Tested Externally)**



Exploration Point		LF\BH01	LF\BH01	LF\BH02	LF\BH02
Depth	m	34.40	30.60	29.88	30.65
Date Received		02.09.21	02.09.21	02.09.21	02.09.21
Date Tested		03.09.21	03.09.21	03.09.21	03.09.21
Length	mm	106	221	224.2	177.2
Mean Diameter	mm	83.5	100	100	99.7
Length / Diameter Ratio		1.27	2.21	2.24	1.78
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0028	0.001	0.0013	0.0017
Bulk Density	Mg/m <sup>3</sup>	2.48	2.61	2.58	2.56
Moisture Content	%	3.1	2.6	3.5	4.7
Degree of Saturation	%	AS RECEIVED	AS RECEIVED	AS RECEIVED	AS RECEIVED
Stress Rate	MPa/sec	0.70	0.70	0.70	0.70
Test Duration		1 MIN 20 SEC	1 MIN 30 SEC	1 MIN 20 SEC	1 MIN 4 SEC
Failure Load	kN	95.6	97.3	96.9	89.7
Uniaxial Compressive Strength	MPa	17.5	12.4	12.3	11.5
Type of Failure		NORMAL	NORMAL	NORMAL	NORMAL
Strength Classification		WEAK	WEAK	WEAK	WEAK
Associated Comment Numbers (see notes)		3,7	7	7	3,7
Failure Diagram					

**Notes:**

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

Originator





Checked & Approved

SE

28/09/2021

**UNIAXIAL COMPRESSIVE STRENGTH**  
ASTM Methods



Exploration Point		MS\BH02	MS\BH03	MS\BH07	MS\BH07
Depth	m	28.70	26.20	28.44	29.00
Date Received		02.09.21	02.09.21	02.09.21	02.09.21
Date Tested		03.09.21	03.09.21	03.09.21	03.09.21
Length	mm	193	206.7	156.2	129.3
Mean Diameter	mm	100	101.3	82.2	83.5
Length / Diameter Ratio		1.93	2.04	1.90	1.55
Straightness Compliance (see notes)	Y/N	Y	Y	Y	Y
Flatness Compliance (see notes)	Y/N	Y	Y	Y	Y
Perpendicularity	mm	0.0016	0.0015	0.0019	0.0015
Bulk Density	Mg/m <sup>3</sup>	2.65	2.57	2.52	2.5
Moisture Content	%	4.5	2	3	2.7
Degree of Saturation	%	AS RECEIVED	AS RECEIVED	AS RECEIVED	AS RECEIVED
Stress Rate	MPa/sec	0.70	0.70	0.70	0.70
Test Duration		55 SECONDS	2 MIN 2 SEC	50 SECONDS	46 SECONDS
Failure Load	kN	21.7	138.8	58.4	77
Uniaxial Compressive Strength	MPa	2.8	17.2	11.0	14.1
Type of Failure		NORMAL	NORMAL	NORMAL	NORMAL
Strength Classification		VERY WEAK	WEAK	WEAK	WEAK
Associated Comment Numbers (see notes)		3,7		3,7	
Failure Diagram					


**Notes:**

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
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Originator

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28/09/2021

**UNIAXIAL COMPRESSIVE STRENGTH**  
ASTM Methods





	Site	PRELIMINARY ONSHORE GROUND INVESTIGATION FOR NZT	Contract No <b>A14067</b>
	Client		
	Engineer		

Exploration Point		MS1BH11	MS1BH12		
Depth	m	35.00	25.50		
Date Received		02.09.21	02.09.21		
Date Tested		03.09.21	03.09.21		
Length	mm	207	206.5		
Mean Diameter	mm	101.7	100		
Length / Diameter Ratio		2.04	2.07		
Straightness Compliance (see notes)	Y/N	Y	Y		
Flatness Compliance (see notes)	Y/N	Y	Y		
Perpendicularity	mm	0.0015	0.0015		
Bulk Density	Mg/m <sup>3</sup>	2.63	2.59		
Moisture Content	%	3.6	4.7		
Degree of Saturation	%	AS RECEIVED	AS RECEIVED		
Stress Rate	MPa/sec	0.70	0.70		
Test Duration		1 MIN 5 SEC	44 SECONDS		
Failure Load	kN	70.4	40.4		
Uniaxial Compressive Strength	MPa	8.7	5.1		
Type of Failure		NORMAL	NORMAL		
Strength Classification		WEAK	WEAK		
Associated Comment Numbers (see notes)		7	7		
Failure Diagram					


**Notes:**

1. Prepared in accordance with ASTM D4543-08.
2. Tested in accordance with ASTM D7012-14: Method C
3. Height/diameter ratio outwith limits of 2.0 to 2.5. Best effort conformance accepted - tested as is.
4. Straightness of core more than 0.50mm over length. Best effort conformance accepted - tested as is.
5. Flatness of core ends more than 0.025mm. Best effort conformance accepted - tested as is.
6. Perpendicularity of core more than 0.0043mm. Best effort conformance accepted - tested as is.
7. Test duration not falling between 2 and 15 minutes. Best effort conformance accepted.
8. There are some rock types with physical characteristics which preclude preparing specimens to the desired tolerances. Where this is the case the specimen is evaluated to determine whether a best effort was achieved for the rock type involved. Based upon the evaluation and professional judgement a determination is made whether the specimen should be discarded, tested as is, use of capping compound or start over.
9. Preparation and conformance measuring equipment: surface plate, V-block, displacement gauge assembly, feeler gauge set, vernier calipers, surface grinder and masonry saw.

Originator	Checked & Approved	<b>UNIAXIAL COMPRESSIVE STRENGTH</b> ASTM Methods	
SE	 28/09/2021		

<b>TERRA TEK</b> <small>SITE INVESTIGATION AND LABORATORY SERVICES</small>	Site	PRELIMINARY ONSHORE GROUND INVESTIGATION FOR NZT	Contract No	<b>A14067</b>
	Client		Hole ID	LFVBH01
	Engineer		Sample Ref	
			Depth (m)	30.60
			Sample Type	C



Originator	Checked & Approved	<b>PHOTOGRAPHS OF SPECIMEN FAILURE</b>	
SE	28/09/2021		


<b>TERRA TEK</b> <small>SITE INVESTIGATION AND LABORATORY SERVICES</small>	Site PRELIMINARY ONSHORE GROUND INVESTIGATION FOR NZT	Contract No <b>A14067</b>
	Client Engineer	Hole ID LF\BH01 Sample Ref Depth (m) 34.40 Sample Type C



Originator	Checked & Approved	<b>PHOTOGRAPHS OF SPECIMEN FAILURE</b>	
SE	 28/09/2021		

<b>TERRA TEK</b> ■■■■ SITE INVESTIGATION AND LABORATORY SERVICES	Site	PRELIMINARY ONSHORE GROUND INVESTIGATION FOR NZT	Contract No	<b>A14067</b>
	Client		Hole ID	LFVBH02
	Engineer		Sample Ref	
			Depth (m)	29.88
			Sample Type	C




Originator	Checked & Approved	<b>PHOTOGRAPHS OF SPECIMEN FAILURE</b>
SE	 28/09/2021	

**TERRA TEK**  
 SITE INVESTIGATION AND LABORATORY SERVICES

Site	PRELIMINARY ONSHORE GROUND INVESTIGATION FOR NZT
Client	
Engineer	

Contract No	<b>A14067</b>
Hole ID	LF\BH02
Sample Ref	
Depth (m)	30.65
Sample Type	C



Originator	Checked & Approved
SE	 28/09/2021



**PHOTOGRAPHS OF SPECIMEN FAILURE**



<b>TERRA TEK</b> <small>SITE INVESTIGATION AND LABORATORY SERVICES</small>	Site	PRELIMINARY ONSHORE GROUND INVESTIGATION FOR NZT	Contract No	<b>A14067</b>
	Client		Hole ID	MS\BH02
Engineer			Sample Ref	
			Depth (m)	28.70
			Sample Type	C



Lab Project No A14067


Originator	Checked & Approved	<b>PHOTOGRAPHS OF SPECIMEN FAILURE</b>	
SE	 26/09/2021		

**TERRA TEK**  
 SITE INVESTIGATION AND LABORATORY SERVICES

Site PRELIMINARY ONSHORE GROUND INVESTIGATION FOR NZT  
 Client  
 Engineer

Contract No **A14067**  
 Hole ID MS\BH03  
 Sample Ref  
 Depth (m) 26.20  
 Sample Type C



Originator	Checked & Approved
SE	
	28/09/2021

**PHOTOGRAPHS OF SPECIMEN FAILURE**

