



ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell
 Chester-le-Street, Co.Durham. DH2 2RG
 a UKAS LABORATORY Testing No. 1367



1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No. 4339

Borehole: MS1BH05

Sample: B12

Depth: 5.70 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	20.7	21.8	22.4
Initial Moisture Content	%	22.0	22.0	22.0
Initial Wet density	mg/m ³	1.89	1.86	1.85
Initial Dry density	mg/m ³	1.55	1.53	1.52
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	50	100	200
Height at end of Stage	mm	20.2	21.2	21.7
Duration	Day(s)	0.5	0.5	0.5

SHEARING

Rate of Strain	mm/min	0.309	0.311	0.310
Peak Shear Stress	kPa	27.6	48.1	123.6
Displacement at Peak Stress	mm	1.93	4.78	8.96
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	22.4	22.8	22.6
Final Wet Density	mg/m ³	1.93	1.93	1.93
Final Dry Density	mg/m ³	1.58	1.57	1.57

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	0
Angle of Shearing Resistance phi 'r	Deg	30°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

REMARKS:

DATE TESTED 23/09/2021

DATE OF ISSUE 08/09/2021

NAME

Michelle Selkirk

APPROVED BY





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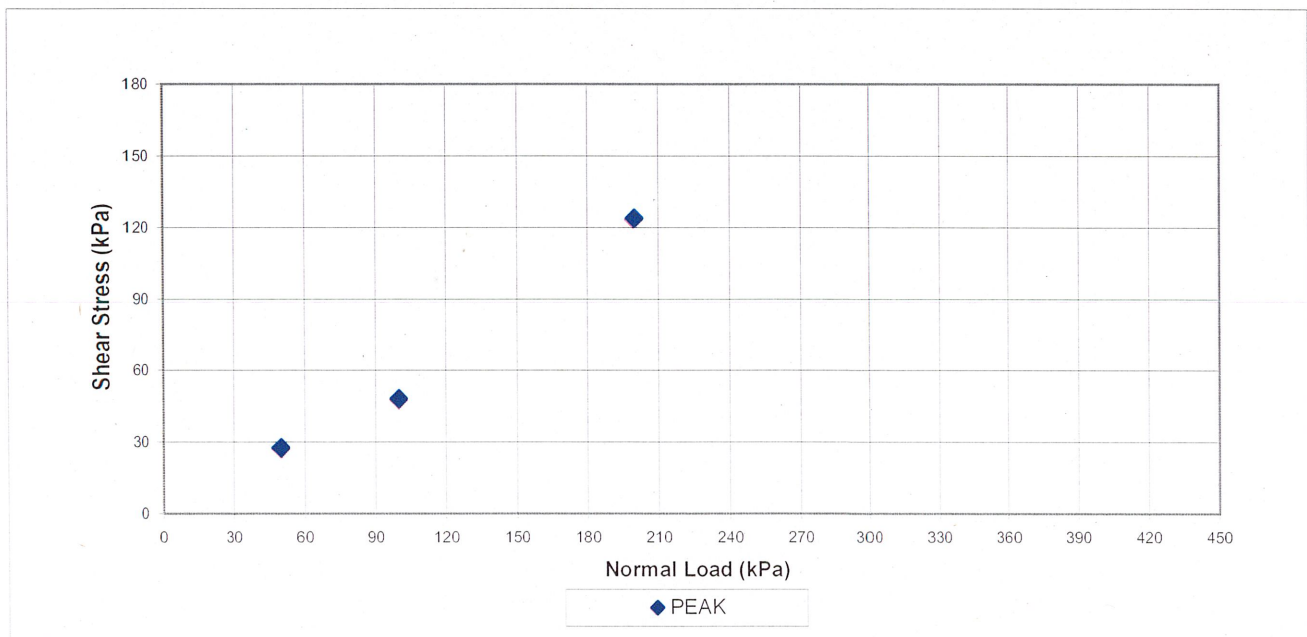
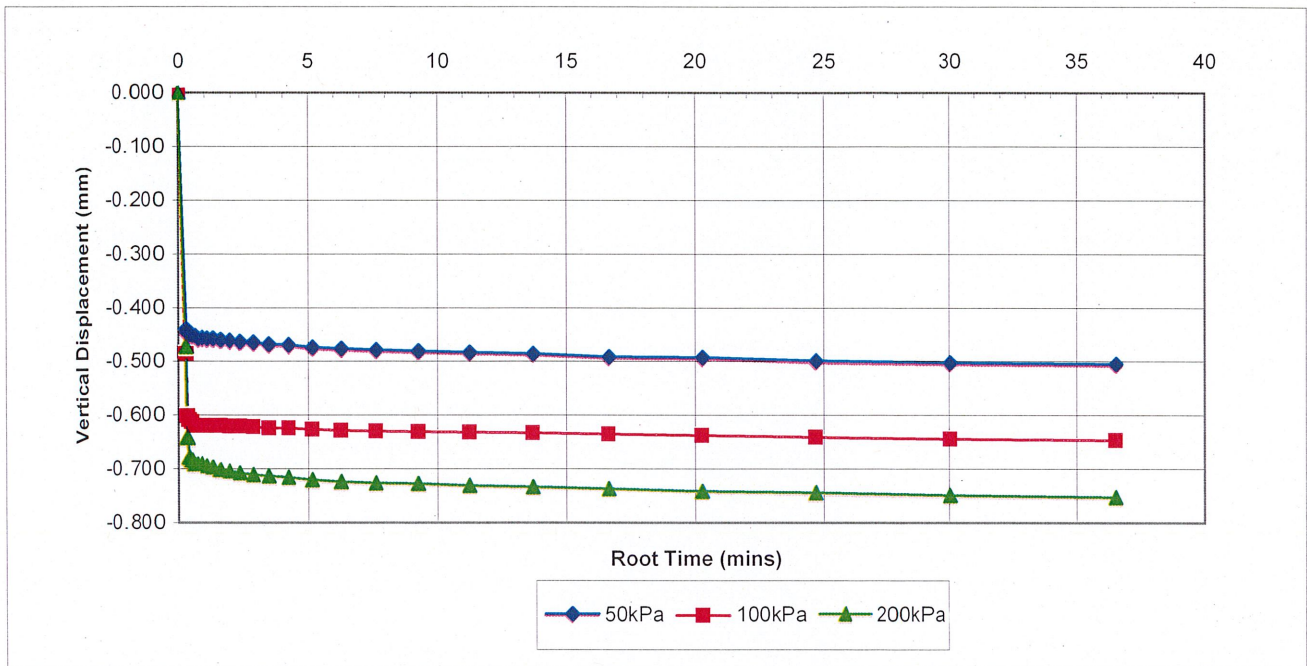
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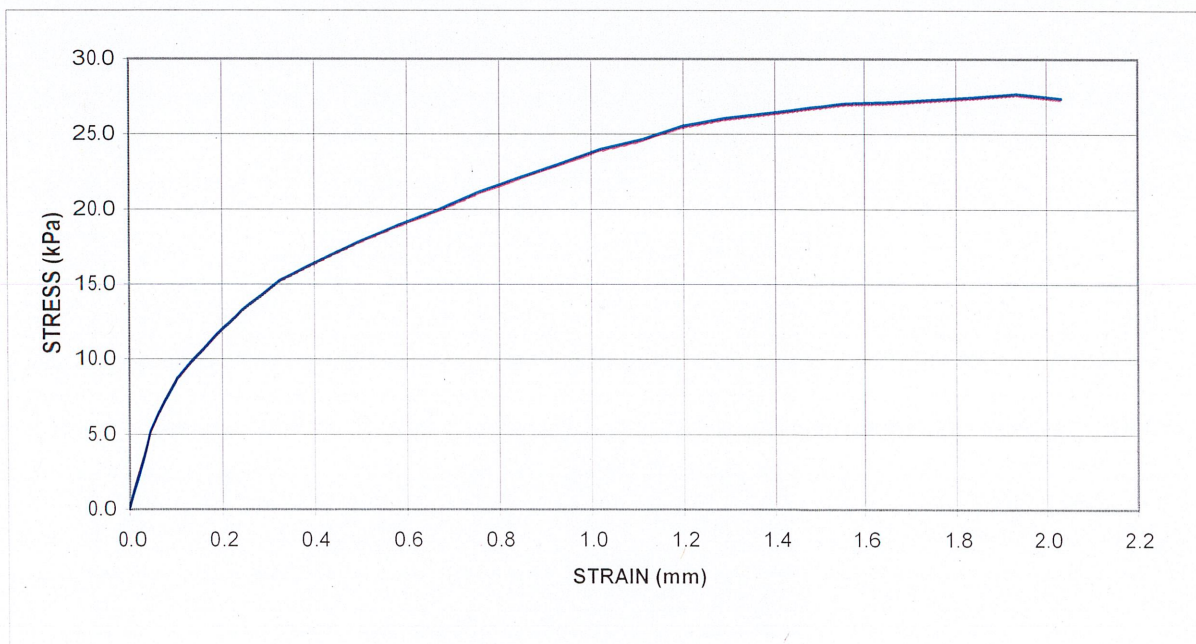
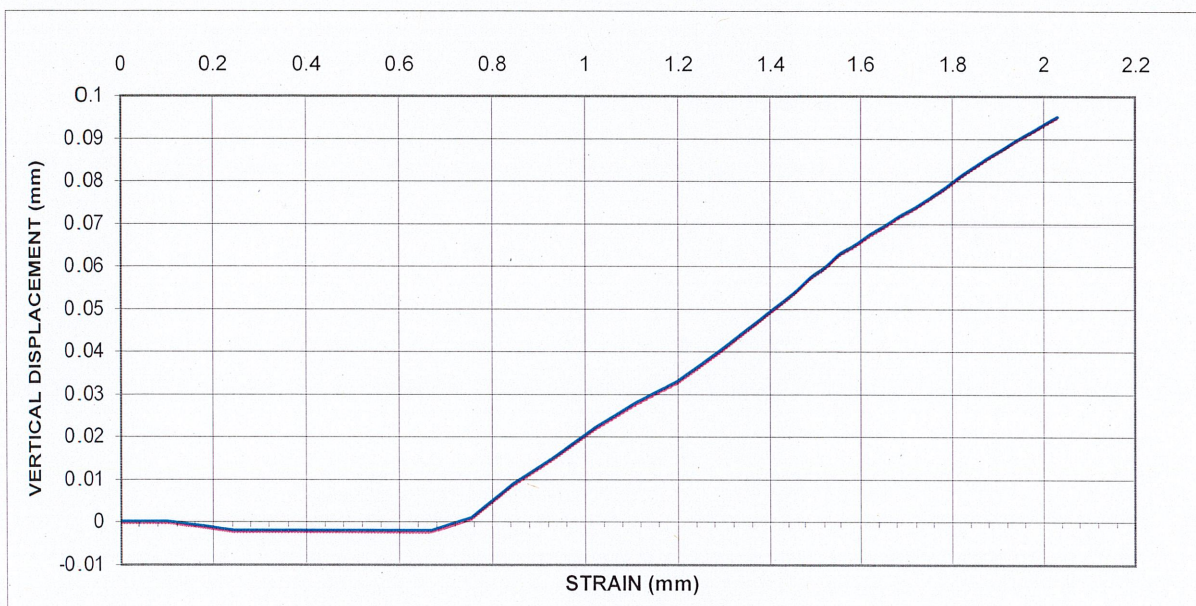
Borehole: MS\BH05

Sample: B12

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Stage Number 1

Pressure 50 kPa





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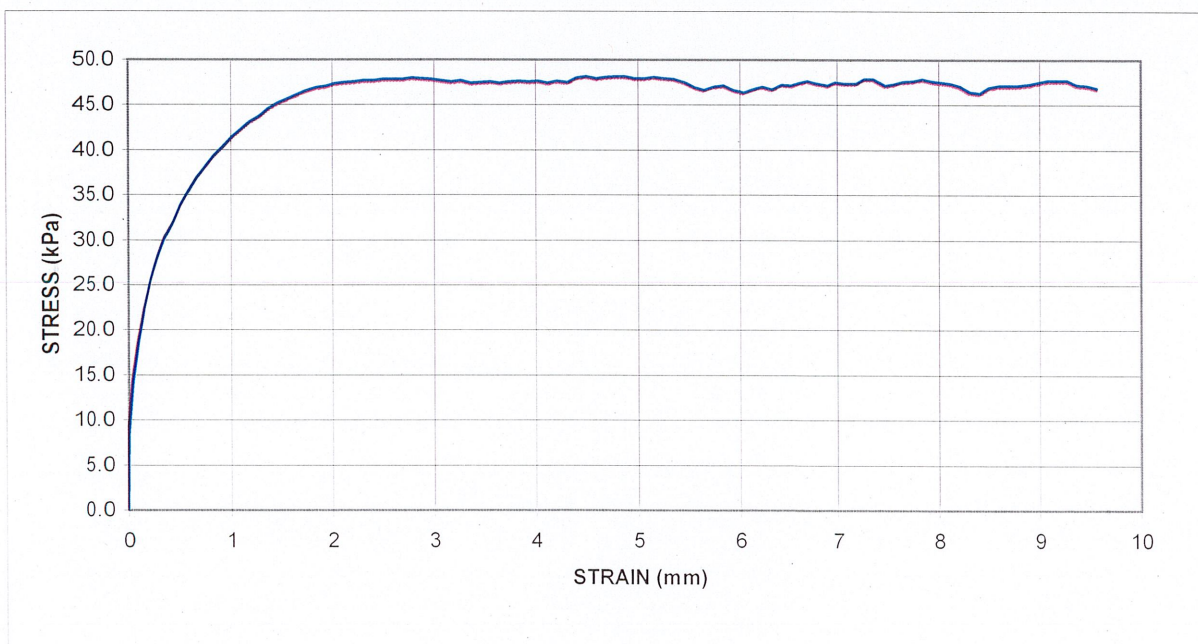
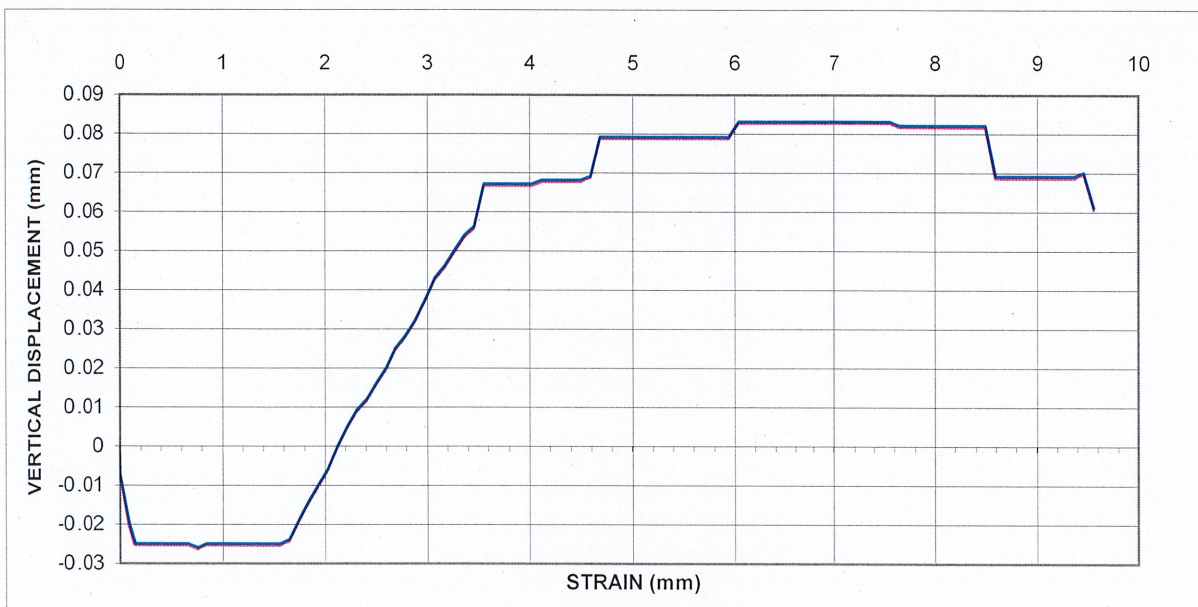
Borehole: MS\BH05

Sample: B12

Depth: 5.70 m.

Stage Number 2

Pressure 100 kPa





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Client: AECOM

Job No.: 4339

Borehole: MS\BH05

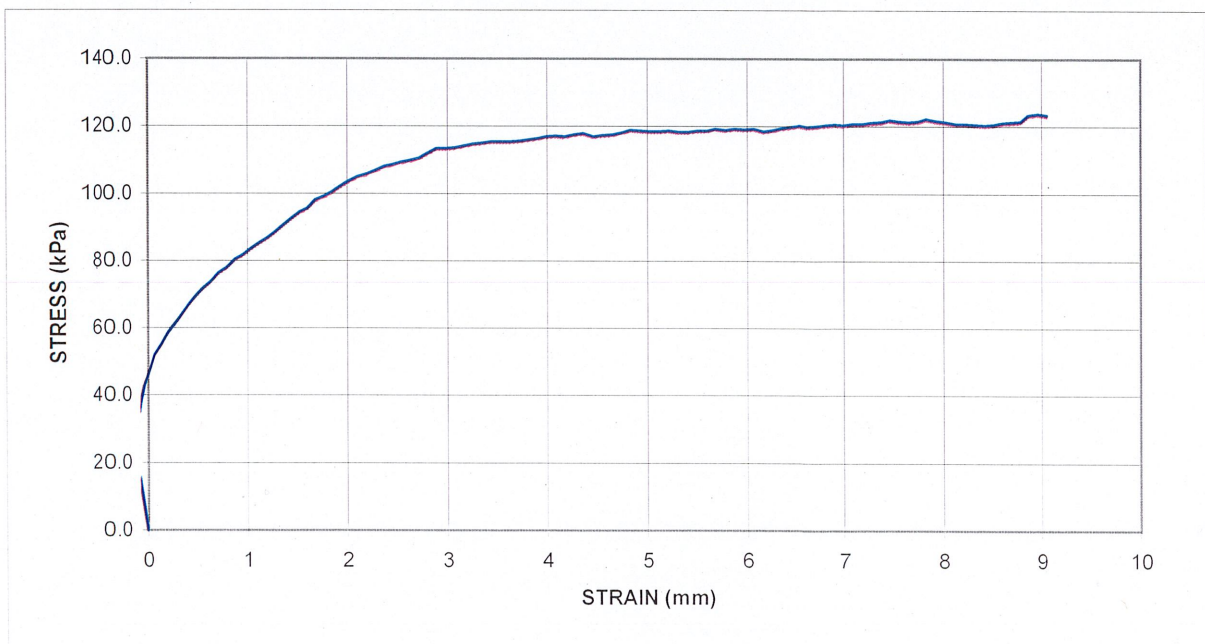
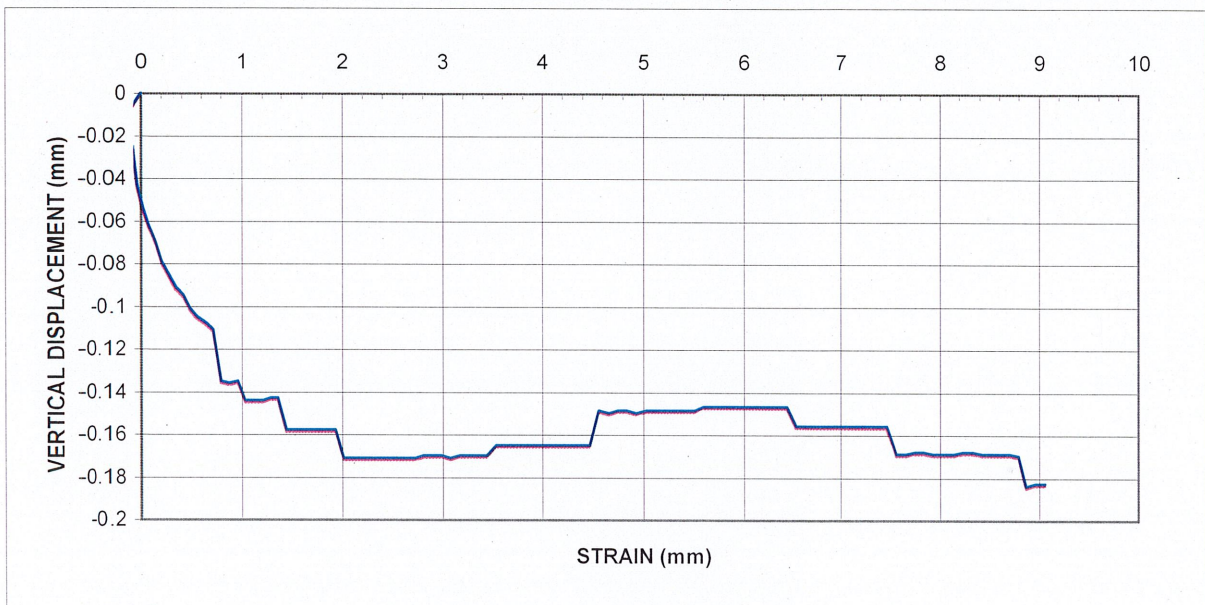
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Depth: 5.70 m.

Stage Number 3

Pressure 200 kPa

200 kPa





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(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No: 4339

Borehole: MS1BH05

Sample: B18

Depth: 7.95 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	25.3	25.0	24.4
Initial Moisture Content	%	20.1	20.1	20.1
Initial Wet density	mg/m ³	1.69	1.66	1.68
Initial Dry density	mg/m ³	1.41	1.38	1.40
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	60	120	240
Height at end of Stage	mm	24.9	24.4	23.8
Duration	Day(s)	0.5	0.5	0.5

SHEARING

Rate of Strain	mm/min	0.247	0.250	0.249
Peak Shear Stress	kPa	31.2	72.4	147.1
Displacement at Peak Stress	mm	3.10	3.69	7.23
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	23.8	23.9	23.7
Final Wet Density	mg/m ³	1.78	1.76	1.78
Final Dry Density	mg/m ³	1.43	1.42	1.44

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	0
Angle of Shearing Resistance phi '	Deg	31°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

REMARKS:

DATE TESTED 23/09/2021

DATE OF ISSUE 14/10/2021

NAME

APPROVED BY

Michelle Selkirk



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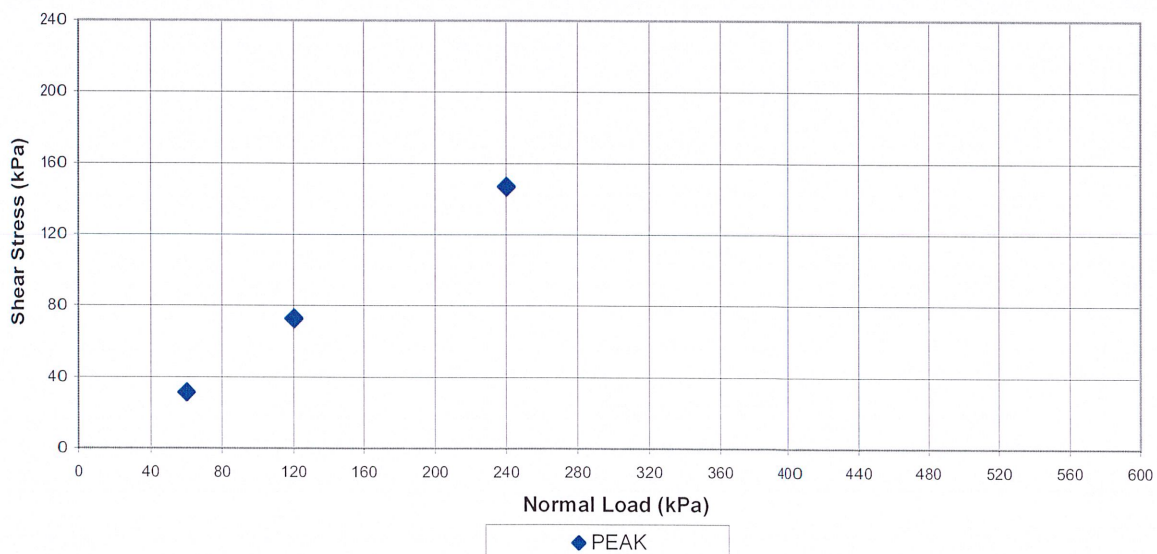
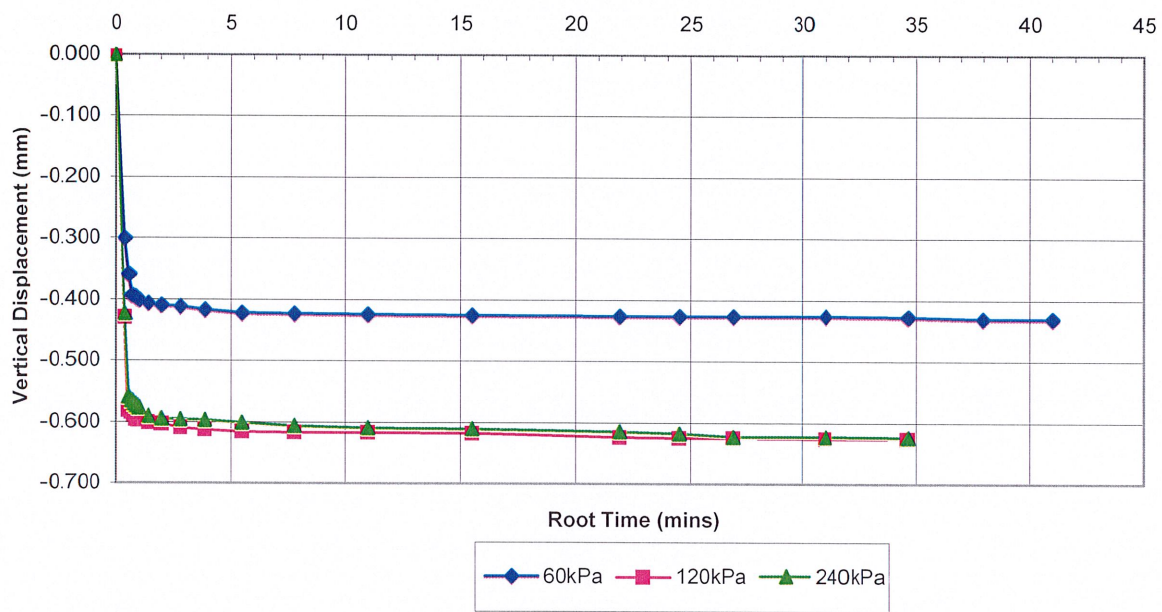
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Borehole: MS\BH05

Sample: B18

Depth: 7.95 m.





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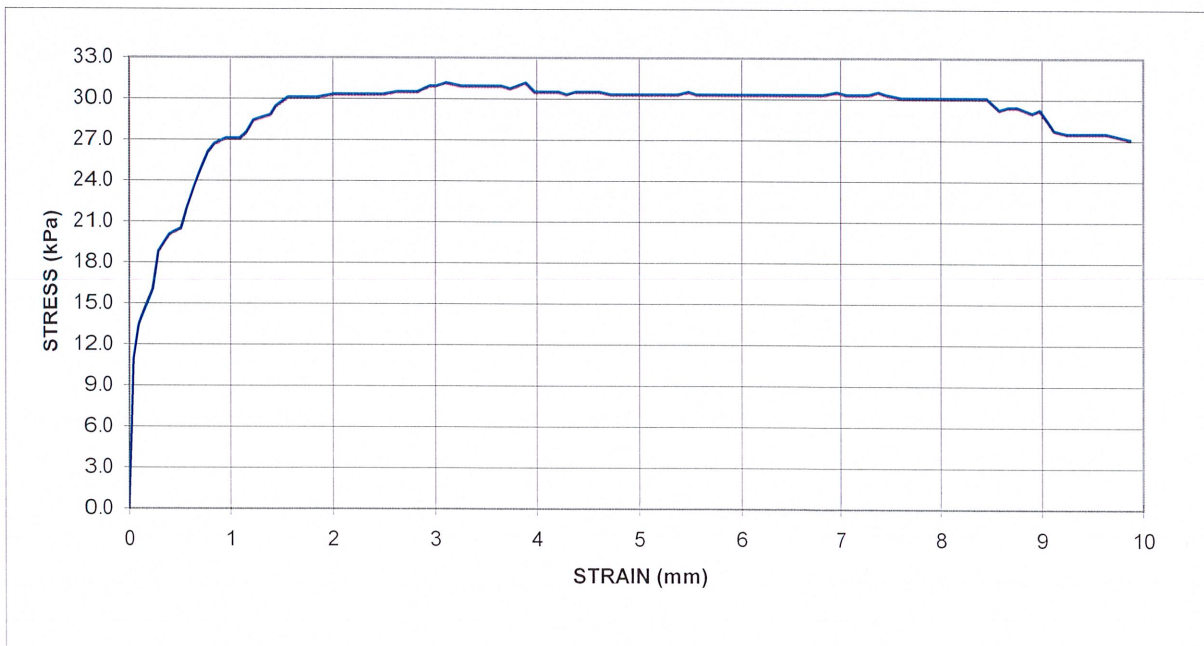
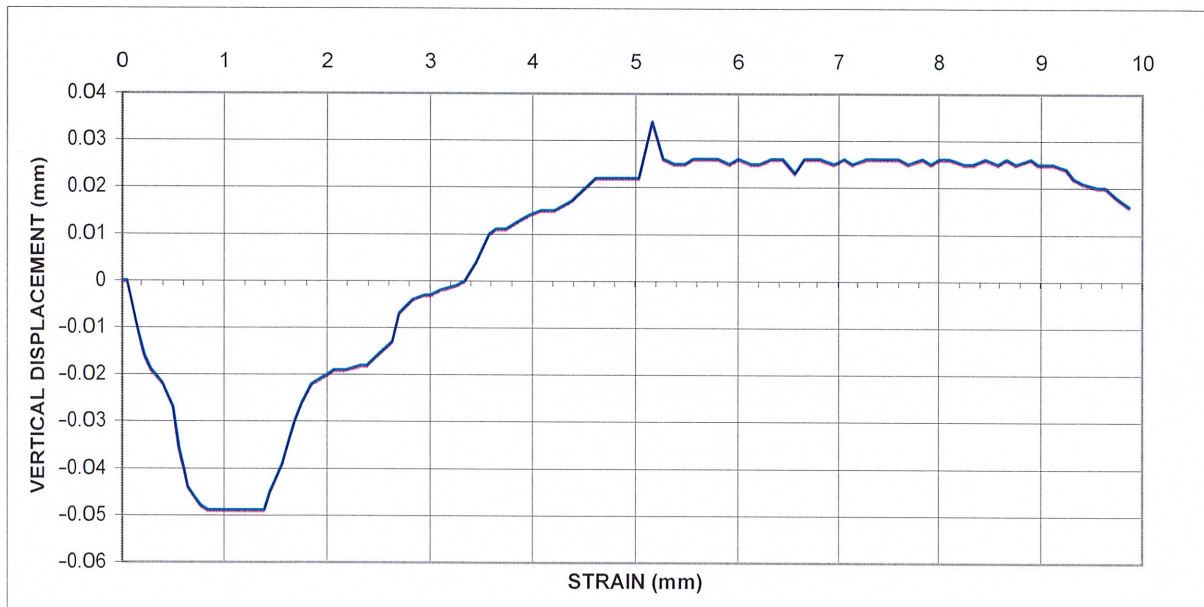
Borehole: MS\BH05

Sample: B18

Depth: 7.95 m.

Stage Number 1

Pressure 60 kPa





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Client: AECOM

Job No.: 4339

Borehole: MS\BH05

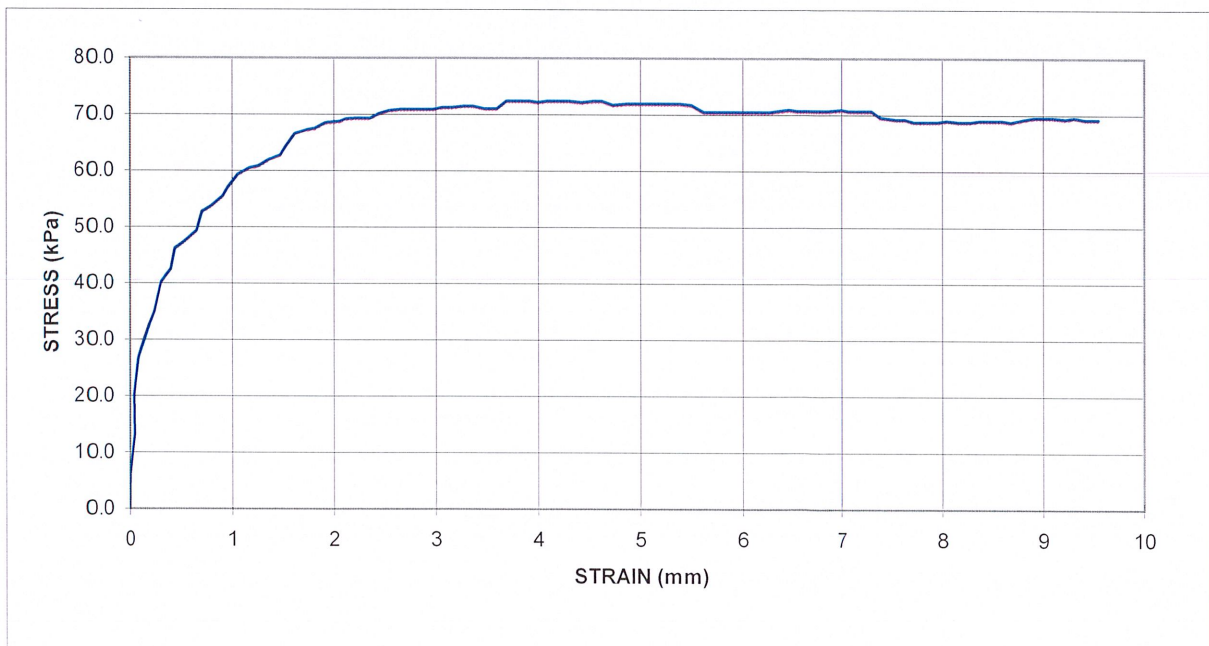
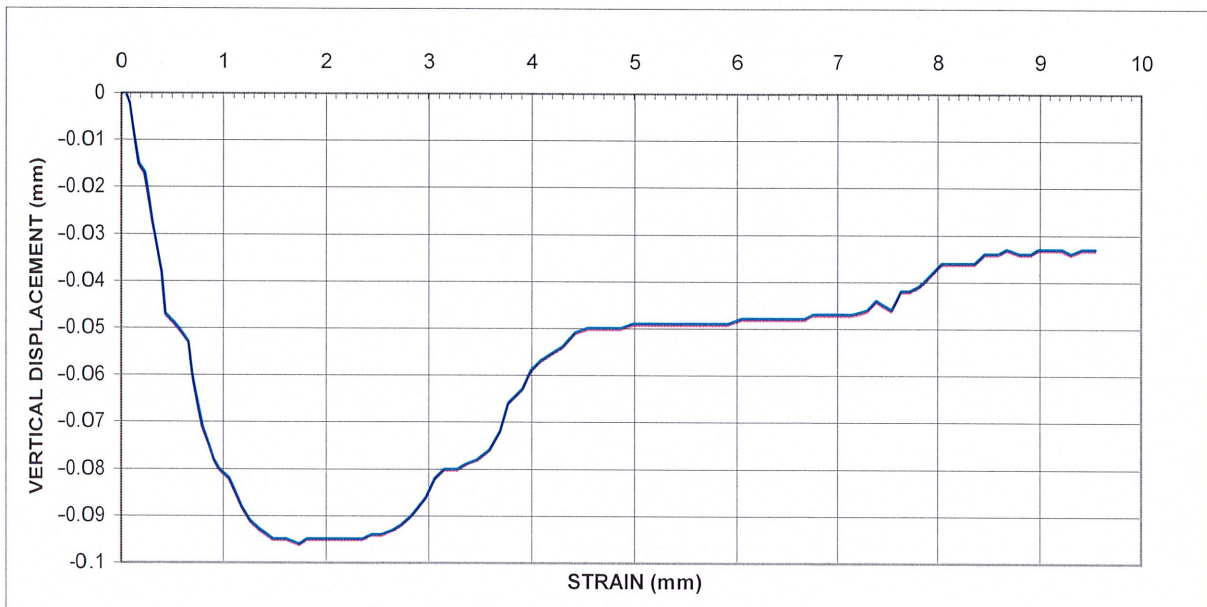
Sample: B18

Depth: 7.95 m.

Stage Number 2

Pressure 120 kPa

120 kPa





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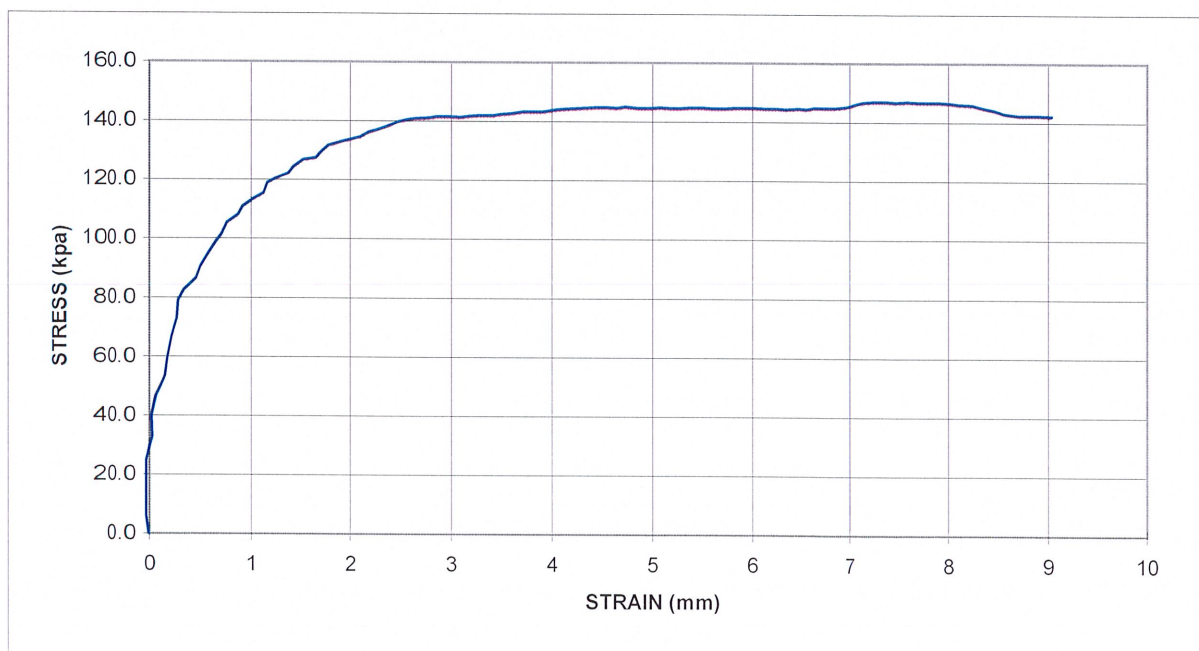
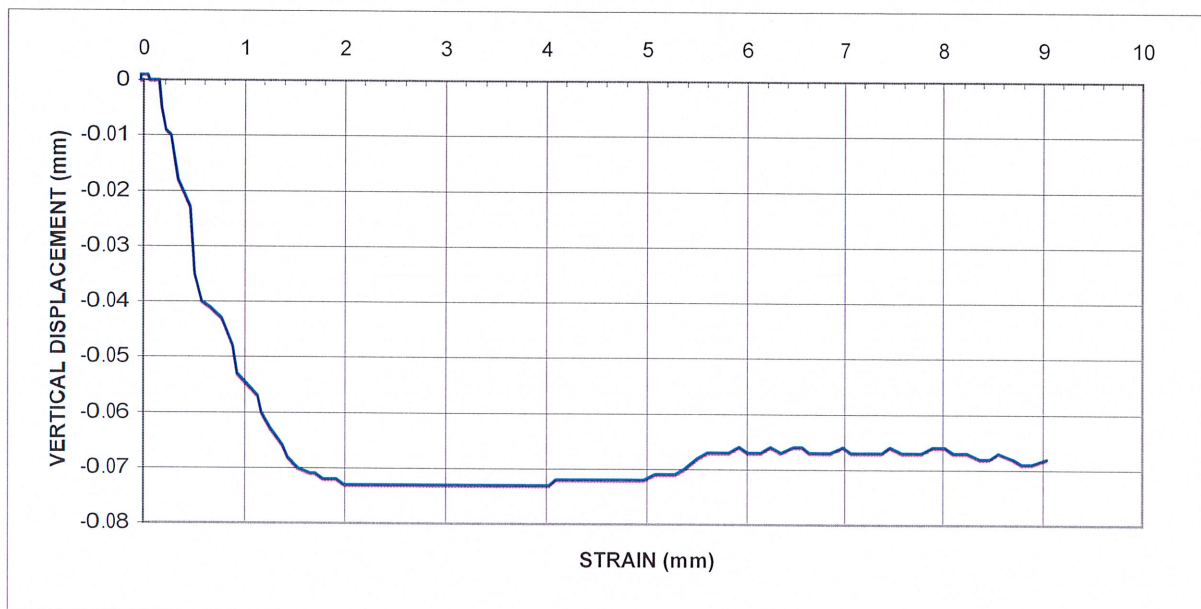
Borehole: MS\BH05

Sample: B18

Depth: 7.95 m.

Stage Number 3

Pressure 240 kPa





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Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No. 4339

Borehole: MS\BH05

Sample: B30

Depth: 12.45 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	25.4	25.1	24.7
Initial Moisture Content	%	19.6	19.6	19.6
Initial Wet density	mg/m ³	1.66	1.63	1.67
Initial Dry density	mg/m ³	1.39	1.37	1.39
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	85	165	330
Height at end of Stage	mm	24.1	24.0	23.3
Duration	Day(s)	1.0	0.5	0.5

SHEARING

Rate of Strain	mm/min	0.318	0.313	0.303
Peak Shear Stress	kPa	29.0	79.7	166.8
Displacement at Peak Stress	mm	7.10	6.79	5.37
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	24.3	23.8	23.7
Final Wet Density	mg/m ³	1.82	1.77	1.83
Final Dry Density	mg/m ³	1.46	1.43	1.48

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	0
Angle of Shearing Resistance phi '	Deg	27°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

REMARKS:

DATE TESTED 23/09/2021
DATE OF ISSUE 14/10/2021

NAME
APPROVED BY

Michelle Selkirk



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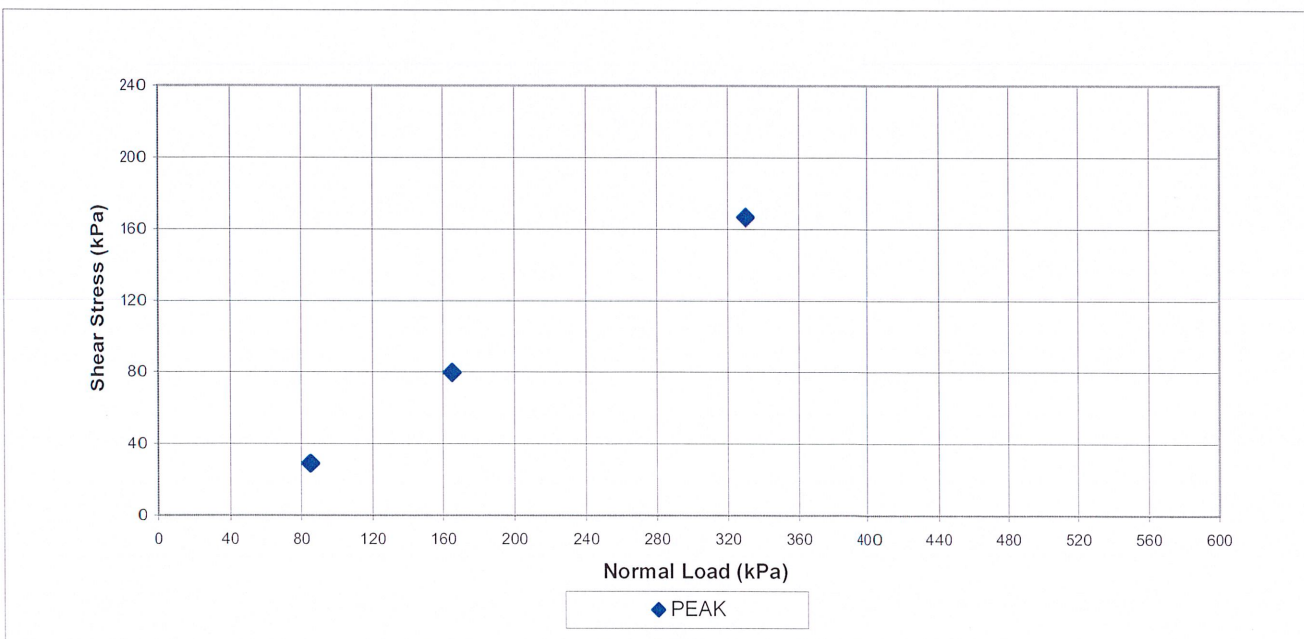
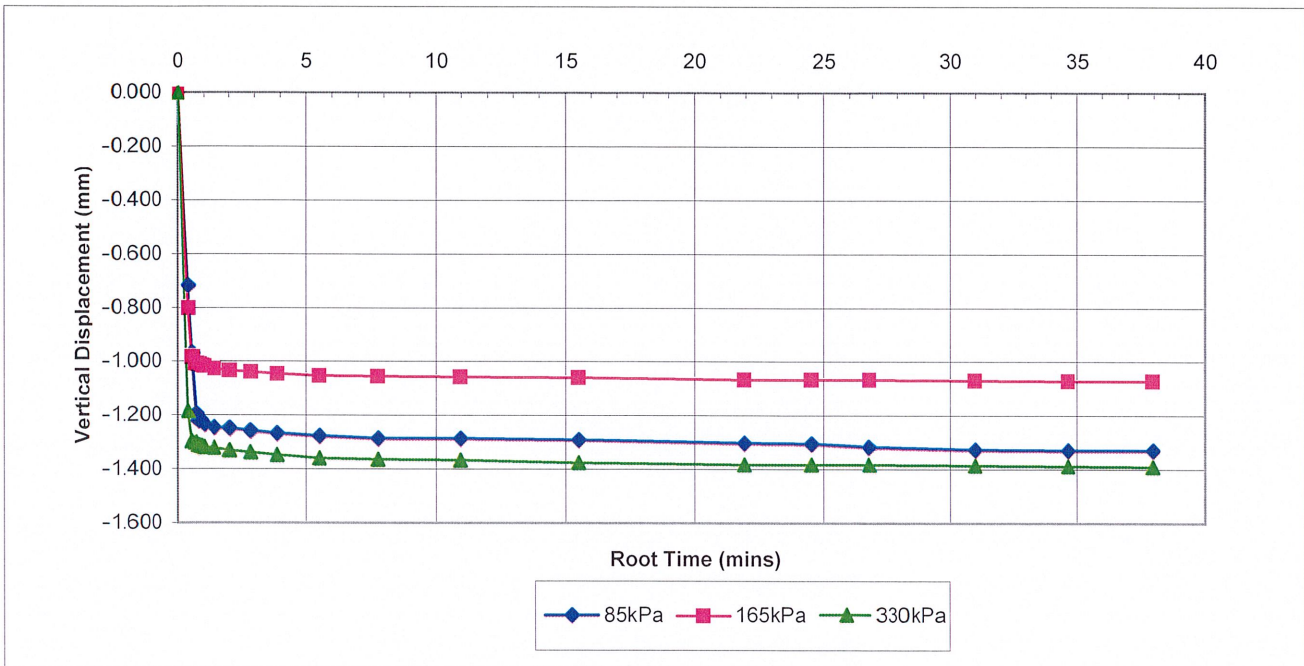
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Job No. 4339

Borehole: MS\BH05

Sample: B30

Depth: 12.45 m.





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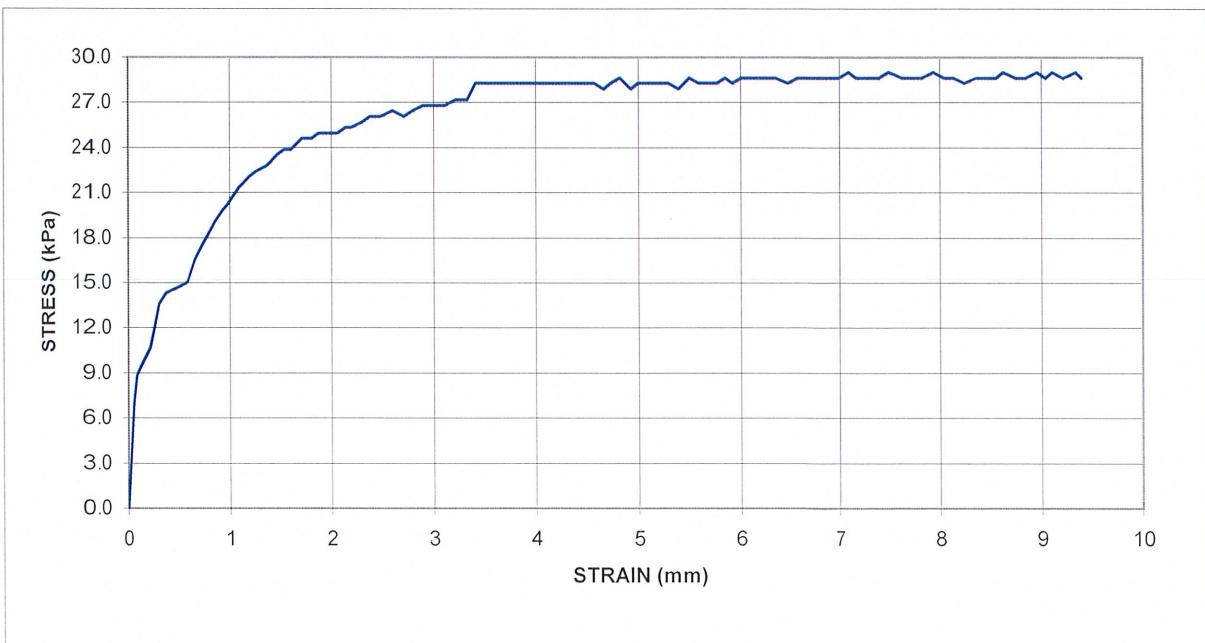
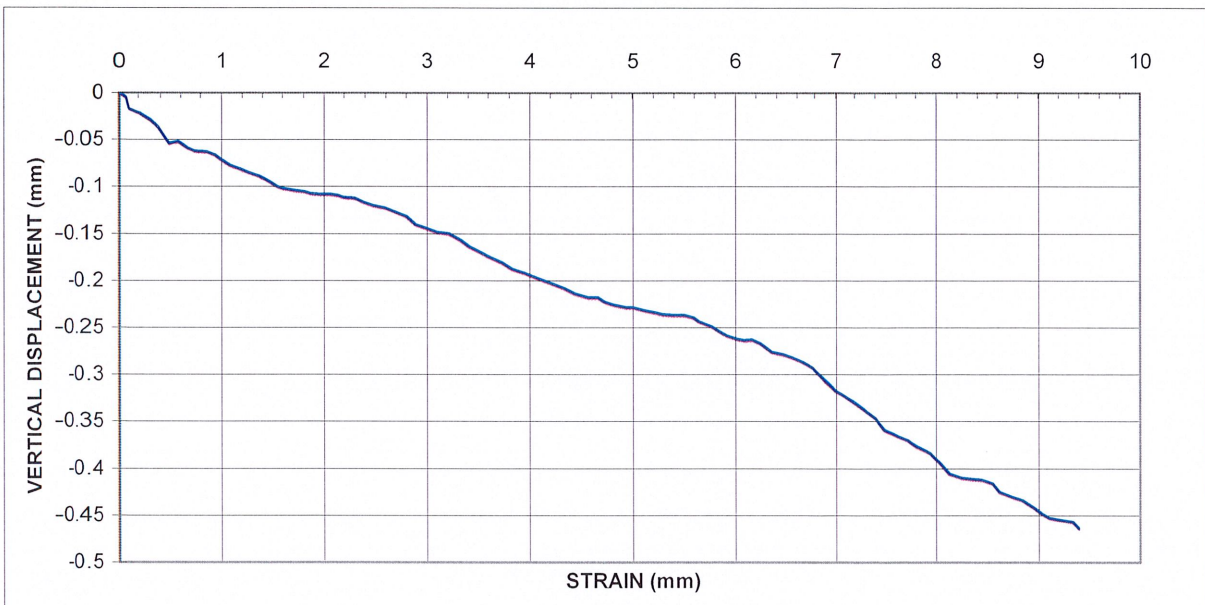
Sample: B30

Depth: 12.45 m.

Stage Number 1

Pressure 85 kPa

85 kPa





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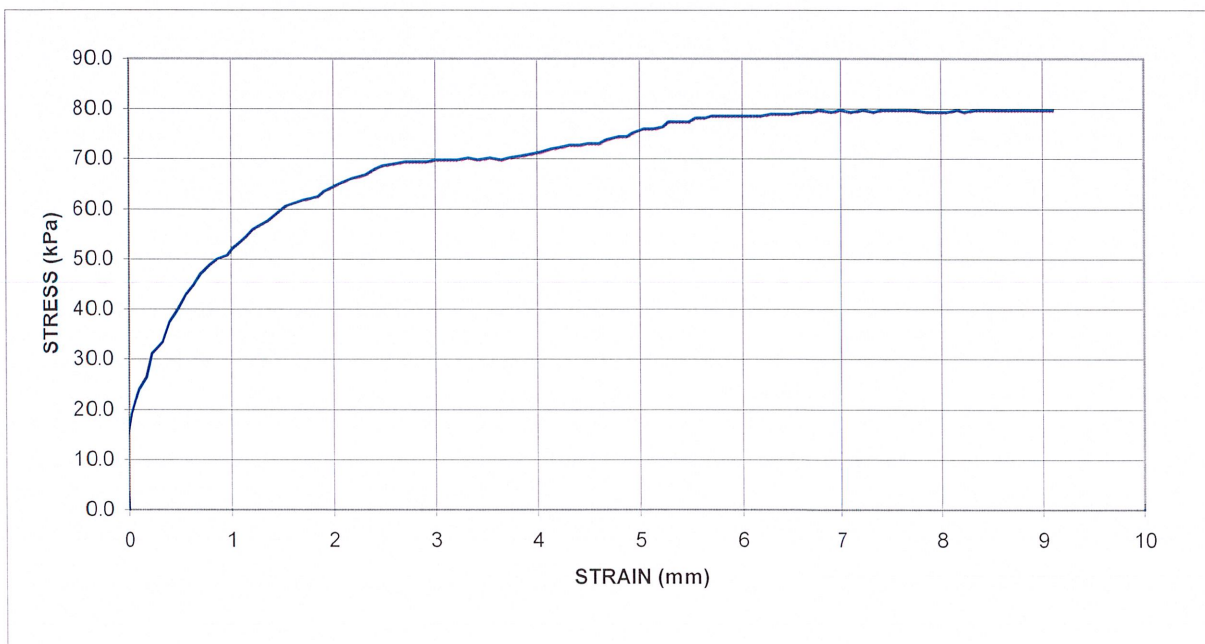
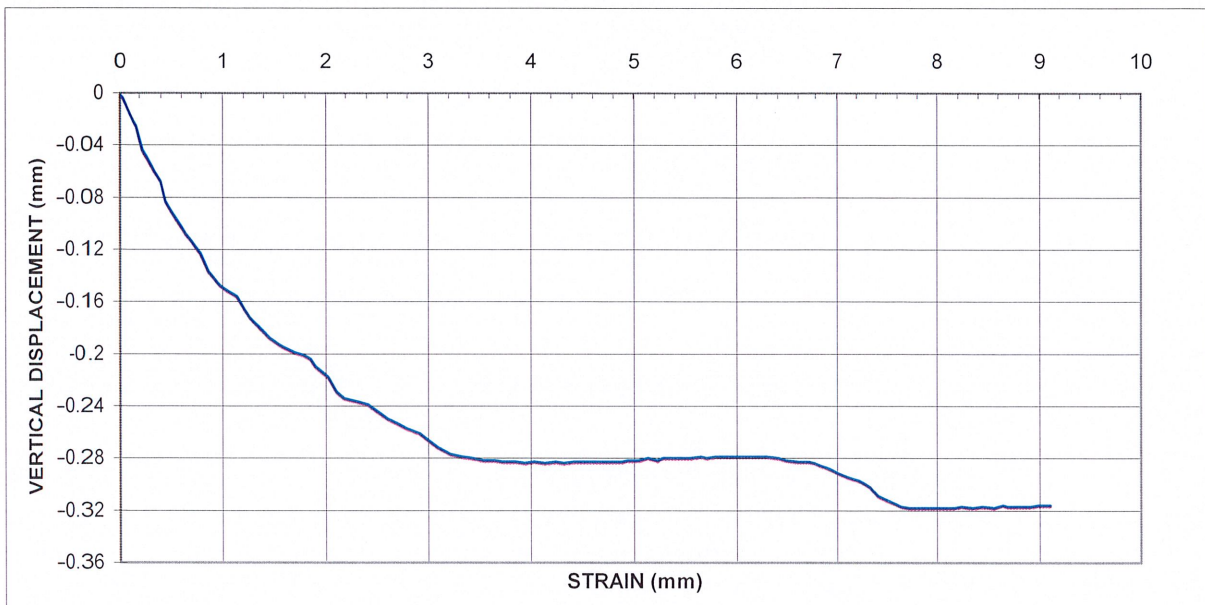
Sample: B30

Depth: 12.45 m.

Stage Number 2

Pressure 165 kPa

165 kPa





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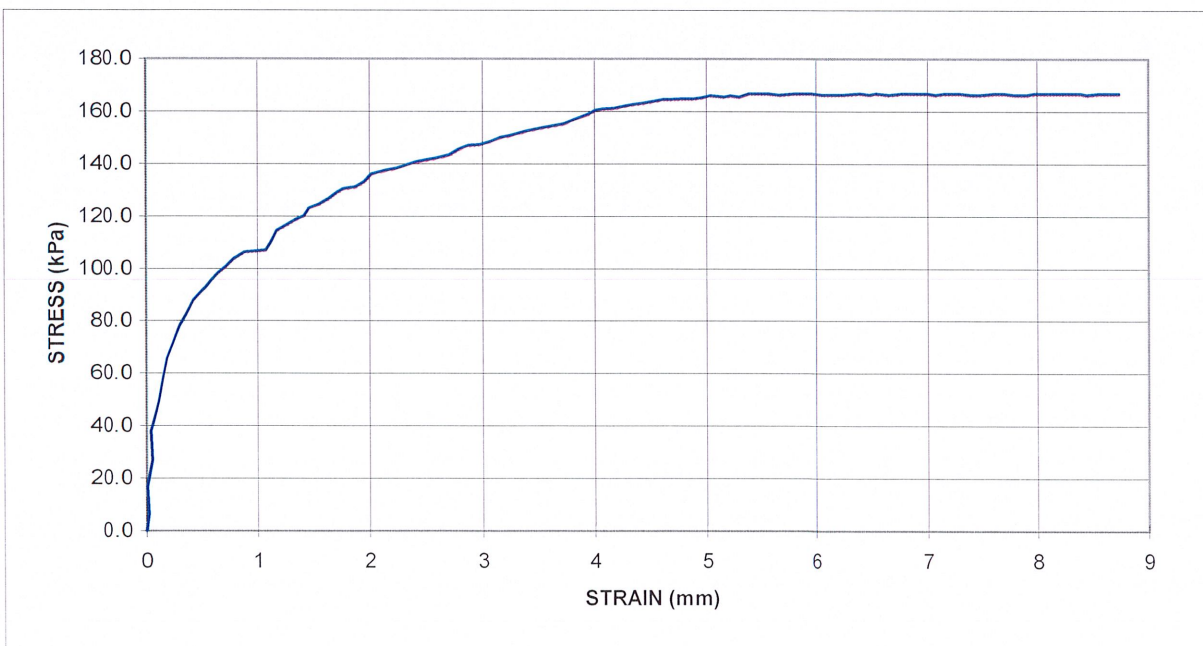
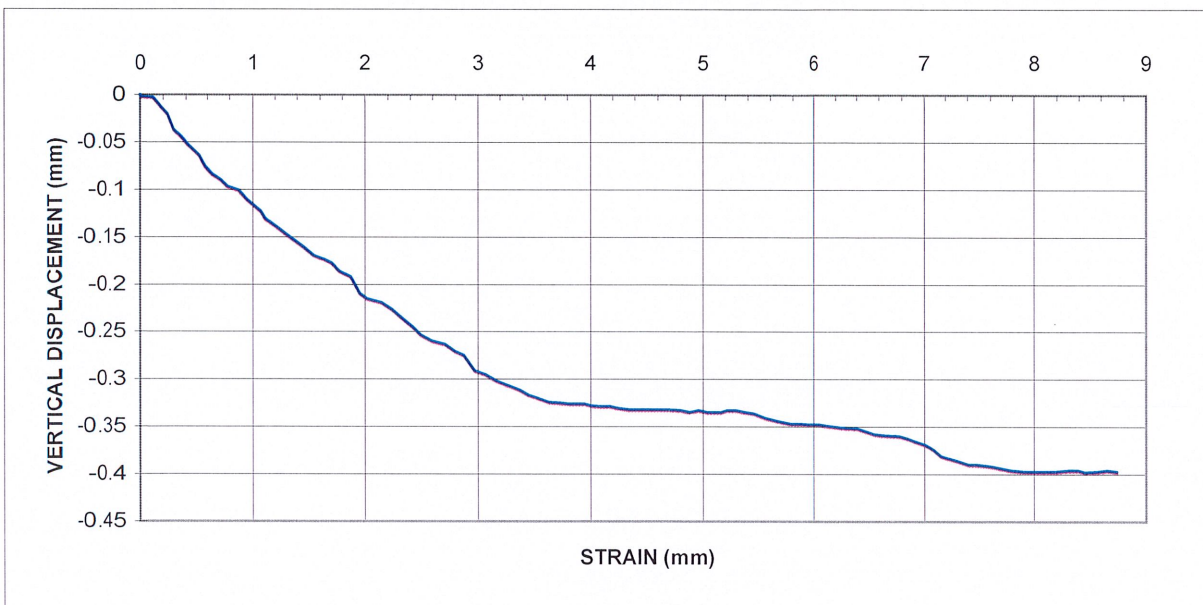
Borehole: MS\BH05

Sample: B30

Depth: 12.45 m.

Stage Number 3

Pressure 330 kPa





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Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No. 4339

Borehole: MS1BH06

Sample: B40

Depth: 8.70 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	23.3	24.3	24.1
Initial Moisture Content	%	21.0	21.0	21.0
Initial Wet density	mg/m ³	1.70	1.72	1.73
Initial Dry density	mg/m ³	1.40	1.43	1.43
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	65	130	260
Height at end of Stage	mm	22.5	23.5	23.1
Duration	Day(s)	1.0	1.0	0.5

SHEARING

Rate of Strain	mm/min	0.320	0.310	0.312
Peak Shear Stress	kPa	25.7	66.5	136.3
Displacement at Peak Stress	mm	7.96	6.15	8.21
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	23.6	23.4	23.4
Final Wet Density	mg/m ³	1.79	1.92	1.84
Final Dry Density	mg/m ³	1.45	1.48	1.49

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	0
Angle of Shearing Resistance phi'	Deg	28°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi'r	Deg	N/A

REMARKS:

DATE TESTED 01/09/2021
 DATE OF ISSUE 10/09/2021

NAME
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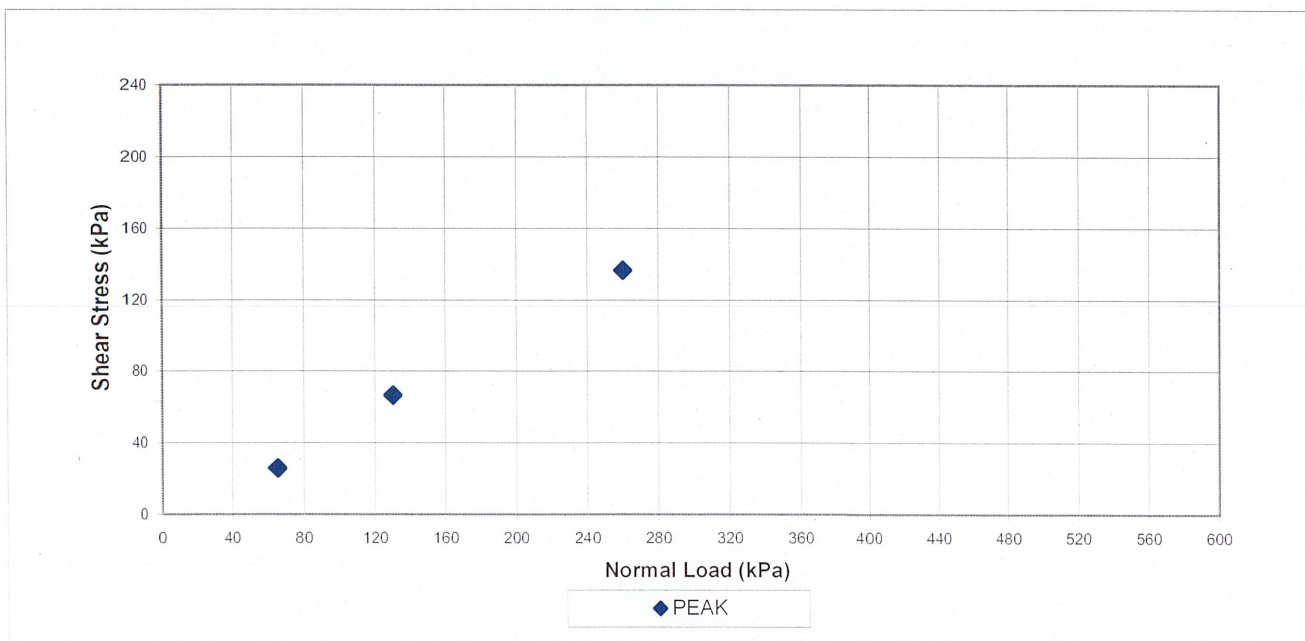
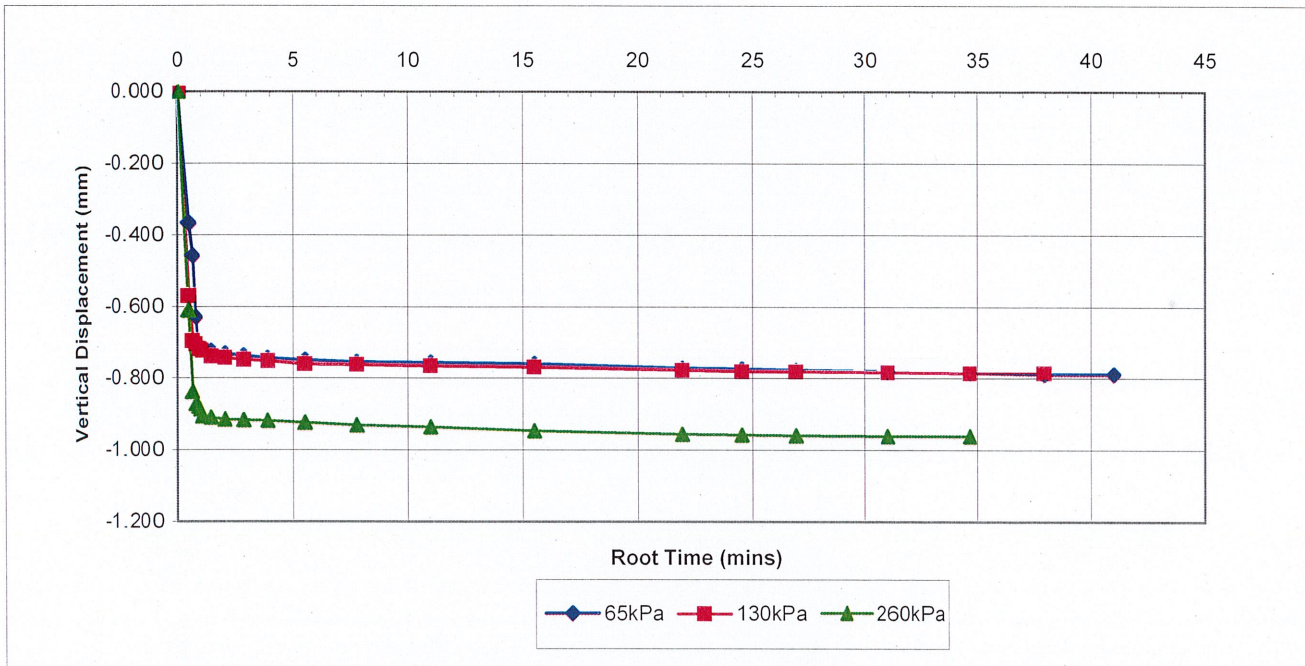
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Borehole: MS\BH06

Sample: B40

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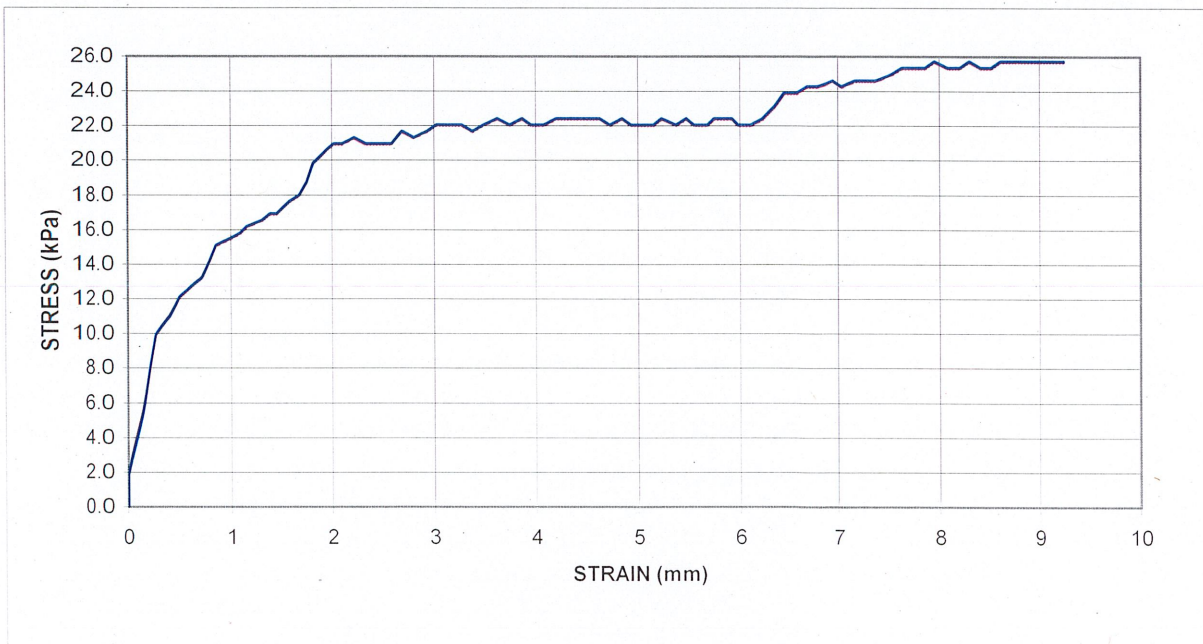
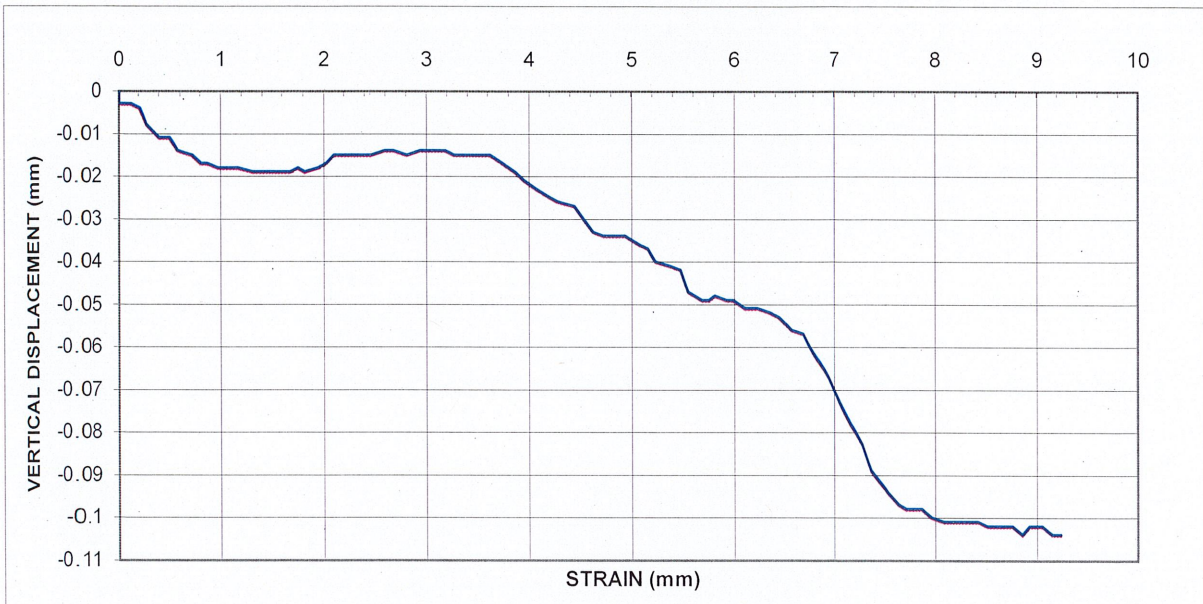
Job No.: 4339

Borehole: MS\BH06

Sample: B40

Depth: 8.70 m.

Stage Number 1 **Pressure** 65 kPa





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Borehole: MS1BH06

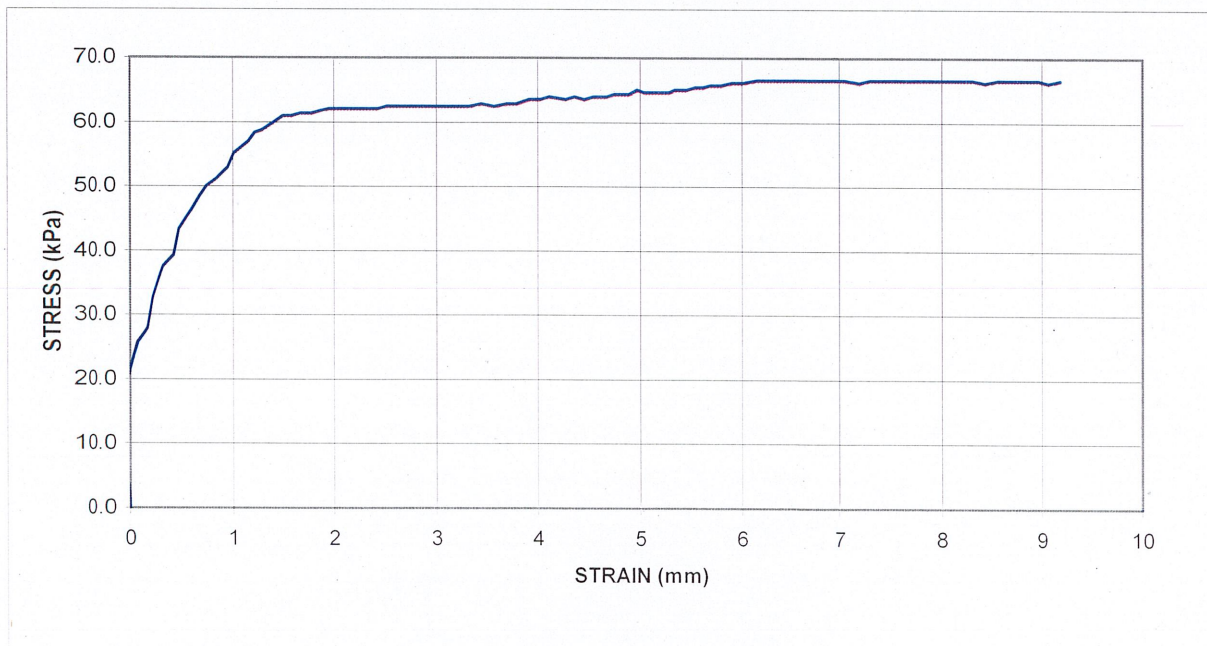
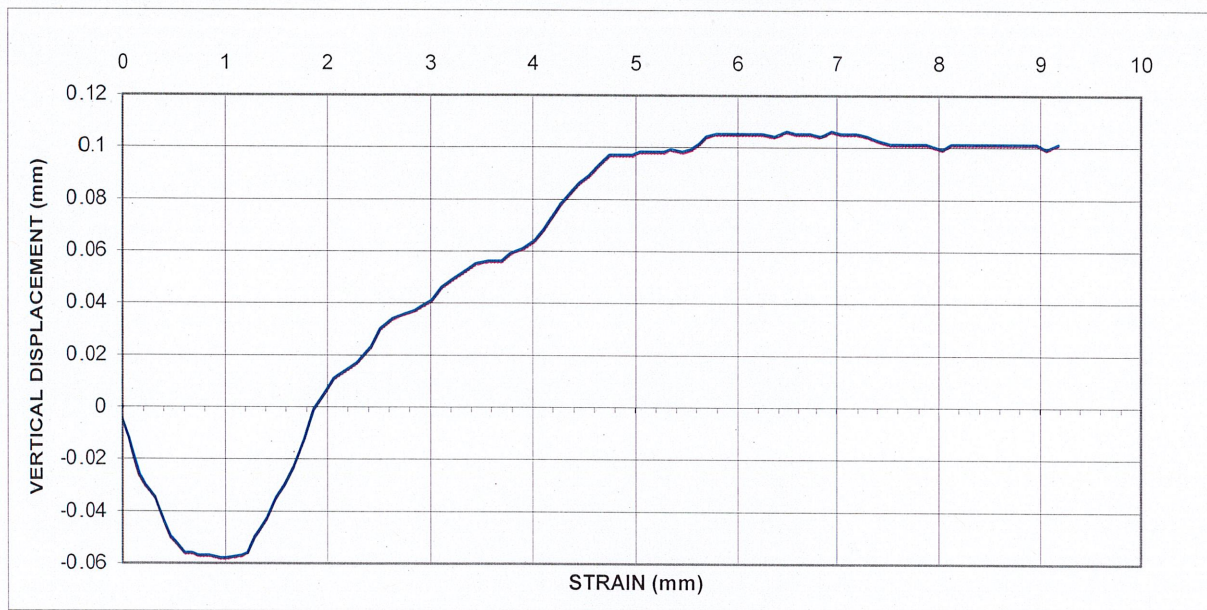
Sample: B40

Depth: 8.70 m.

Stage Number 2

Pressure 130 kPa

130 kPa





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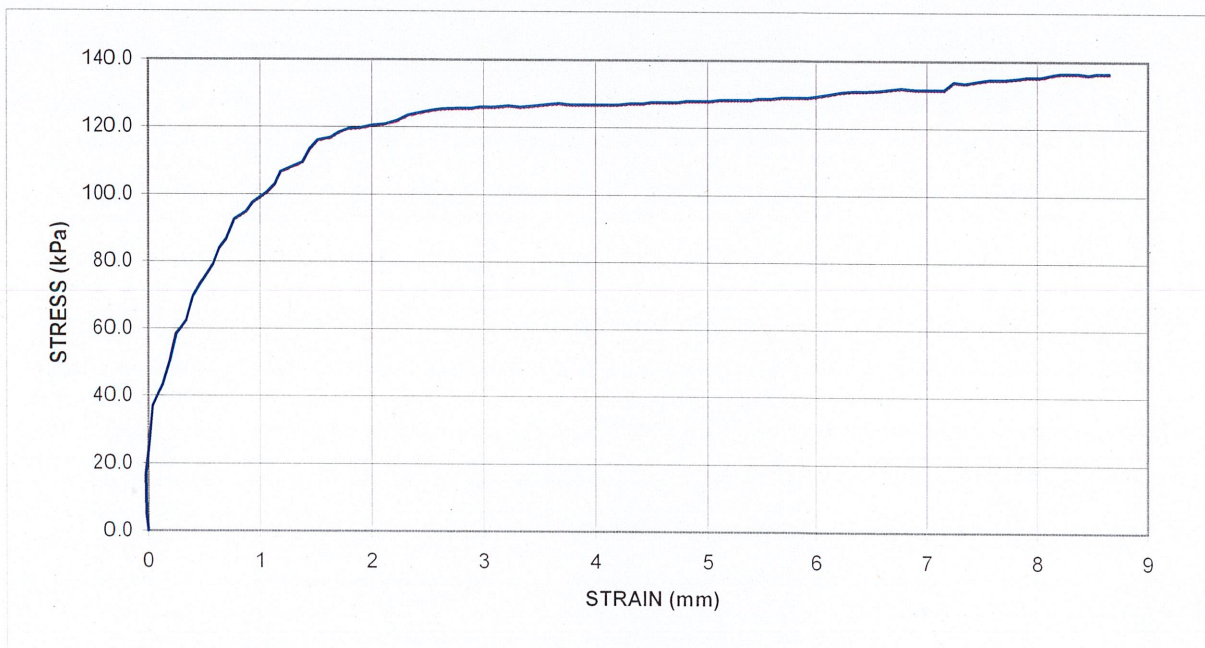
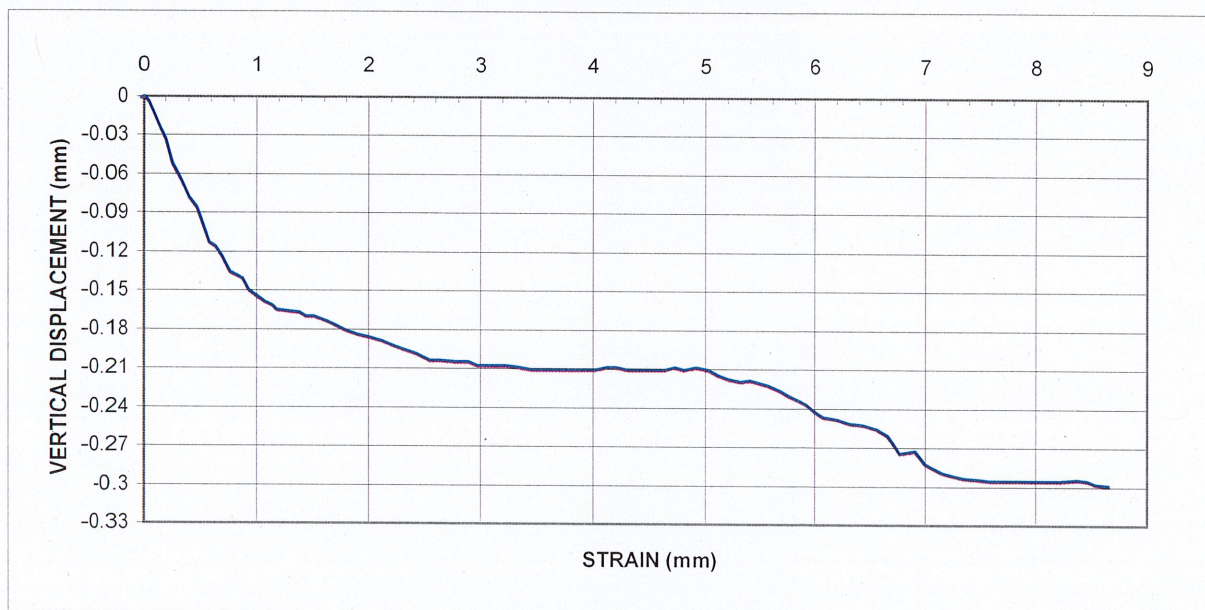
Borehole: MS1BH06

Sample: B40

Depth: 8.70 m.

Stage Number 3

Pressure 260 kPa





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Unit 25 Stella Gill Industrial Estate, Pelton Fell
 Chester-le-Street, Co.Durham. DH2 2RG
 a UKAS LABORATORY Testing No. 1367



1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No: 4339

Borehole: MSIBH07

Sample: B27

Depth: 10.20 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	23.3	24.2	25.2
Initial Moisture Content	%	20.9	20.9	20.9
Initial Wet density	mg/m ³	1.70	1.70	1.72
Initial Dry density	mg/m ³	1.41	1.41	1.42
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	70	145	290
Height at end of Stage	mm	22.9	23.3	24.5
Duration	Day(s)	0.5	0.5	1.0

SHEARING

Rate of Strain	mm/min	0.306	0.309	0.313
Peak Shear Stress	kPa	35.9	87.9	181.0
Displacement at Peak Stress	mm	2.31	3.50	6.02
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	24.3	24.3	24.4
Final Wet Density	mg/m ³	1.78	1.82	1.82
Final Dry Density	mg/m ³	1.43	1.46	1.47

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	0
Angle of Shearing Resistance phi 'r	Deg	31°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

REMARKS:

DATE TESTED 03/09/2021
 DATE OF ISSUE 15/09/2021

NAME Michelle Selkirk
 APPROVED BY [REDACTED]



ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Chester-le-Street, Co.Durham. DH2 2RG
a UKAS LABORATORY Testing No. 1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)



1367

Site: Preliminary Onshore Ground Investigation for NZT

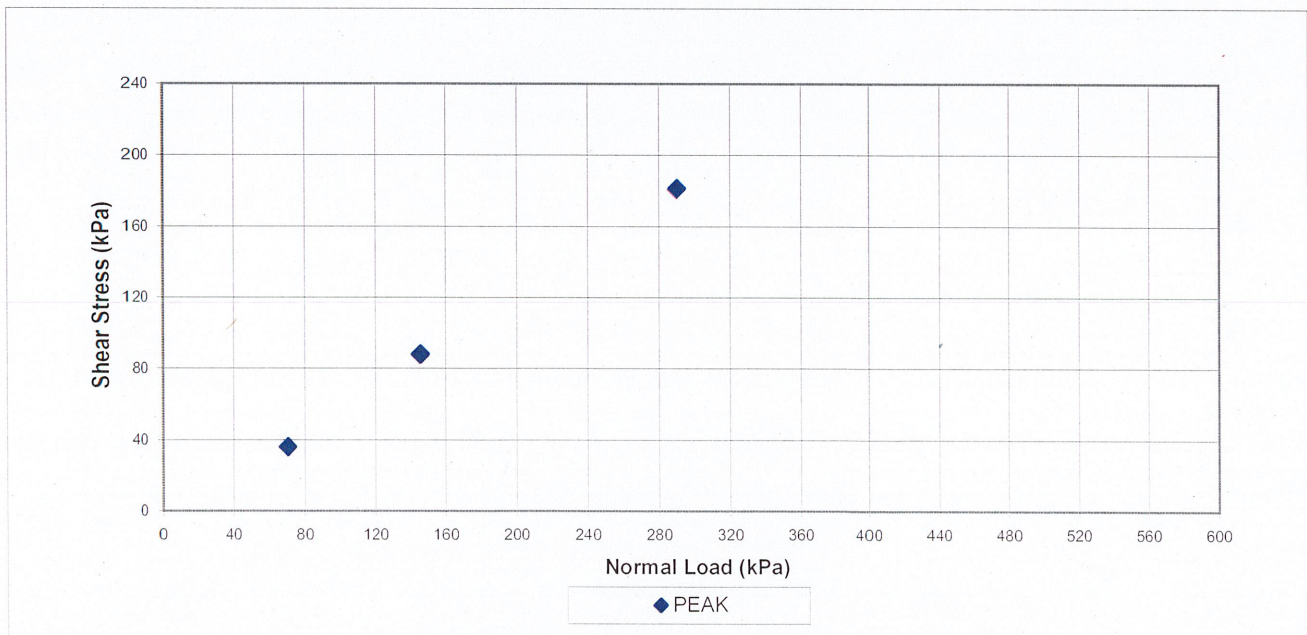
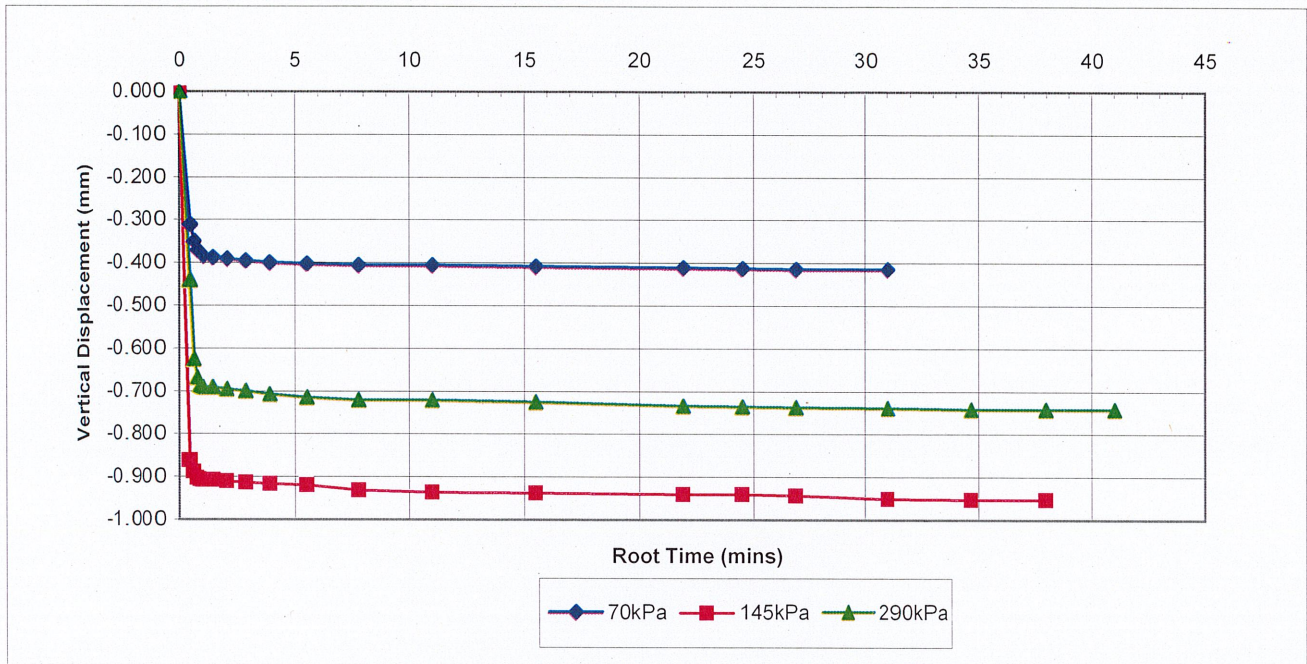
Client: AECOM

Job No: 4339

Borehole: MS\BH07

Sample: B27

Depth: 10.20 m.





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell
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Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No.: 4339

Borehole: MSVBH07

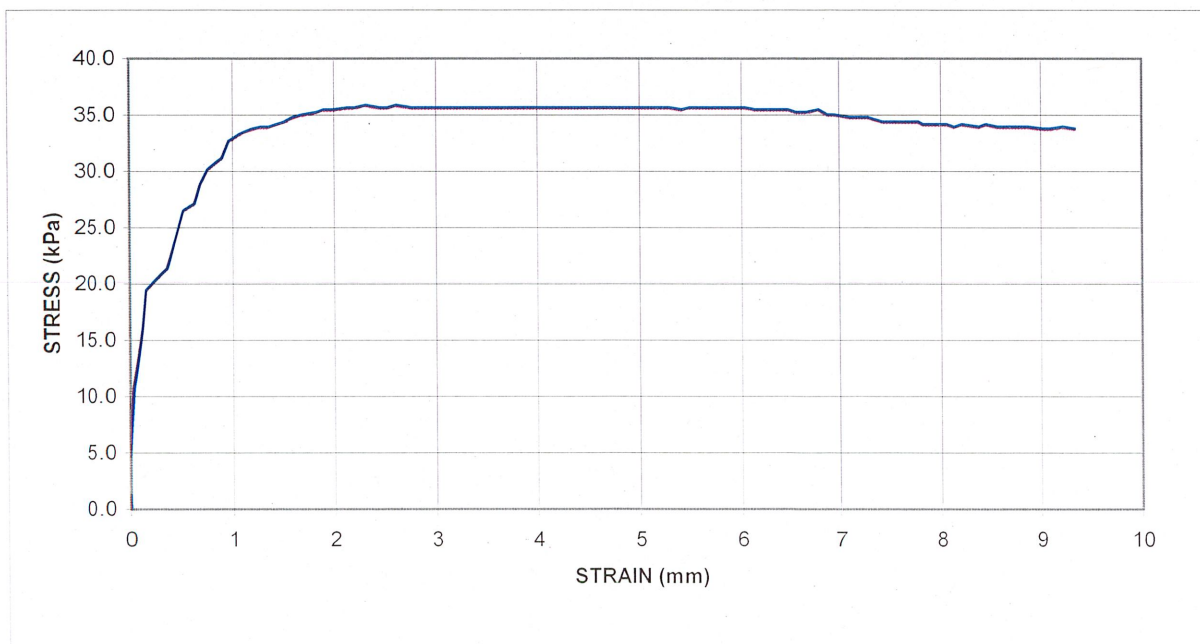
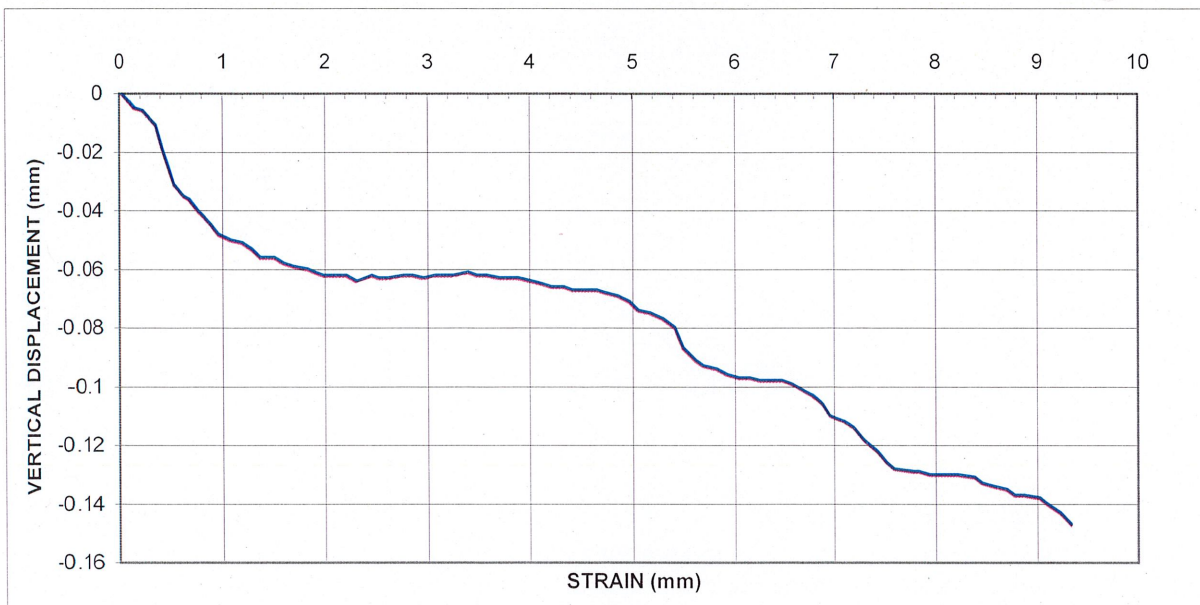
Sample: B27

Depth: 10.20 m.

Stage Number 1

Pressure 70 kPa

70 kPa





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

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 Chester-le-Street, Co.Durham. DH2 2RG
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Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No.: 4339

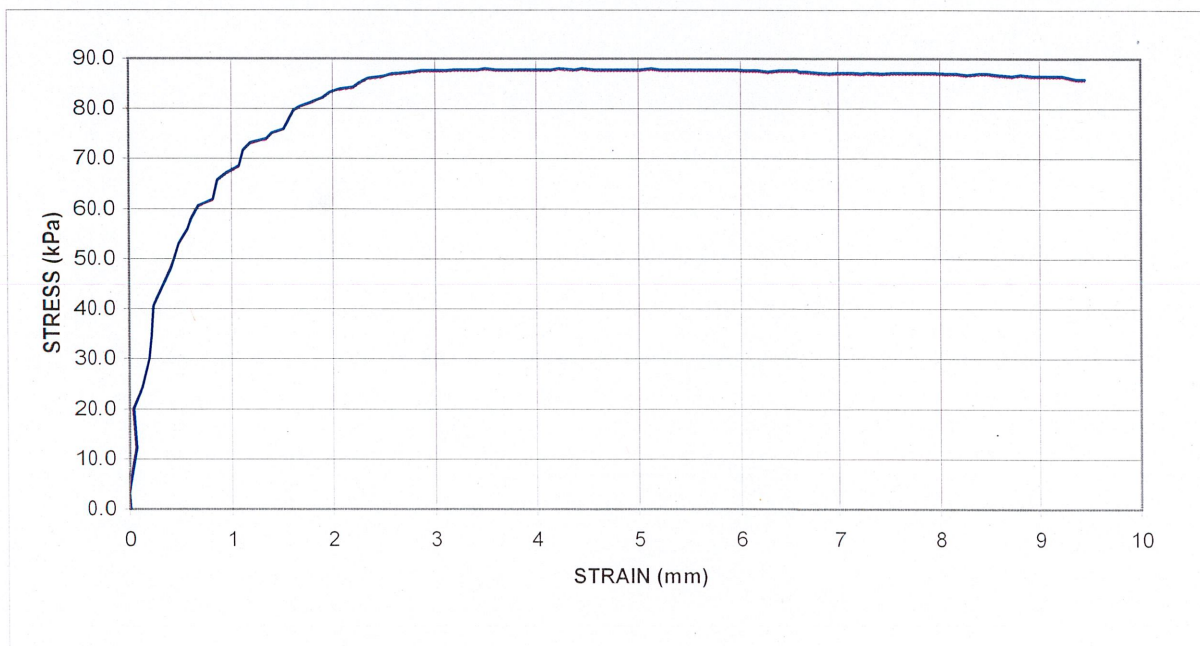
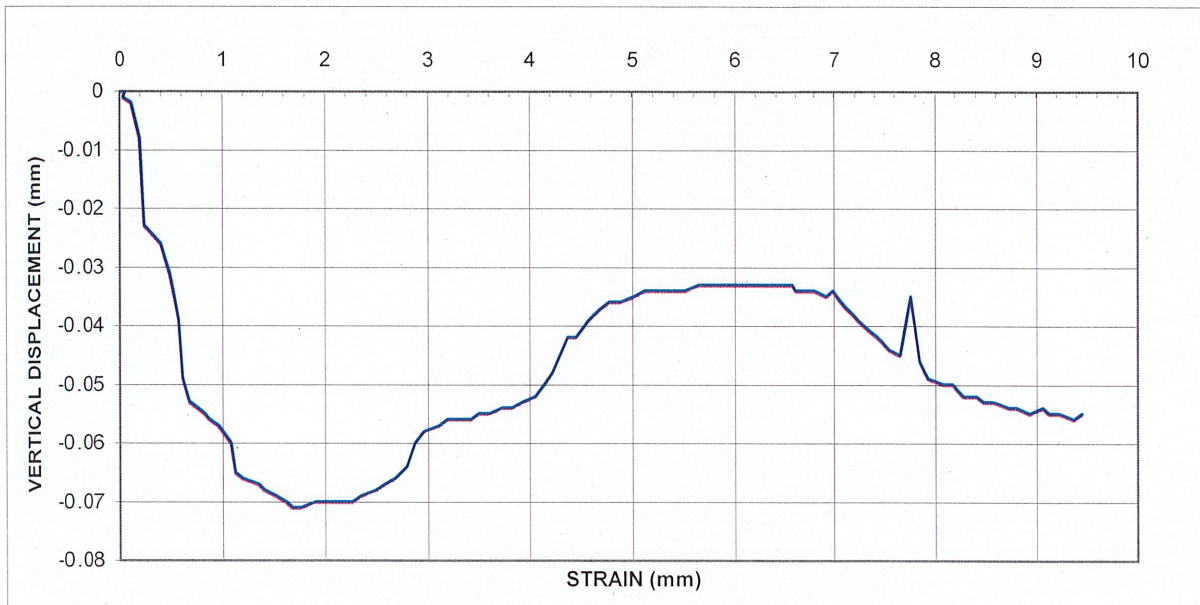
Borehole: MSVBH07

Sample: B27

Depth: 10.20 m.

Stage Number 2

Pressure 145 kPa





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell
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Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No. 4339

Borehole: MS\BH08

Sample: B20

Depth: 5.70 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	24.8	25.1	25.2
Initial Moisture Content	%	15.7	15.7	15.7
Initial Wet density	mg/m ³	1.82	1.79	1.77
Initial Dry density	mg/m ³	1.57	1.54	1.53
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	50	100	200
Height at end of Stage	mm	24.3	24.1	23.9
Duration	Day(s)	0.5	0.5	0.5

SHEARING

Rate of Strain	mm/min	0.248	0.264	0.264
Peak Shear Stress	kPa	14.0	47.0	102.5
Displacement at Peak Stress	mm	2.49	9.25	9.17
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	20.3	20.2	19.9
Final Wet Density	mg/m ³	1.93	1.93	1.93
Final Dry Density	mg/m ³	1.60	1.60	1.61

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	0
Angle of Shearing Resistance phi'	Deg	27°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi'	Deg	N/A

REMARKS:

DATE TESTED 04/10/2021
DATE OF ISSUE 15/10/2021

NAME Michelle Selkirk
APPROVED BY



ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell
 Chester-le-Street, Co.Durham. DH2 2RG
 a UKAS LABORATORY Testing No. 1367



Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

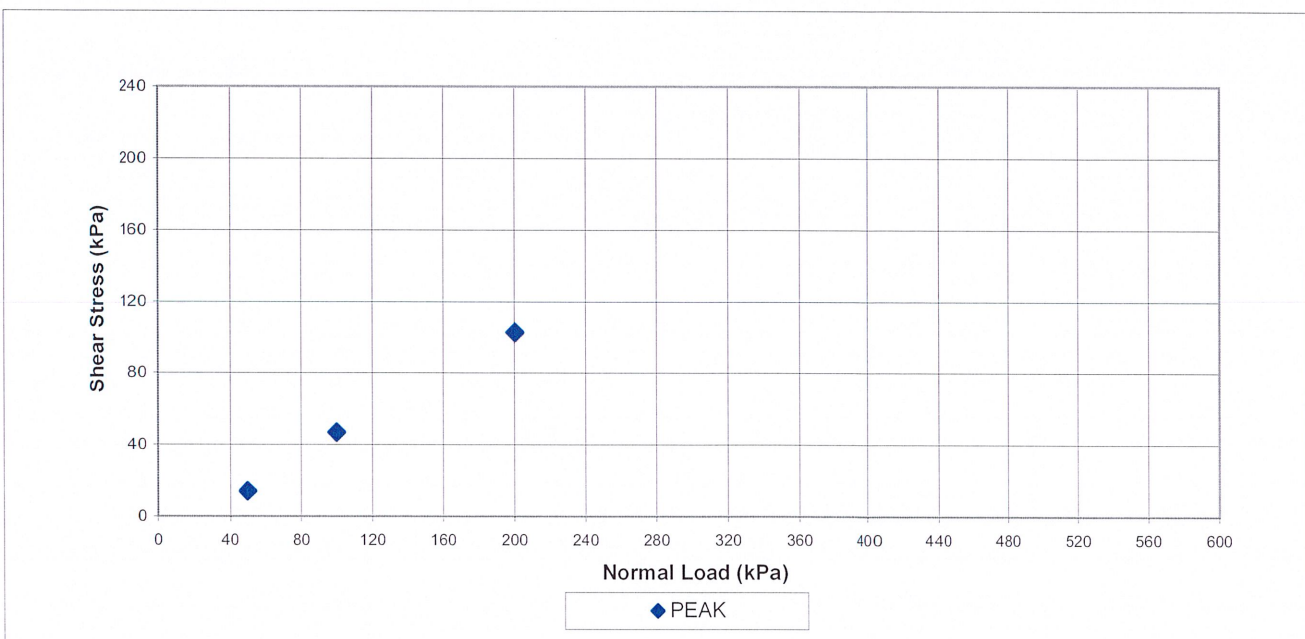
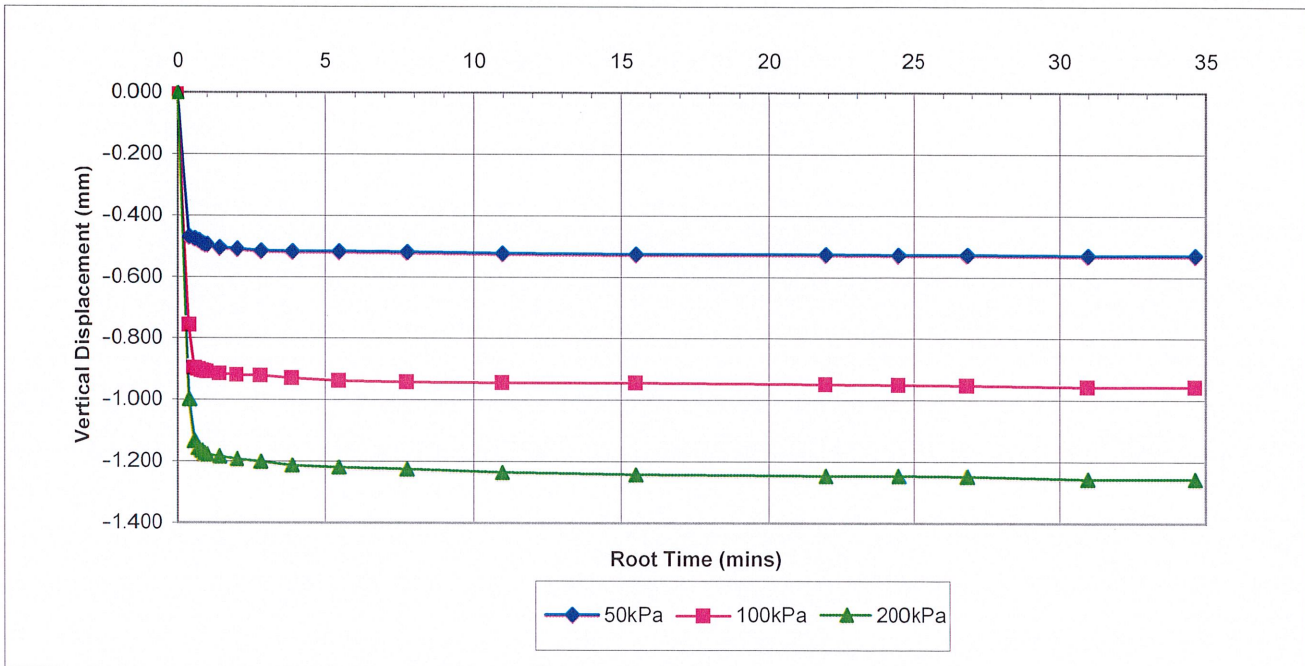
Client: AECOM

Job No. 4339

Borehole: MS\BH08

Sample: B20

Depth: 5.70 m.





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Unit 25 Stella Gill Industrial Estate, Pelton Fell
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Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No.: 4339

Borehole: MS\BH08

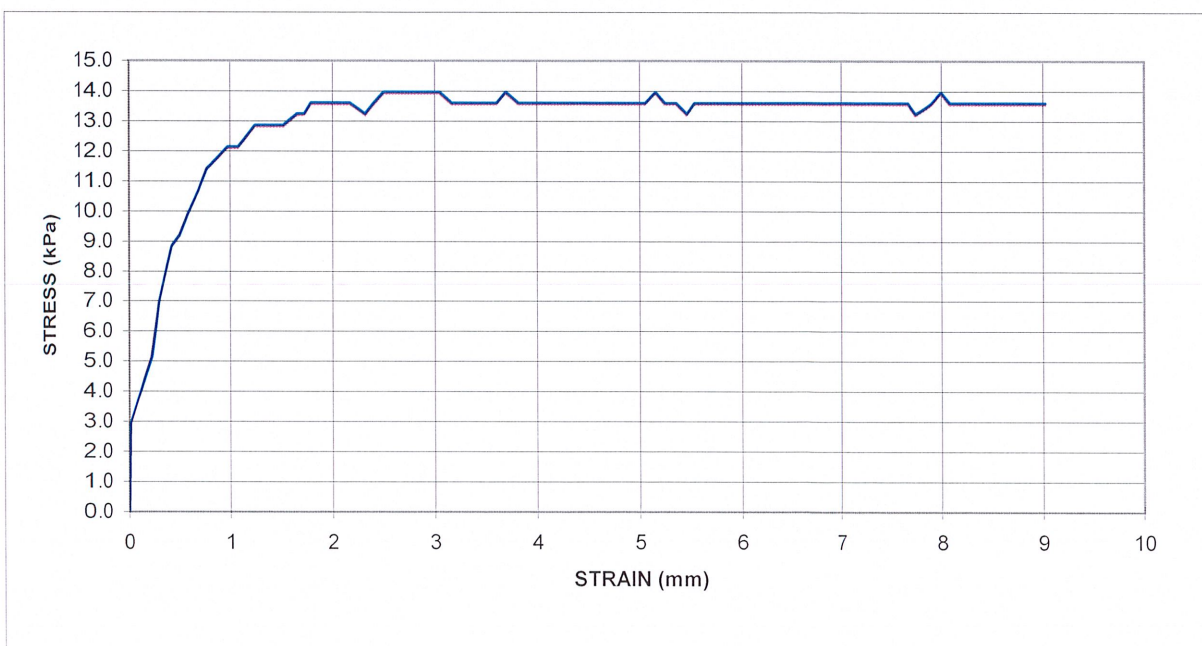
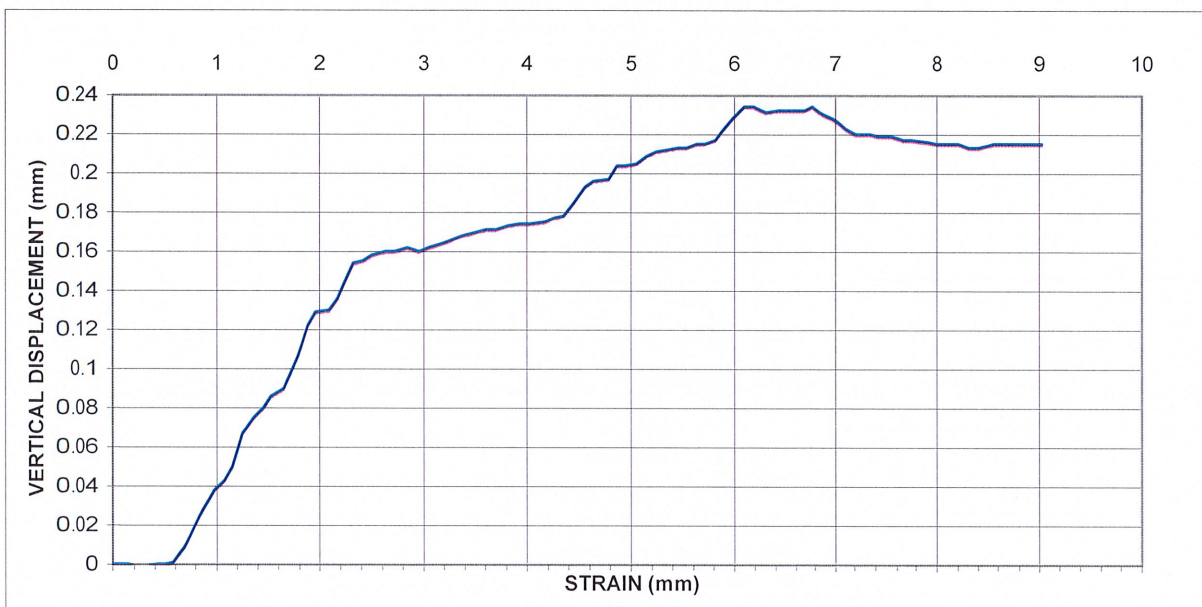
Sample: B20

Depth: 5.70 m.

Stage Number 1

Pressure 50 kPa

50 kPa





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BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No.: 4339

Borehole: MS\BH08

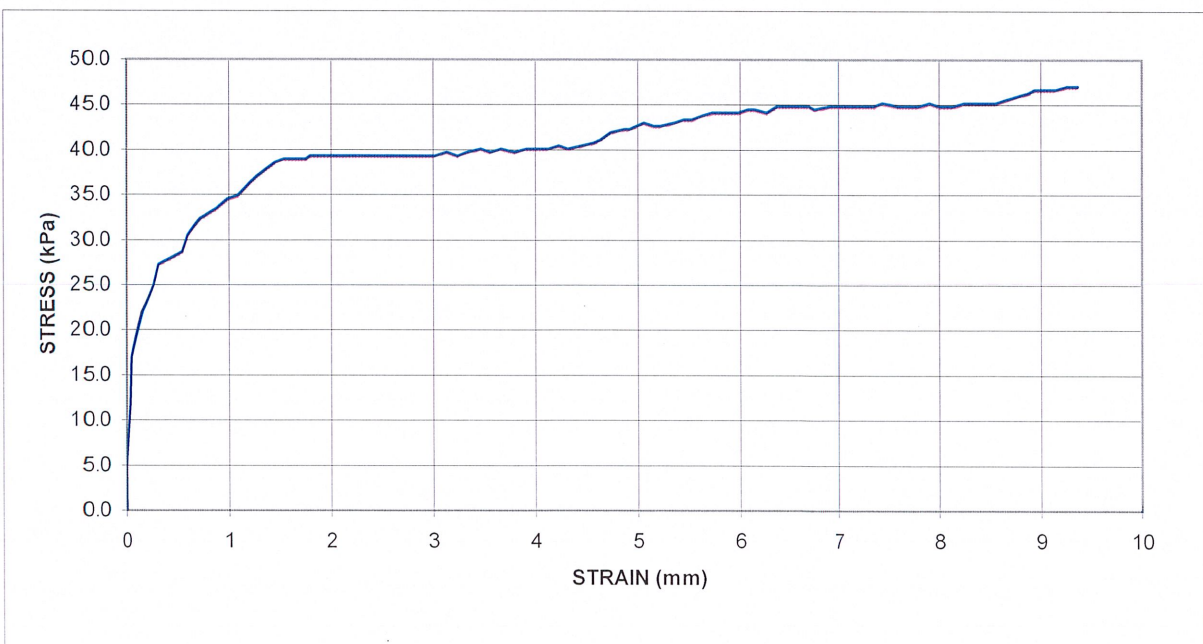
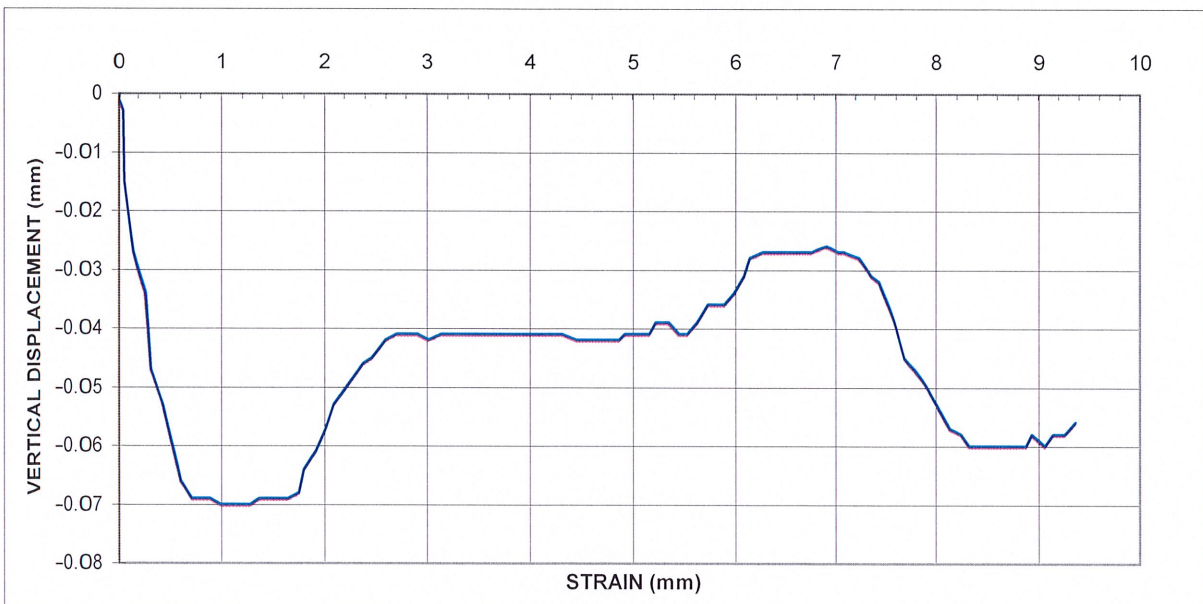
Sample: B20

Depth: 5.70 m.

Stage Number 2

Pressure 100 kPa

100 kPa





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Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No.: 4339

Borehole: MS\BH08

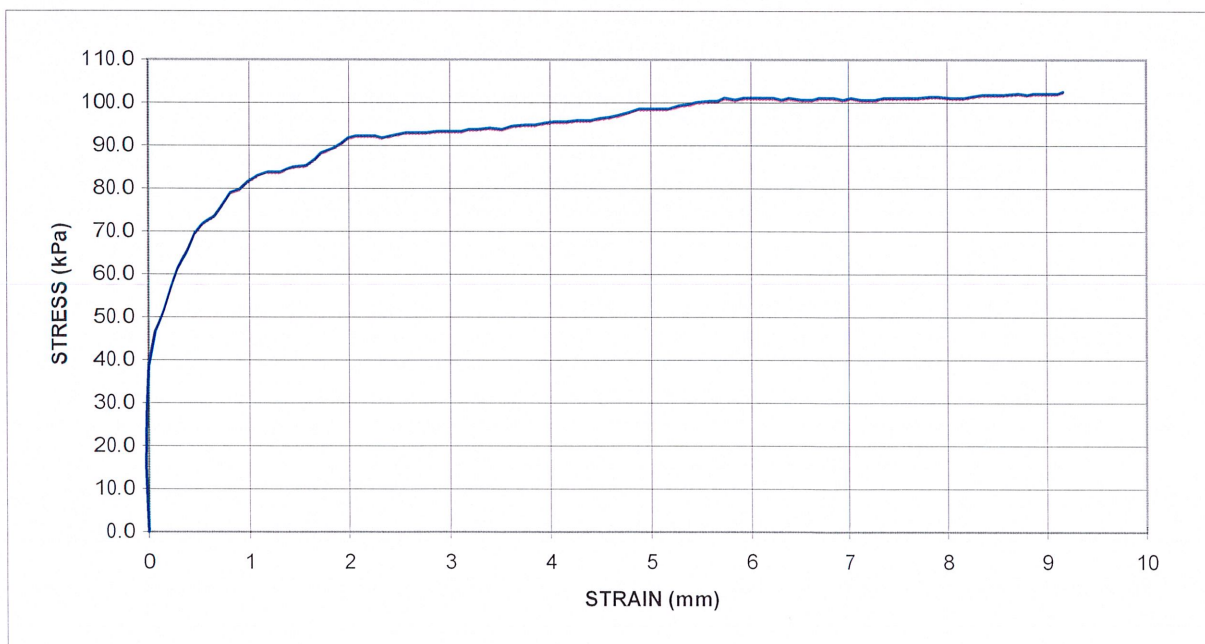
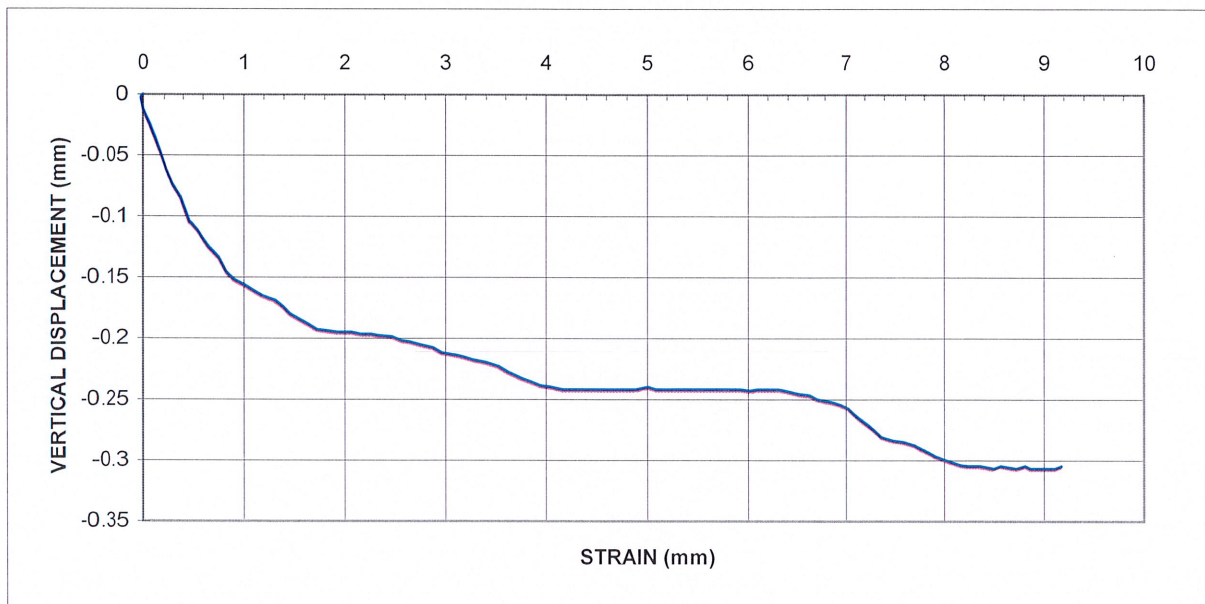
Sample: B20

Depth: 5.70 m.

Stage Number 3

Pressure 200 kPa

200 kPa





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1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No. 4339

Borehole: MS\BH08

Sample: B30

Depth: 9.25 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	21.2	21.7	23.2
Initial Moisture Content	%	27.2	27.2	27.2
Initial Wet density	mg/m ³	2.03	1.99	2.04
Initial Dry density	mg/m ³	1.60	1.57	1.60
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	65	130	270
Height at end of Stage	mm	19.5	19.0	20.5
Duration	Day(s)	1.0	1.0	1.0

SHEARING

Rate of Strain	mm/min	0.038	0.037	0.038
Peak Shear Stress	kPa	30.5	65.9	125.0
Displacement at Peak Stress	mm	3.74	7.59	7.51
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	20.9	19.3	18.9
Final Wet Density	mg/m ³	2.09	2.14	2.16
Final Dry Density	mg/m ³	1.73	1.79	1.82

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	3
Angle of Shearing Resistance phi 'r	Deg	25°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

REMARKS:

DATE TESTED 07/10/2021

DATE OF ISSUE 18/10/2021

NAME

Michelle Selkirk

APPROVED BY





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell
Chester-le-Street, Co.Durham. DH2 2RG
a UKAS LABORATORY Testing No. 1367



Consolidated Drained Shear Box Test BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

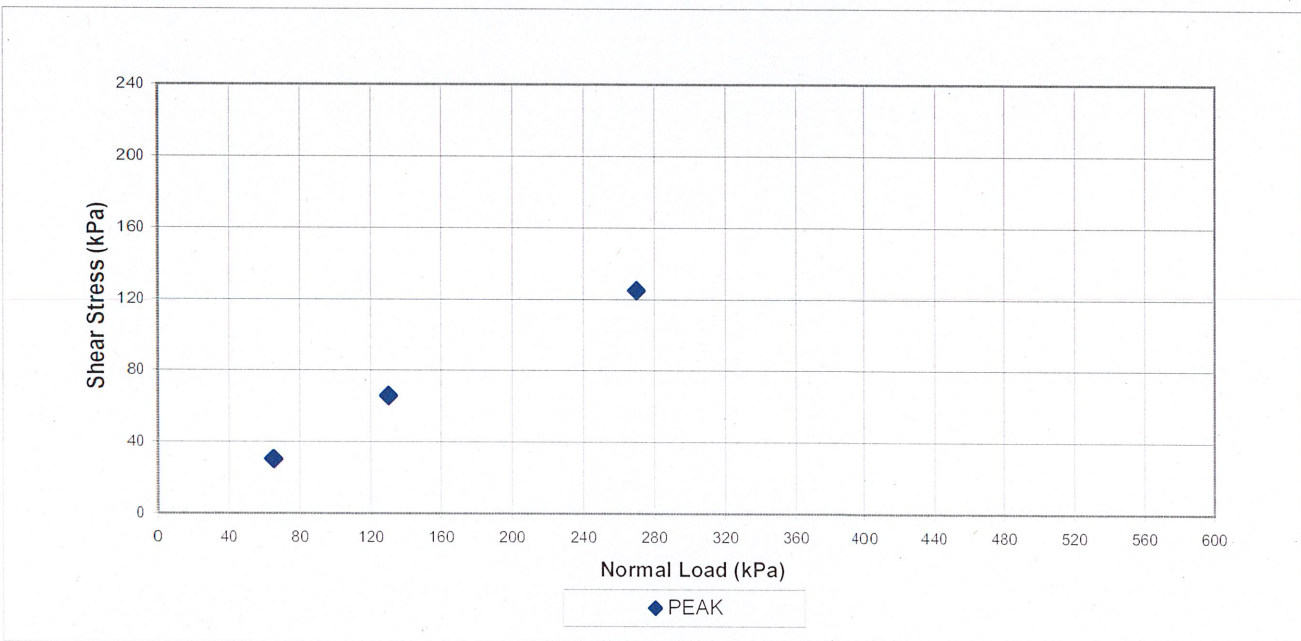
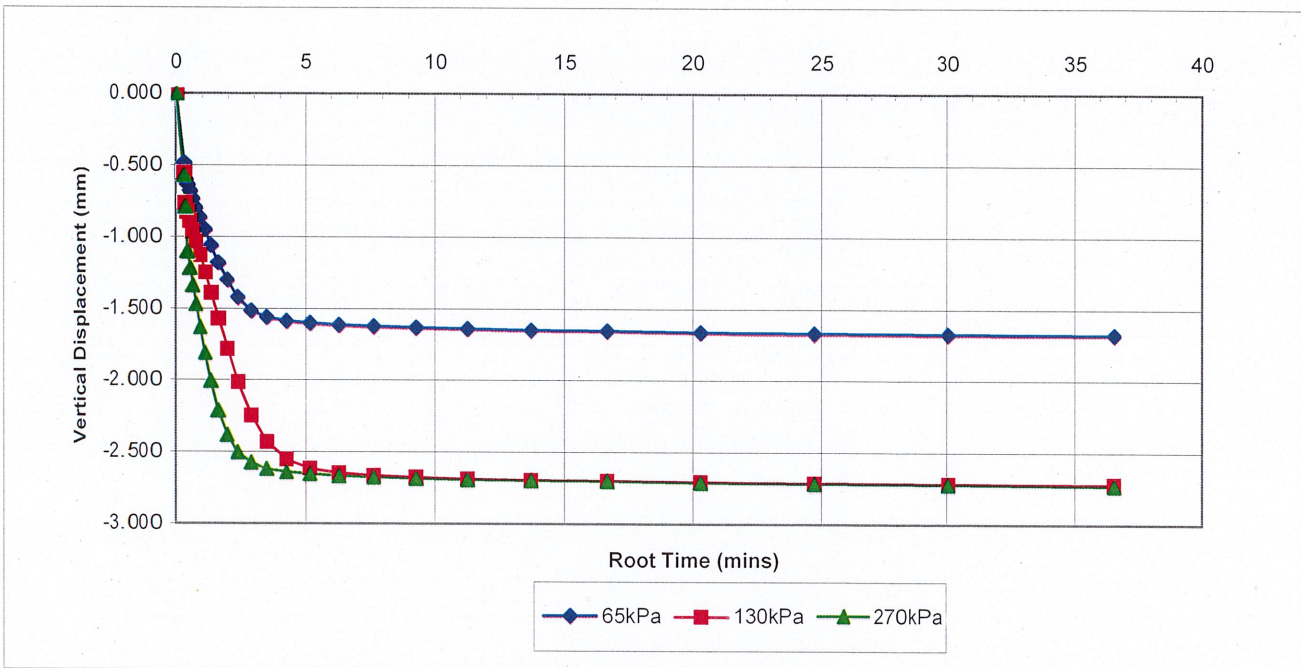
Client: AECOM

Job No. 4339

Borehole: MS\BH08

Sample: B30

Depth: 9.25 m.





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell
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1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No.: 4339

Borehole: MS\BH08

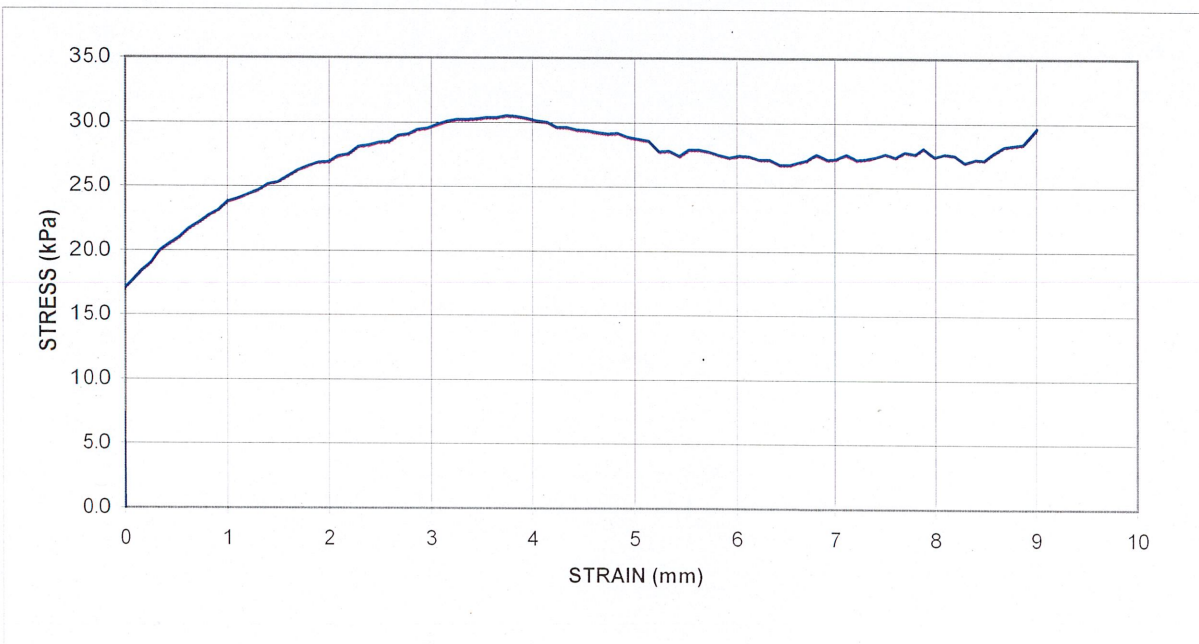
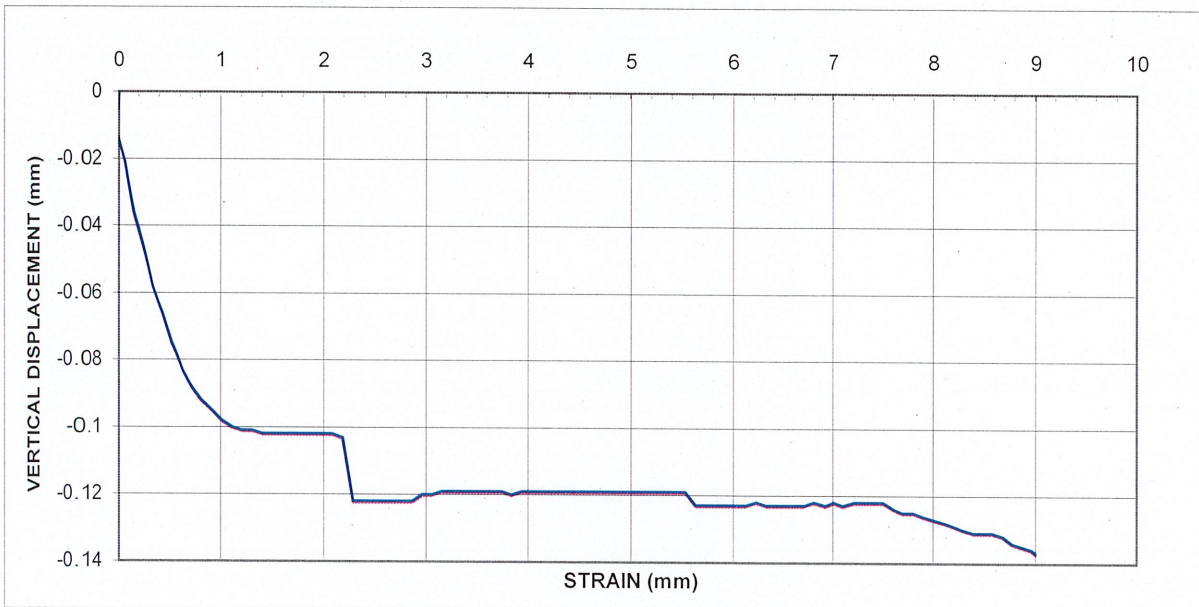
Sample: B30

Depth: 9.25 m.

Stage Number 1

Pressure 65 kPa

65 kPa





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Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

1367

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT
Client: AECOM

Job No.: 4339

Borehole: MSBH08

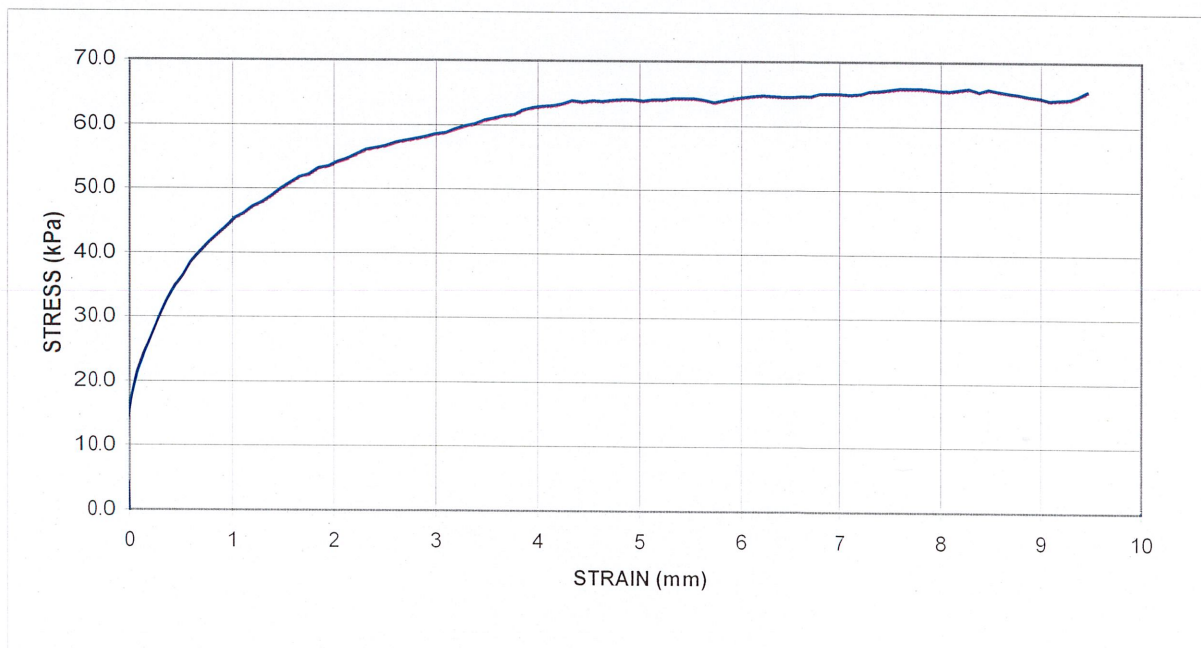
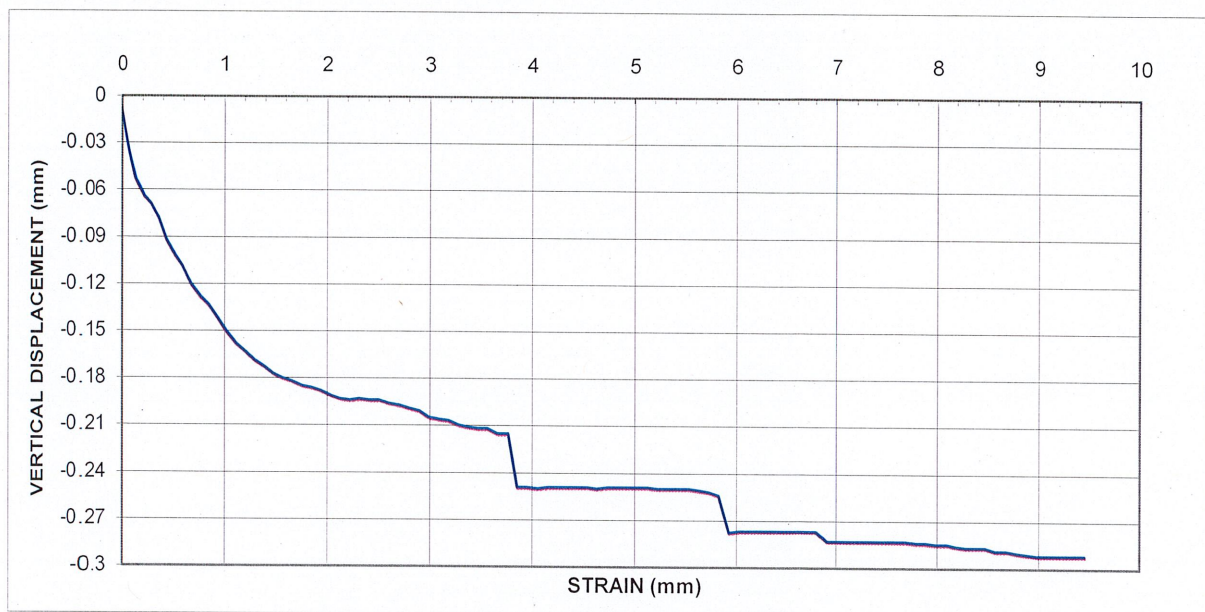
Sample: B30

Depth: 9.25 m.

Stage Number 2

Pressure 130 kPa

130 kPa





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Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

1367

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT
Client: AECOM

Job No.: 4339

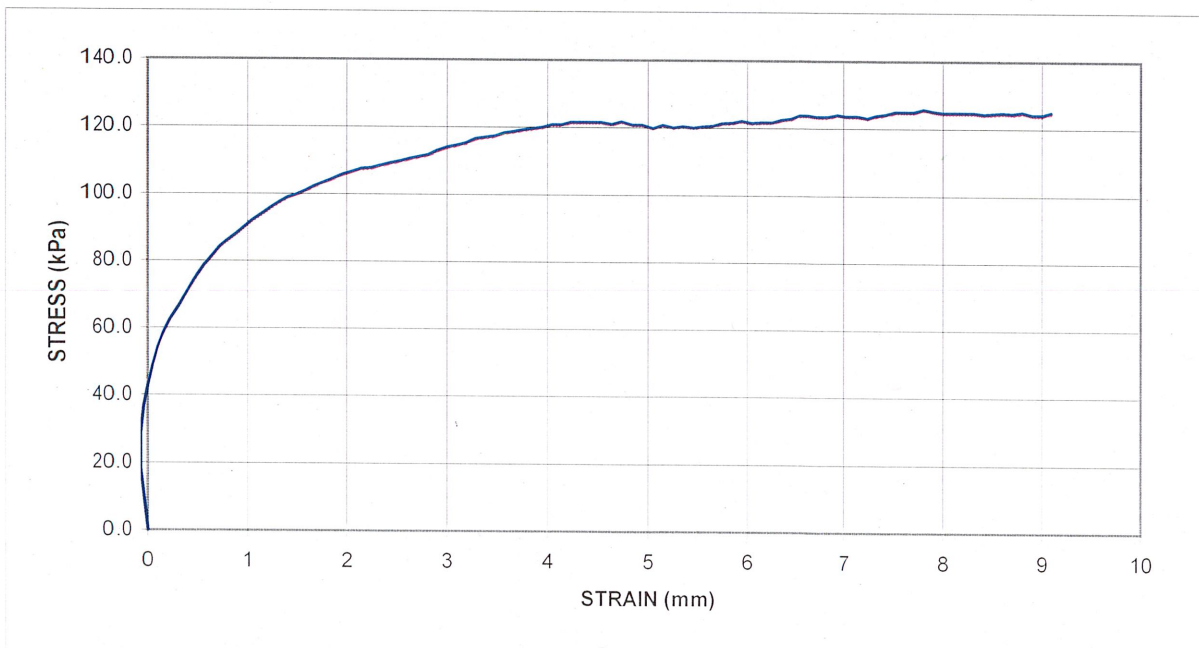
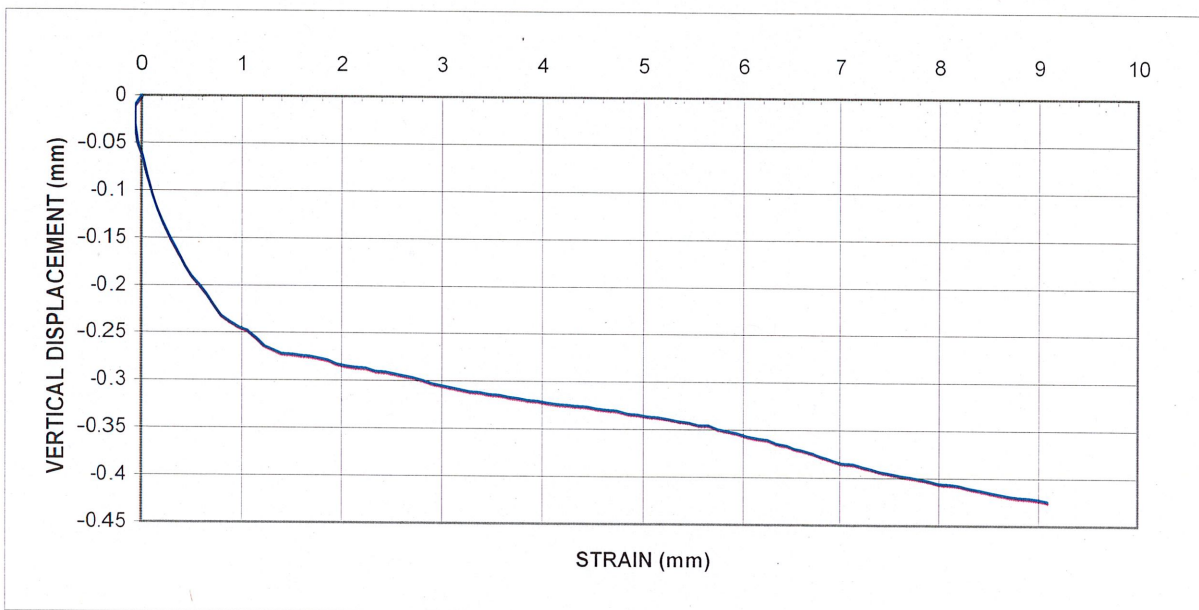
Borehole: MS\BH08

Sample: B30

Depth: 9.25 m.

Stage Number 3

Pressure 270 kPa





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

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1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No: 4339

Borehole: MS\BH13

Sample: B27

Depth: 7.20 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	24.0	24.2	24.6
Initial Moisture Content	%	19.9	19.9	19.9
Initial Wet density	mg/m ³	1.65	1.67	1.65
Initial Dry density	mg/m ³	1.38	1.39	1.38
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	65	130	260
Height at end of Stage	mm	23.4	23.6	23.8
Duration	Day(s)	0.5	0.5	1.0

SHEARING

Rate of Strain	mm/min	0.245	0.252	0.250
Peak Shear Stress	kPa	30.3	68.7	152.4
Displacement at Peak Stress	mm	2.99	6.48	5.75
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	24.8	24.3	24.5
Final Wet Density	mg/m ³	1.76	1.77	1.78
Final Dry Density	mg/m ³	1.41	1.43	1.43

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	0
Angle of Shearing Resistance phi'	Deg	30°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi'r	Deg	N/A

REMARKS:

DATE TESTED 06/10/2021

DATE OF ISSUE 15/10/2021

NAME

Michelle Selkirk

APPROVED BY





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Chester-le-Street, Co.Durham. DH2 2RG
 a UKAS LABORATORY Testing No. 1367

Consolidated Drained Shear Box Test BS 1377 : PART 7 : 1990 Clause 4 (Specimen(s) Tested Submerged)



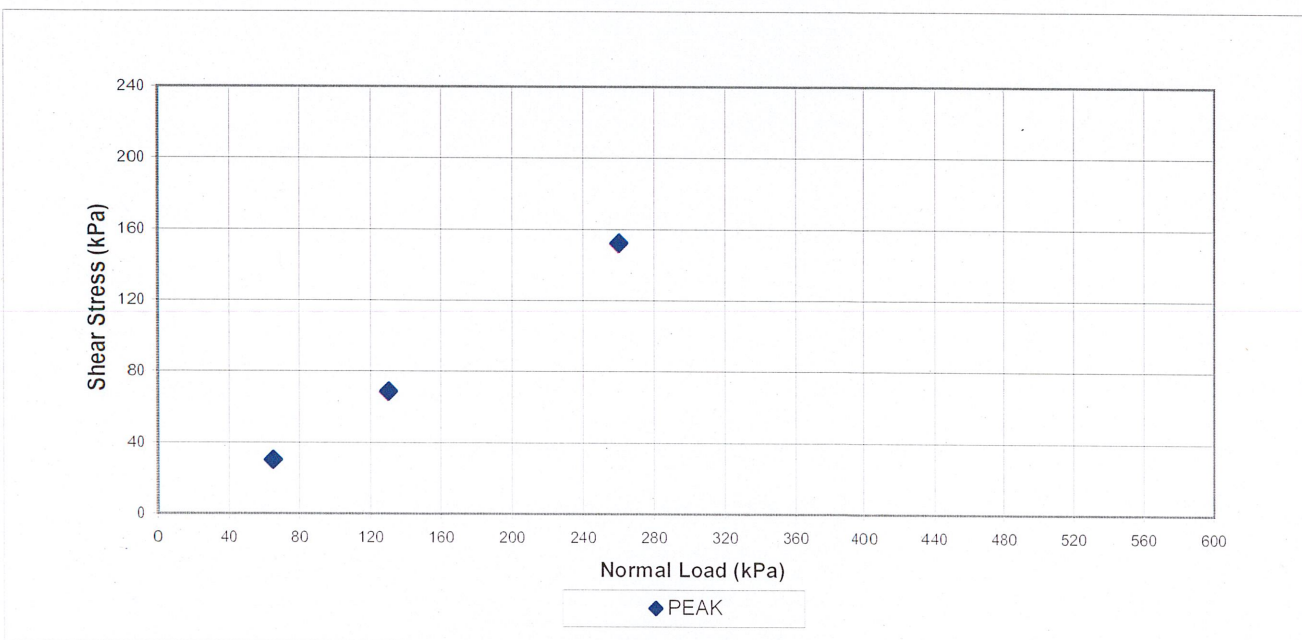
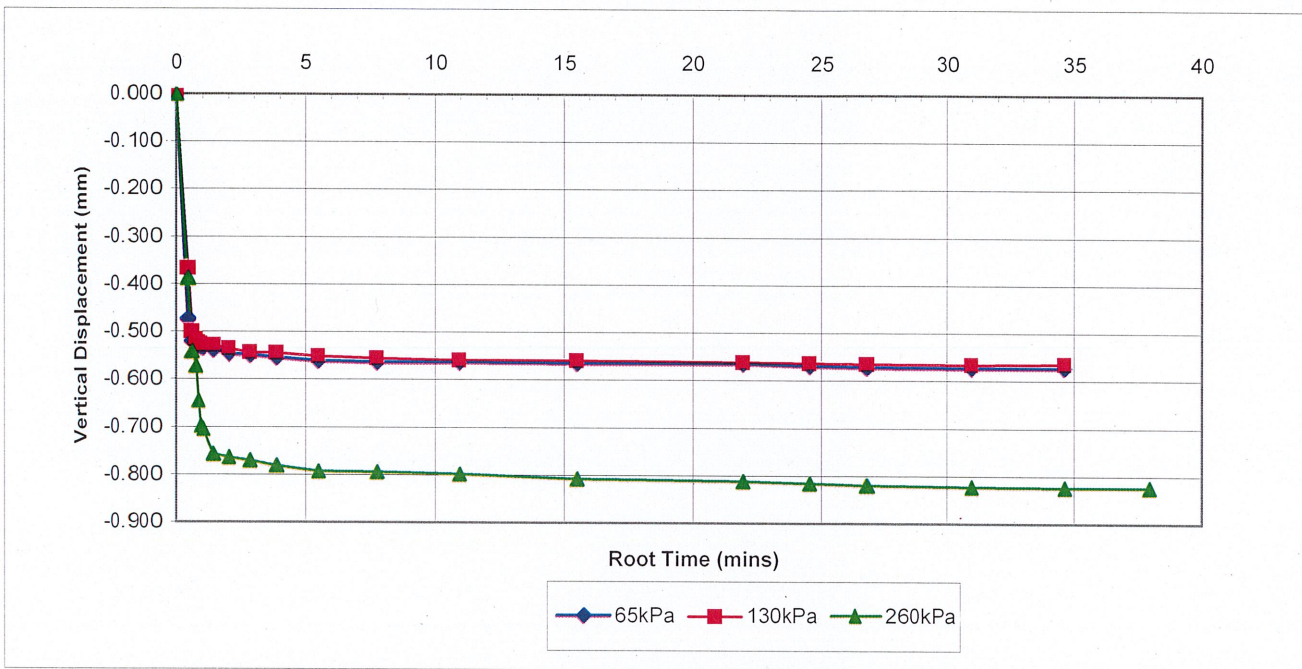
Site: Preliminary Onshore Ground Investigation for NZT
Client: AECOM

Job No: 4339

Borehole: MS\BH13

Sample: B27

Depth: 7.20 m.





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell
 Chester-le-Street, Co.Durham. DH2 2RG
 a UKAS LABORATORY Testing No. 1367



Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4
 (Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT
Client: AECOM

Job No.: 4339

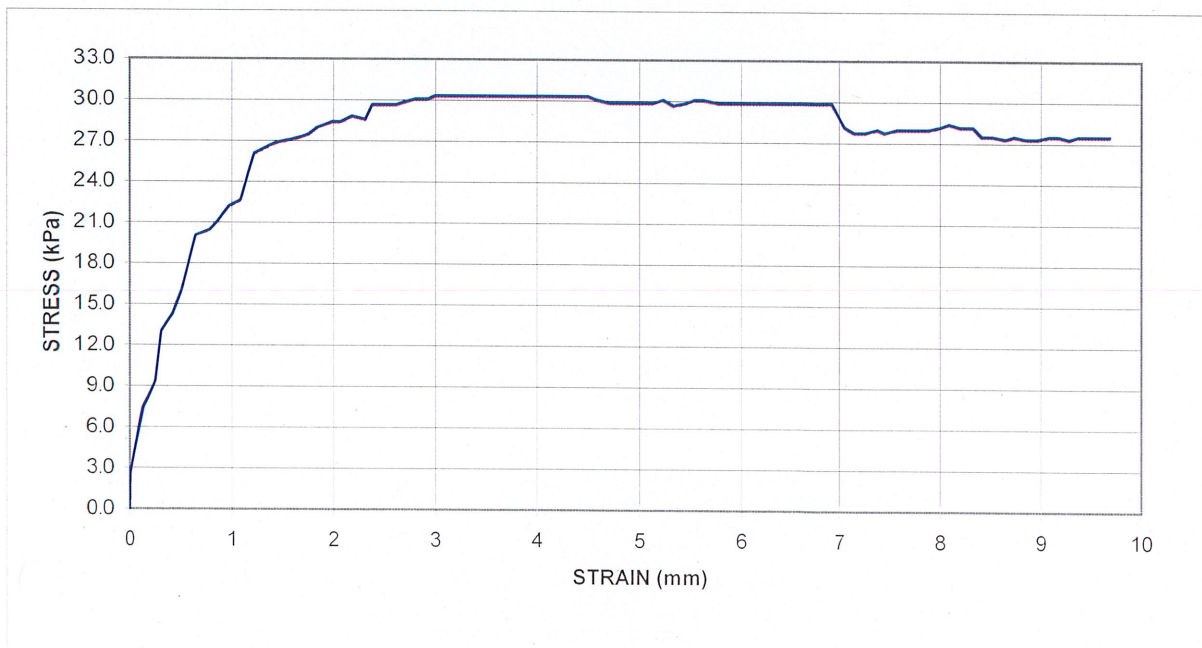
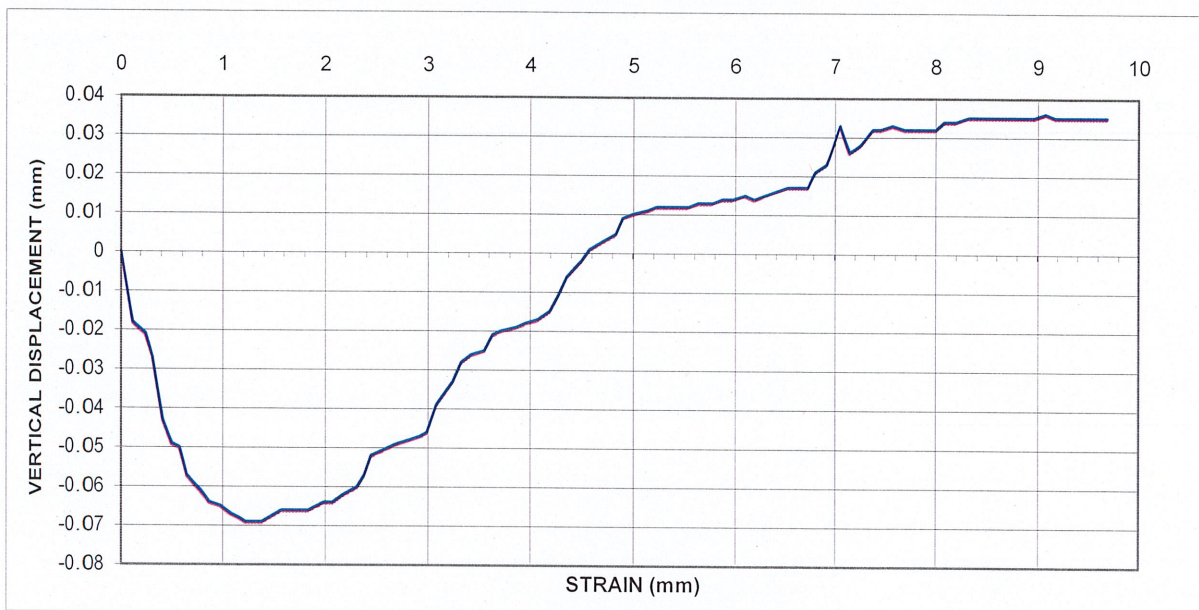
Borehole: MS\BH13

Sample: B27

Depth: 7.20 m.

Stage Number 1

Pressure 65 kPa





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

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1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4
 (Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT
Client: AECOM

Job No.: 4339

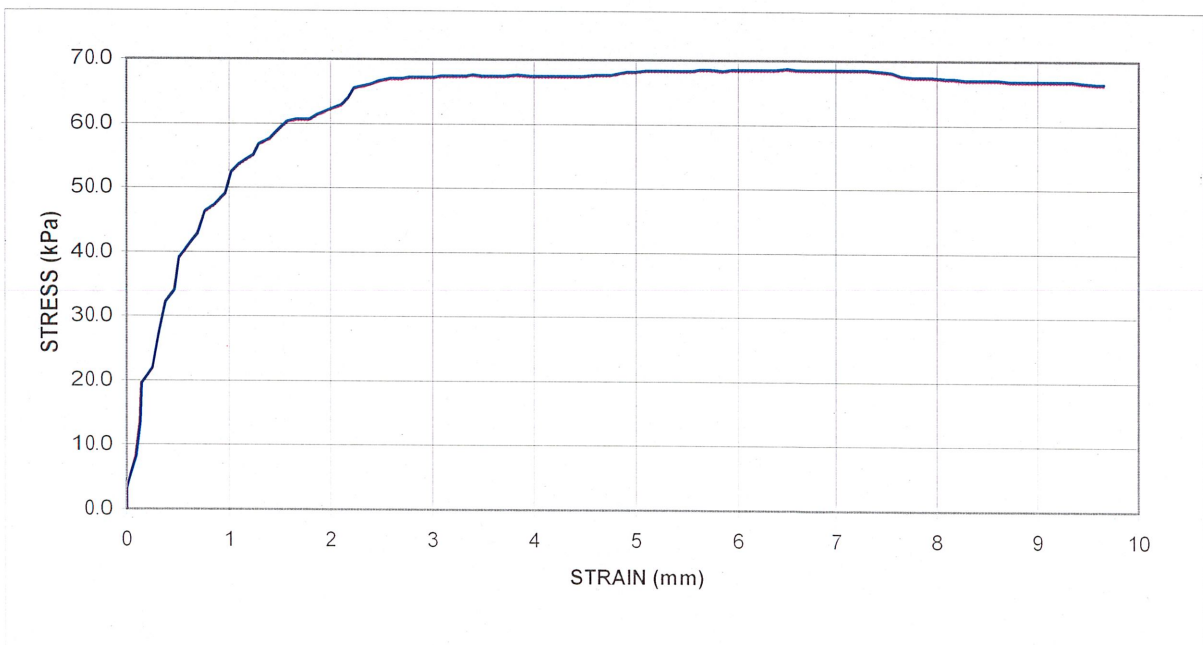
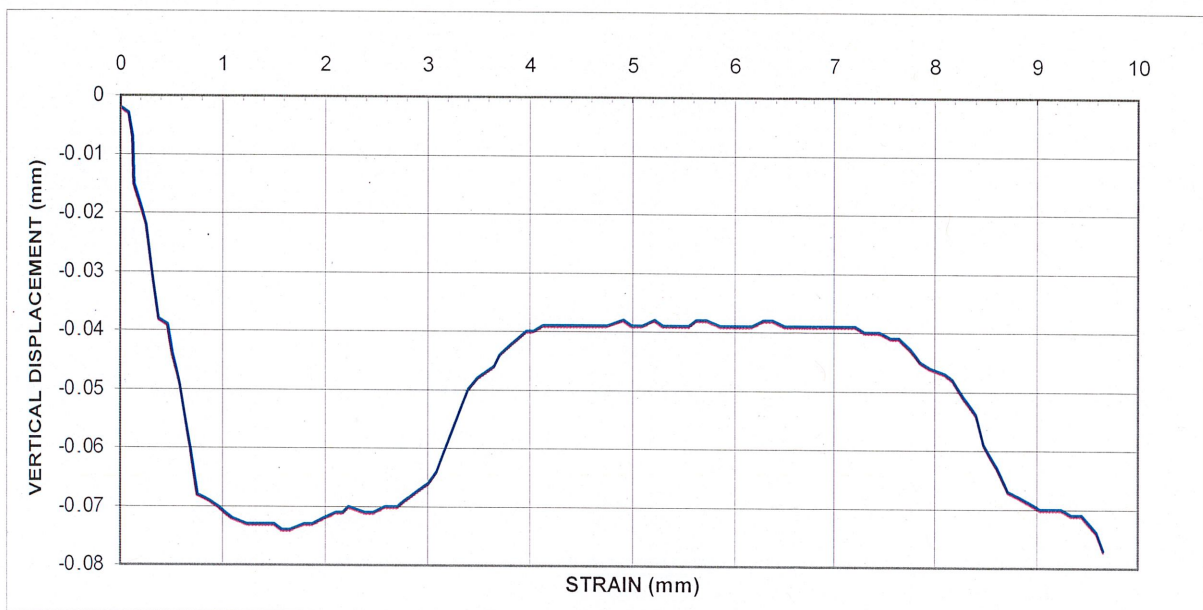
Borehole: MS\BH13

Sample: B27

Depth: 7.20 m.

Stage Number 2

Pressure 130 kPa





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

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Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

Site: Preliminary Onshore Ground Investigation for NZT
Client: AECOM

Job No.: 4339

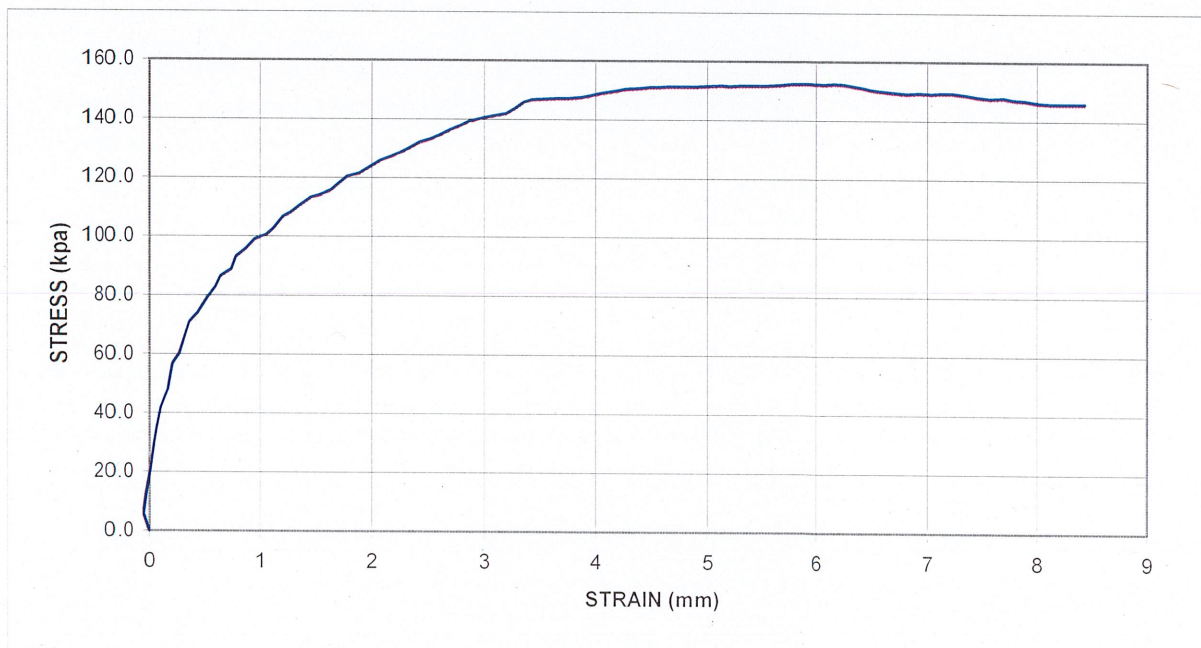
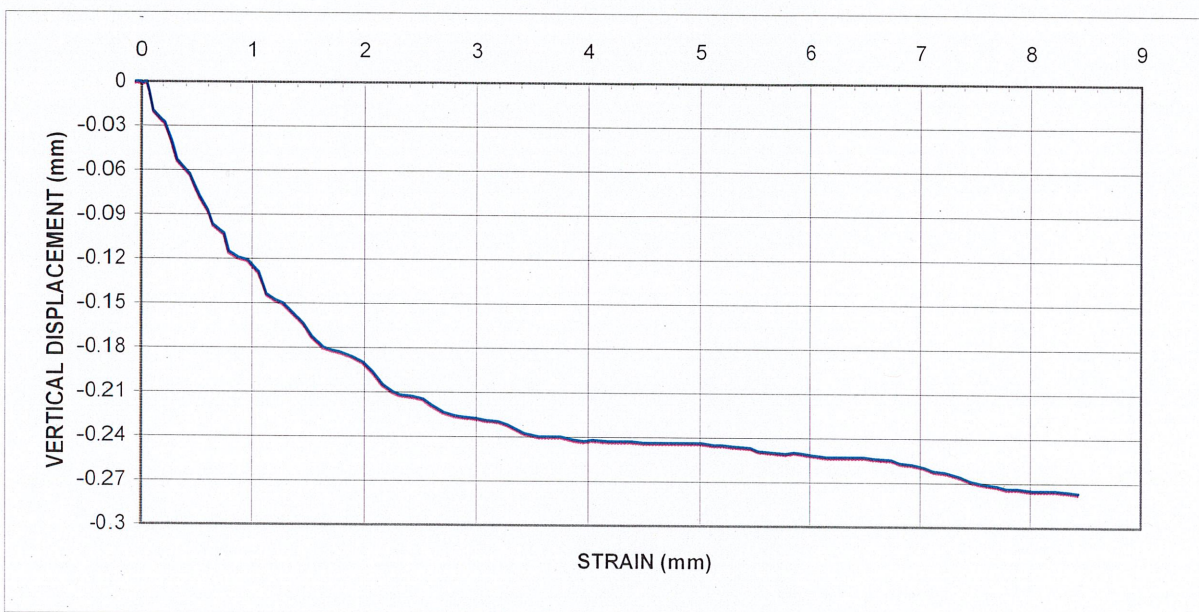
Borehole: MS\BH13

Sample: B27

Depth: 7.20 m.

Stage Number 3

Pressure 260 kPa





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

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 a UKAS LABORATORY Testing No. 1367



1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No: 4339

Borehole: MS\BH14

Sample: B32

Depth: 8.70 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	23.8	24.9	24.5
Initial Moisture Content	%	25.6	25.6	25.6
Initial Wet density	mg/m ³	1.80	1.74	1.80
Initial Dry density	mg/m ³	1.43	1.39	1.44
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	65	130	260
Height at end of Stage	mm	23.2	24.3	24.0
Duration	Day(s)	0.5	0.5	0.5

SHEARING

Rate of Strain	mm/min	0.246	0.244	0.246
Peak Shear Stress	kPa	42.7	80.9	172.2
Displacement at Peak Stress	mm	2.26	3.10	3.10
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	24.2	24.7	23.9
Final Wet Density	mg/m ³	1.82	1.77	1.81
Final Dry Density	mg/m ³	1.47	1.42	1.46

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	0
Angle of Shearing Resistance phi 'r	Deg	33°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

REMARKS:

DATE TESTED 14/09/2021
 DATE OF ISSUE 29/09/2021

NAME
 APPROVED BY

Michelle Selkirk



ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Chester-le-Street, Co.Durham. DH2 2RG
a UKAS LABORATORY Testing No. 1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)



Site: Preliminary Onshore Ground Investigation for NZT

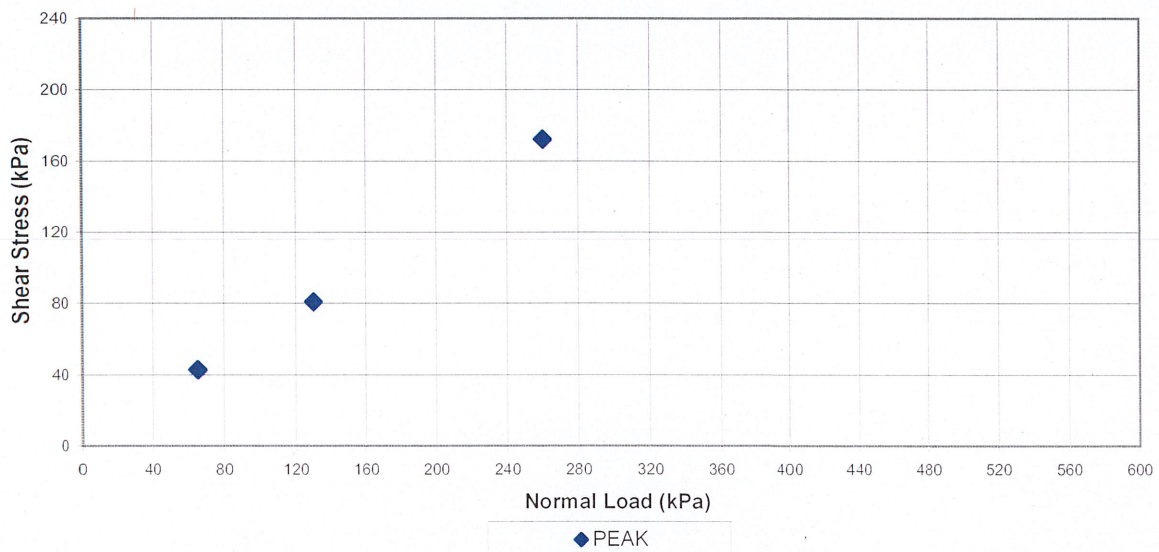
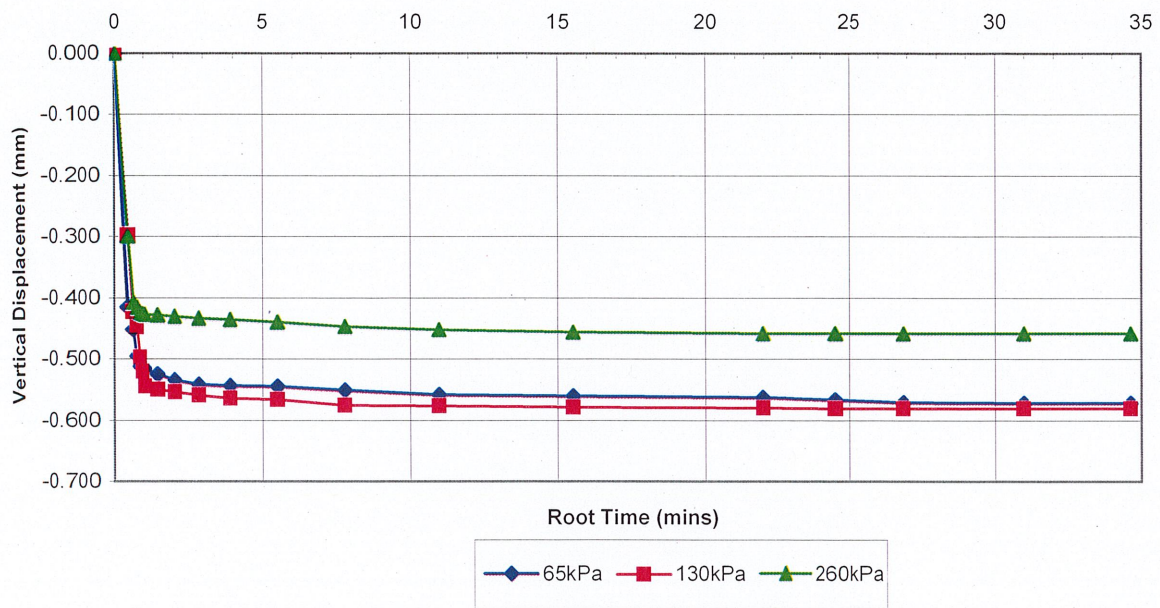
Client: AECOM

Job No: 4339

Borehole: MS\BH14

Sample: B32

Depth: 8.70 m.





ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell
 Chester-le-Street, Co.Durham. DH2 2RG
 a UKAS LABORATORY Testing No. 1367



1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No.: 4339

Borehole: MS\BH14

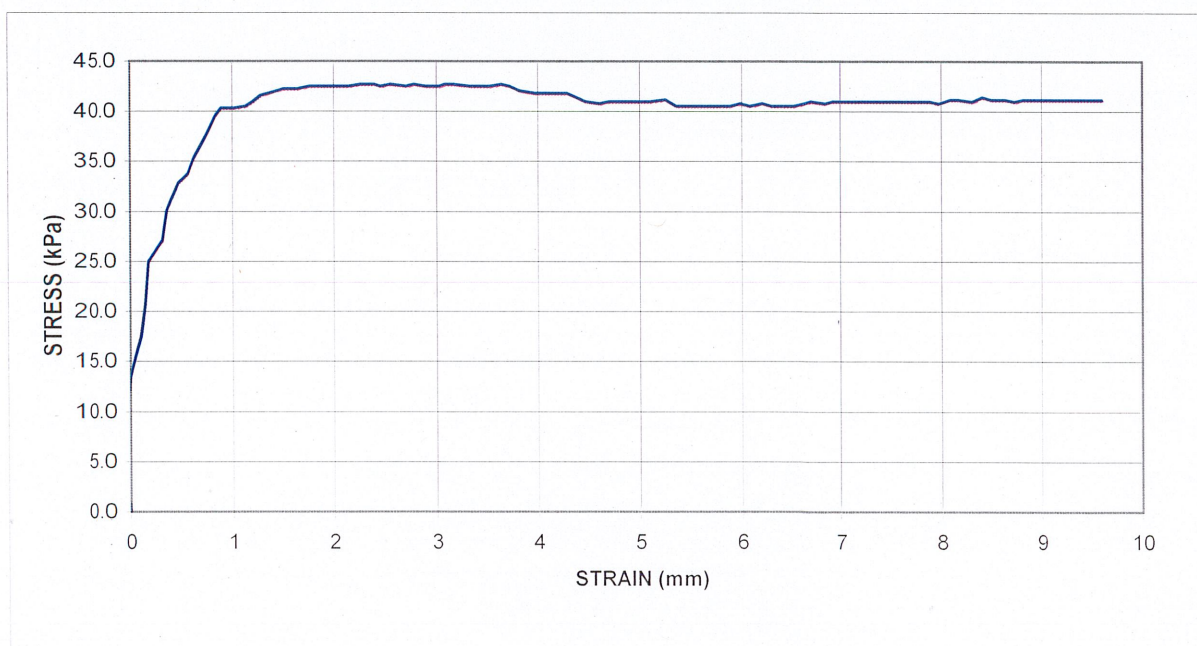
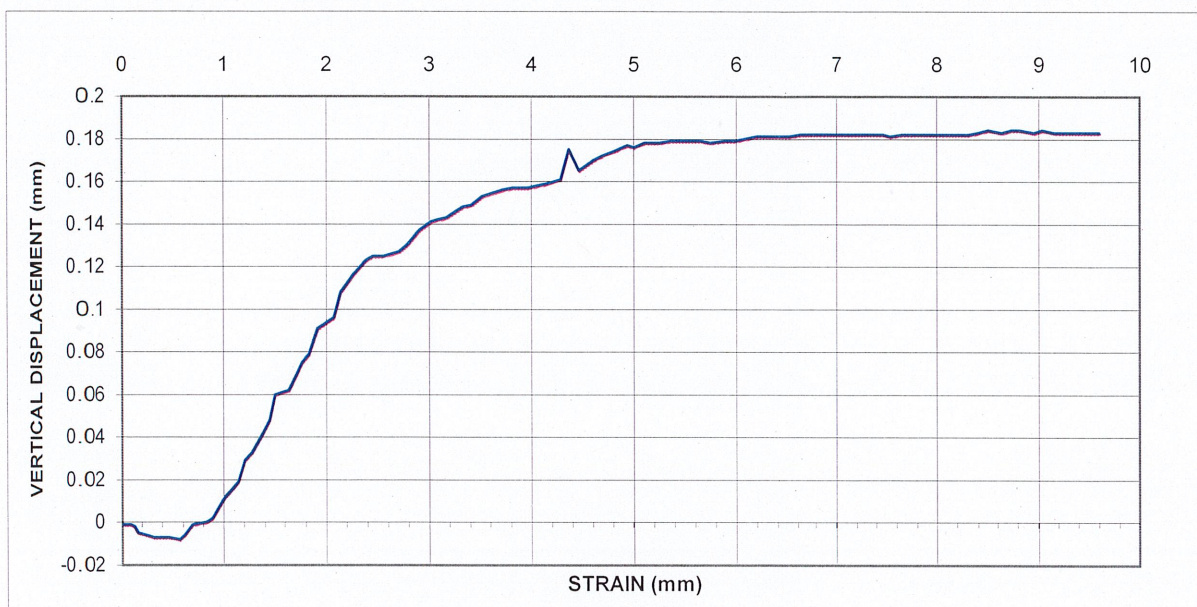
Sample: B32

Depth: 8.70 m.

Stage Number 1

Pressure 65 kPa

65 kPa





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BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No.: 4339

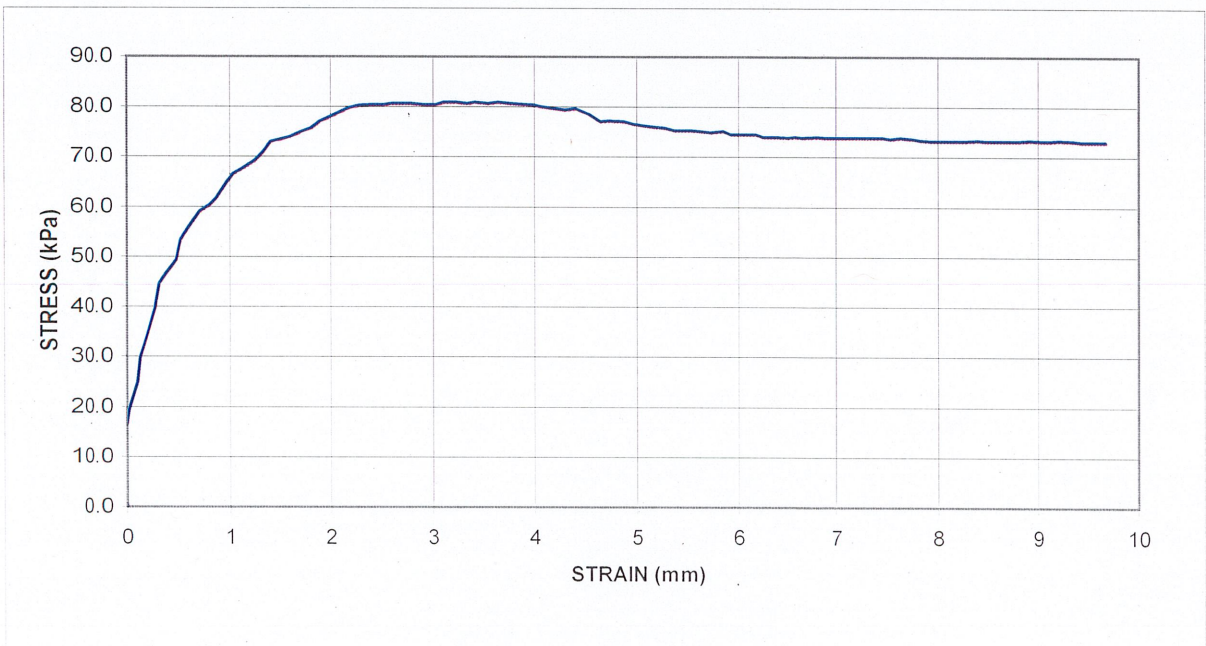
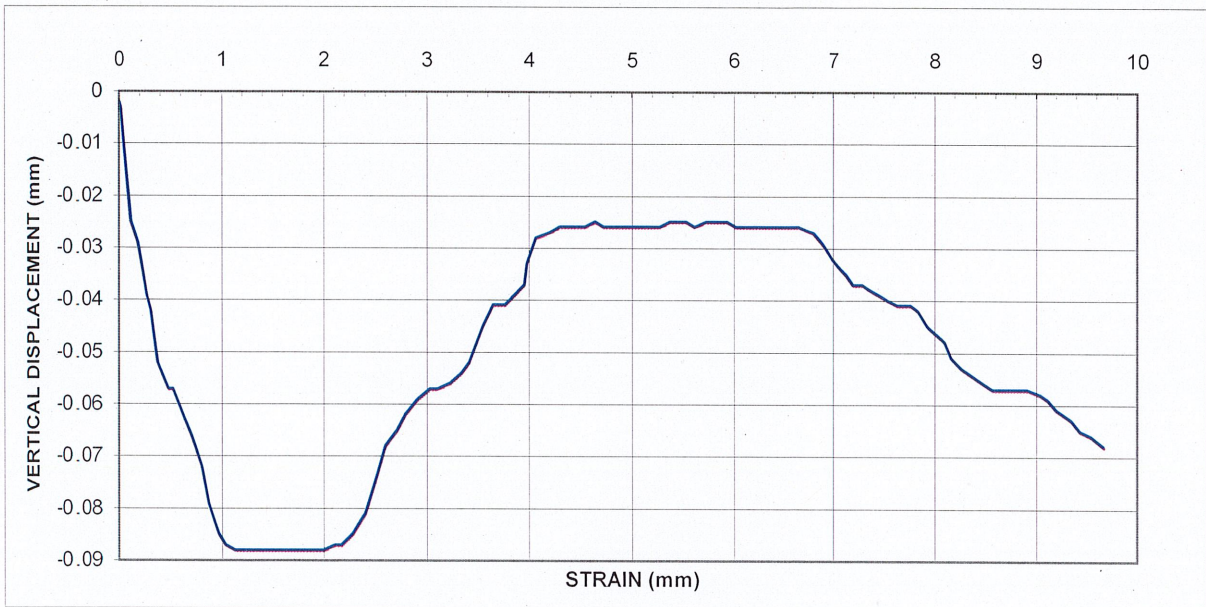
Borehole: MSIBH14

Sample: B32

Depth: 8.70 m.

Stage Number 2

Pressure 130 kPa





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Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No.: 4339

Borehole: MS\BH14

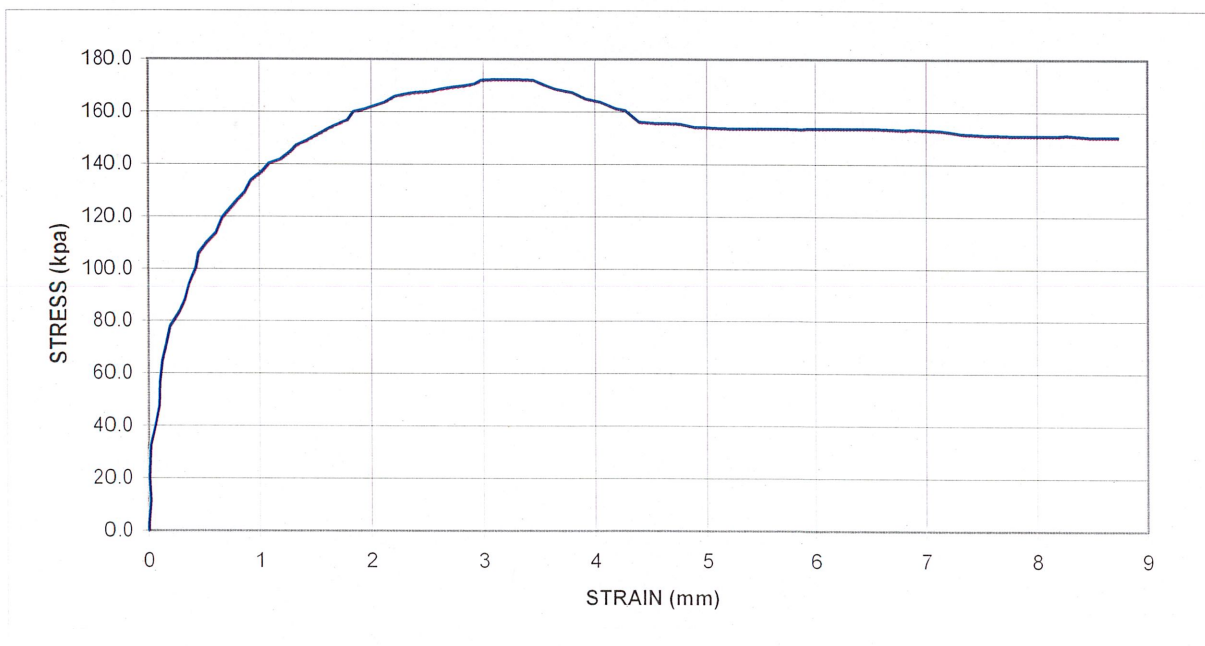
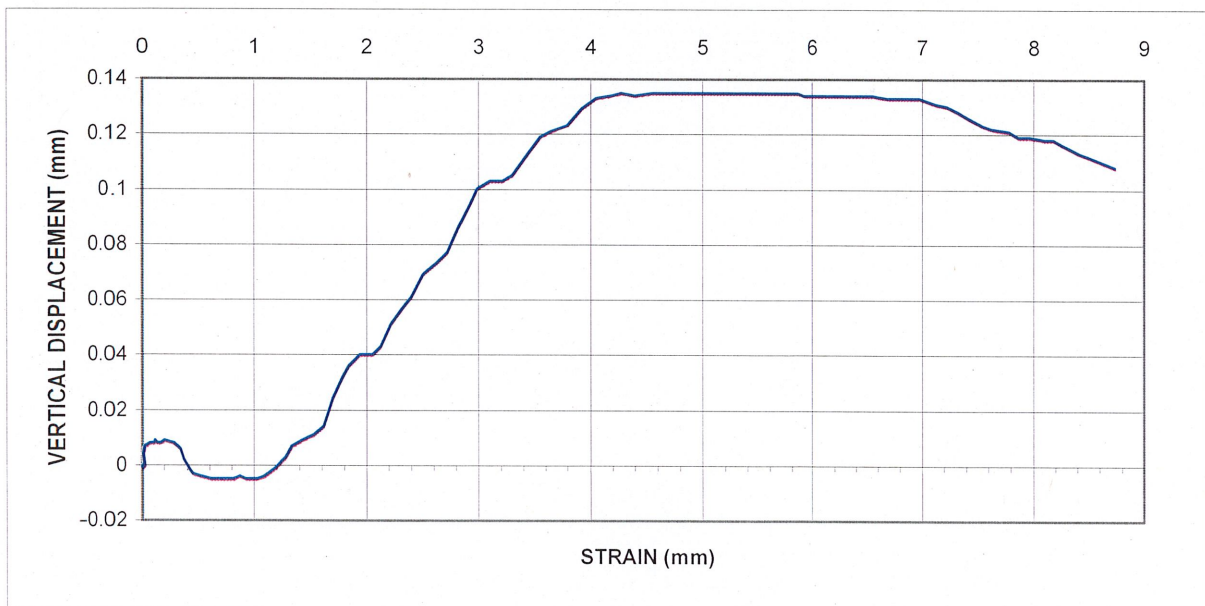
Sample: B32

Depth: 8.70 m.

Stage Number 3

Pressure 260 kPa

260 kPa





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1367

Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

Site: Preliminary Onshore Ground Investigation for NZT

Client: AECOM

Job No. 4339

Borehole: MS BH15

Sample: B30

Depth: 7.95 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	25.7	25.0	24.9
Initial Moisture Content	%	22.5	22.5	22.5
Initial Wet density	mg/m ³	1.79	1.79	1.79
Initial Dry density	mg/m ³	1.46	1.46	1.79
Particle Density (Assumed)	mg/m ³	2.65	2.65	2.65

CONSOLIDATION

Normal Stress	kPa	65	130	260
Height at end of Stage	mm	25.3	24.1	23.1
Duration	Day(s)	0.5	0.5	0.5

SHEARING

Rate of Strain	mm/min	0.135	0.135	0.143
Peak Shear Stress	kPa	23.5	55.8	145.9
Displacement at Peak Stress	mm	2.30	2.31	7.32
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	22.6	22.7	22.3
Final Wet Density	mg/m ³	1.82	1.86	1.93
Final Dry Density	mg/m ³	1.48	1.52	1.57

PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	0
Angle of Shearing Resistance phi 'r	Deg	28°

RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

REMARKS:

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 DATE OF ISSUE 29/09/2021

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Michelle Selkirk