

Job Name: 41 HIGHGATE Sample No: U1
BH Number: 1 Depth (m): 3.00

SPECIMEN DETAILS (TEST #1)

description: Firm grey clay with abundant
(visual) pockets of orange brown sand
preparation: Undisturbed
orientation within original sample: Vertical
test started: 11/03/2009

INITIAL STAGE

type of side drains: Vertical
membrane thickness (mm): 0.3
particle density (Mg/m³): assumed 2.69
voids ratio: 0.58
degree of saturation (%): 96.0

SATURATION STAGE

method: increments of cell and back pressure
final pore water pressure (kPa): 396
final degree of saturation (%): 100.0

CONSOLIDATION STAGE

effective stress (kPa): 30
initial pore water pressure (kPa): 320
final pore water pressure (kPa): 300
pore pressure dissipation (%): 100.0

SHEAR STAGE

failure criterion: maximum deviator stress (kPa)
cell pressure (kPa): 330
initial pore water pressure (kPa): 300
rate of strain (mm/min): 0.012
strain at failure (%): 9.22
volumetric strain (%): 0.12
eff. major principal stress (kPa): 121
eff. minor principal stress (kPa): 30
time to peak dev. stress (min): 583

CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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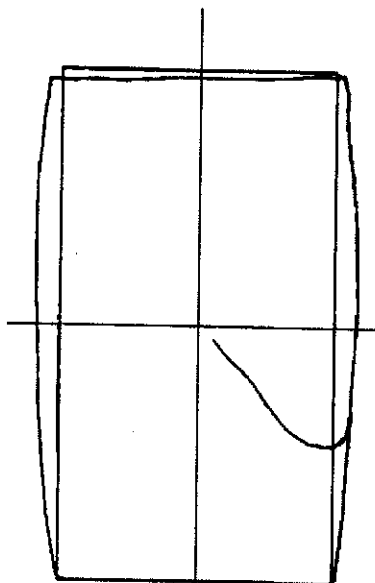
Job name: 41 HIGHGATE Sample No.: U1
BH Number: 1 Depth : 3.00 (m)

SPECIMEN DETAILS

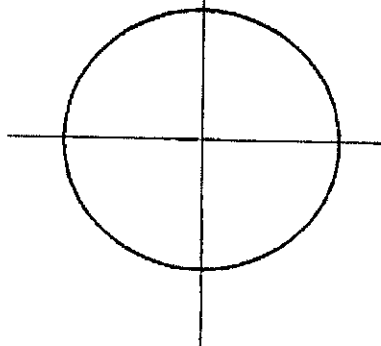
Description : Firm grey clay with abundant
(visual) pockets of orange brown sand
Specimen size: 76 mm high
38 mm diameter

Test No:

Elevation



Plan



FAILURE SKETCH

**CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT**

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Survey Geotechnical Consultants Limited

Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U1
Depth (m): 3.00

SPECIMEN DETAILS (TEST #1)

description: Firm grey clay with abundant
(visual) pockets of orange brown sand

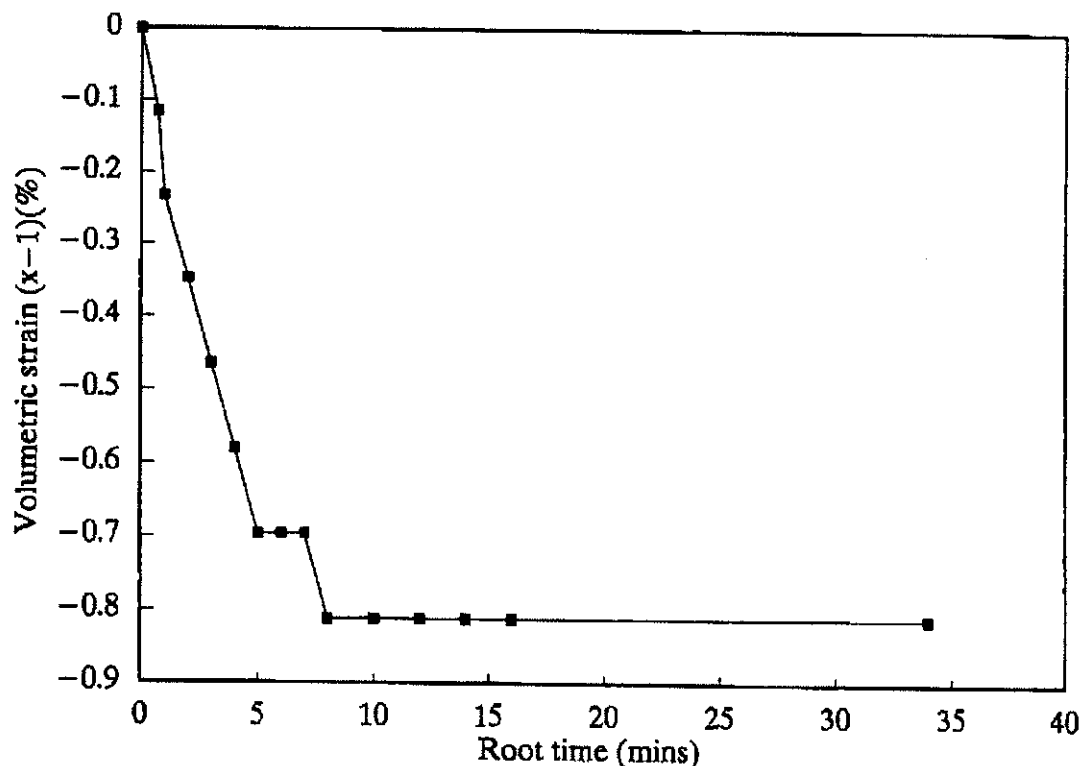
initial and final m/c (%) :	21	21
initial bulk density (Mg/cu.m) :	2.05	
initial dry density (Mg/cu.m) :	1.70	
height and diameter (mm) :	76	38

SATURATION STAGE

cell and back pressure (kPa) :	310	300
B value:	1.00	

CONSOLIDATION STAGE

cell and back pressure (kPa) :	330	300
effective consolidation pressure (kPa) :		30
base, side, top drainage	y y y	



CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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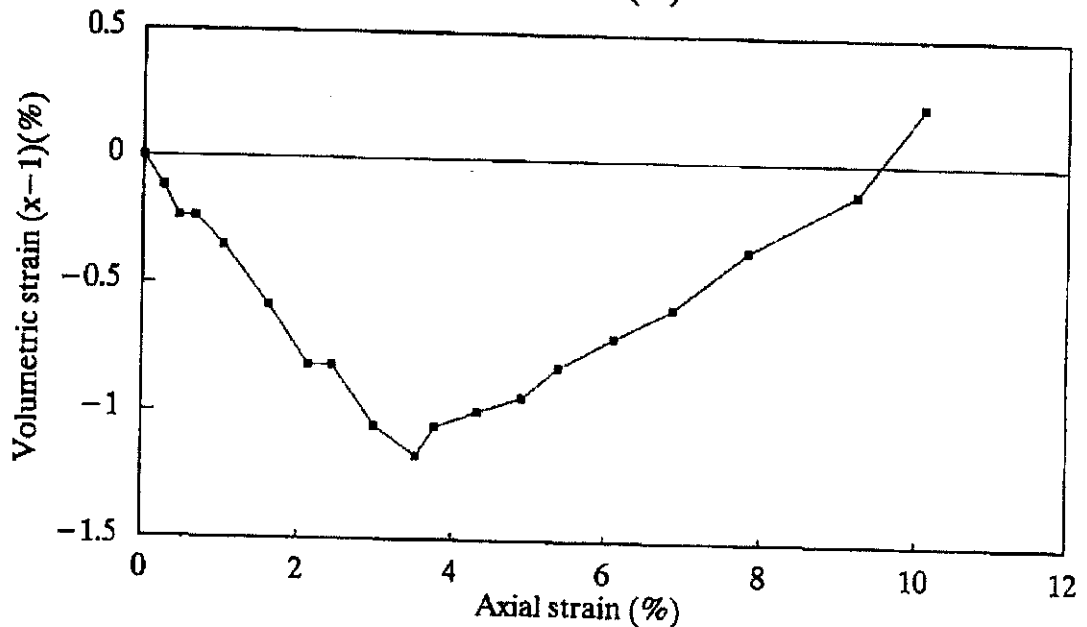
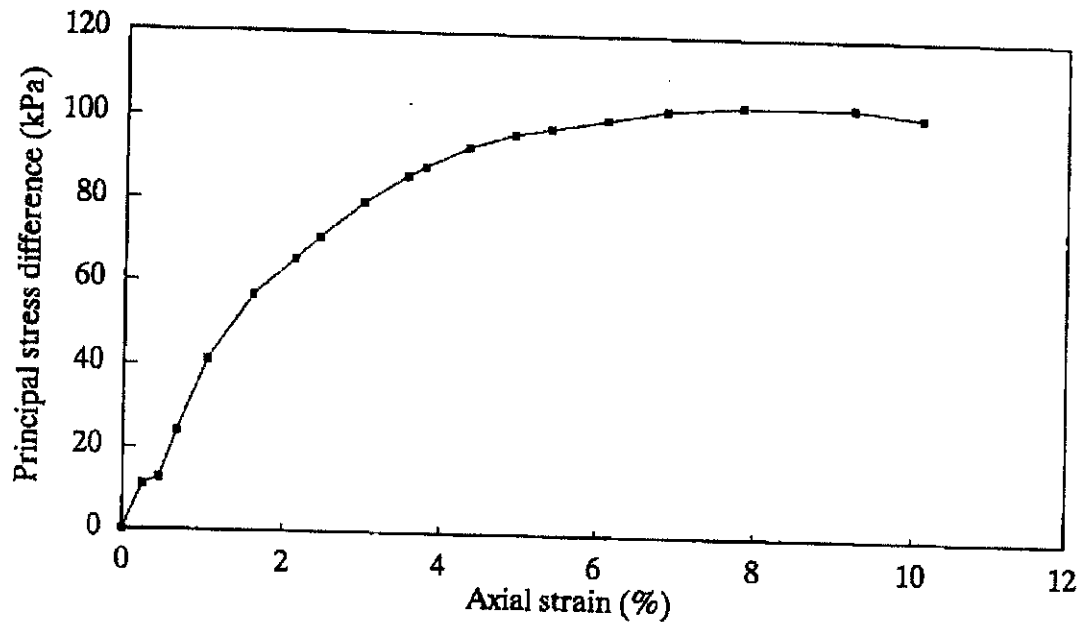
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Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U1
Depth (m): 3.00

SHEAR STAGE (TEST #1)

machine rate of strain (%/hr):	0.95
cell pressure (kPa):	330
measured max. deviator stress (kPa):	104
membrane + filter drain correction (kPa):	12.2
corrected max. deviator stress (kPa):	91
pore pressure at failure (kPa):	300



CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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Job name: 41 HIGHGATE
BH Number: 1

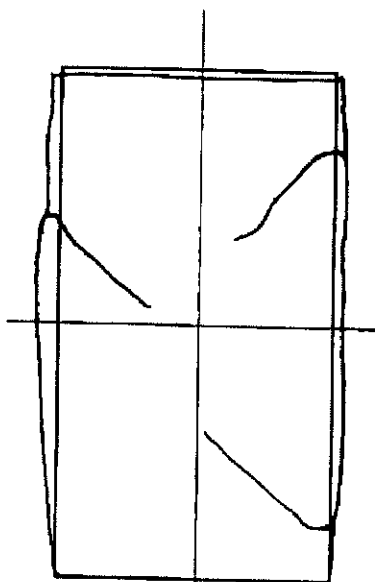
Sample No.: U1
Depth : 3.00 (m)

SPECIMEN DETAILS

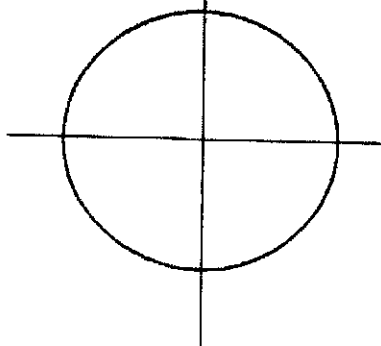
Description : Firm grey clay with abundant
(visual) pockets of orange brown sand
Specimen size: 76 mm high
38 mm diameter

Test No:

Elevation



Plan



FAILURE SKETCH

CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U1
Depth (m): 3.00

SPECIMEN DETAILS (TEST #2)

description: Firm grey clay with abundant
(visual) pockets of orange brown sand

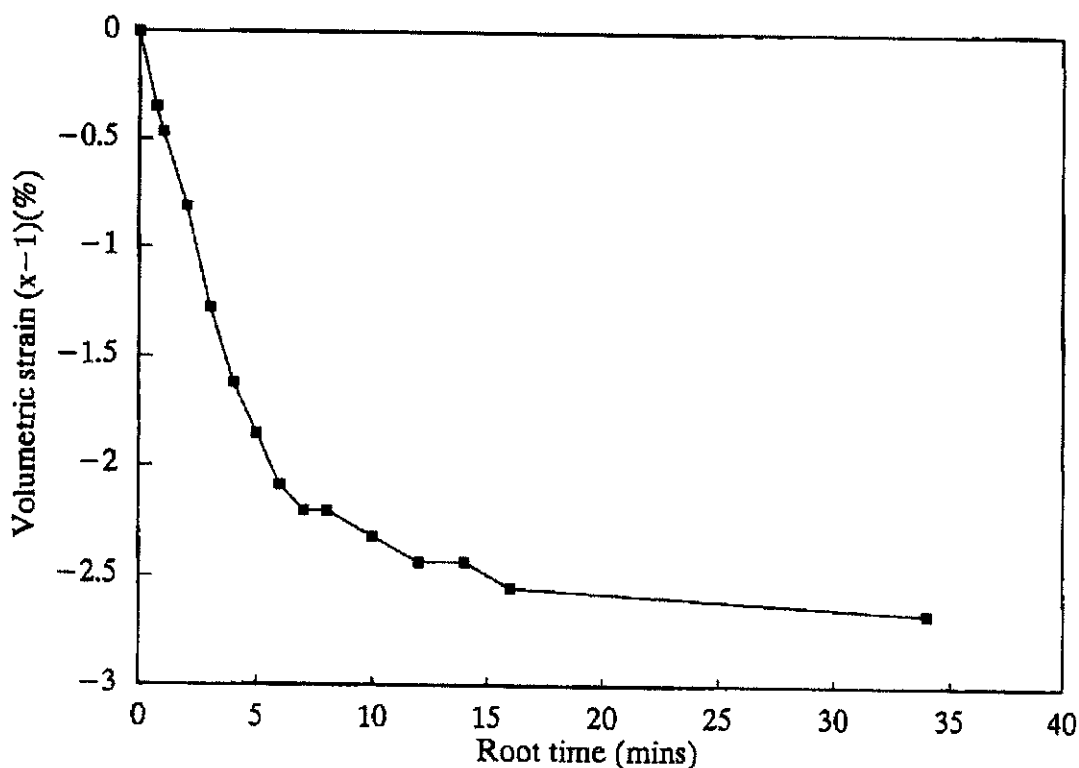
initial and final m/c (%):	22	21
initial bulk density (Mg/cu.m):	2.03	
initial dry density (Mg/cu.m):	1.66	
height and diameter (mm):	76	38

SATURATION STAGE

cell and back pressure (kPa):	310	300
B value:	1	

CONSOLIDATION STAGE

cell and back pressure (kPa):	360	300
effective consolidation pressure (kPa):		60
base, side, top drainage	y y y	



CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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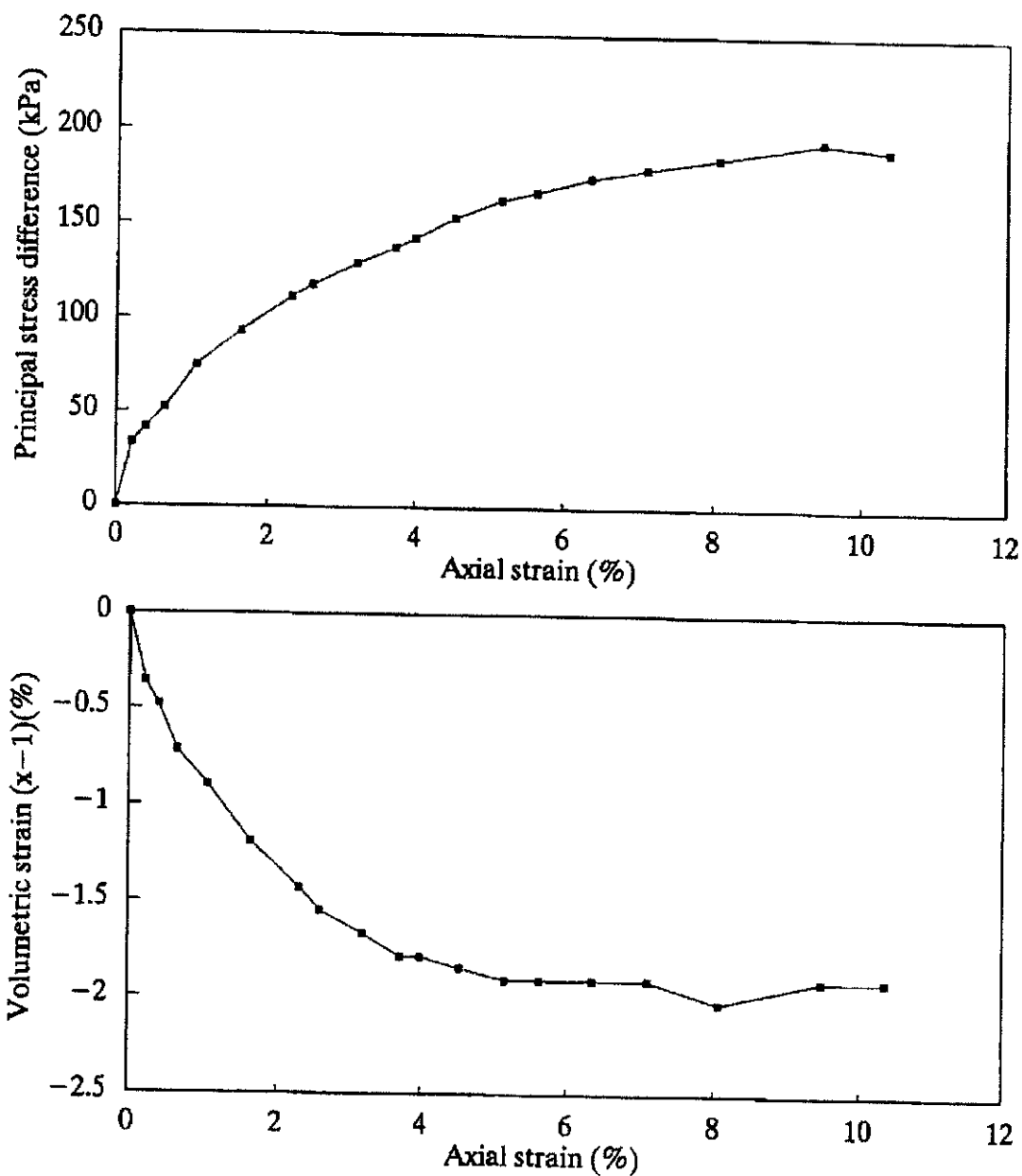
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Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U1
Depth (m): 3.00

SHEAR STAGE (TEST #2)

machine rate of strain (%/hr):	0.95
cell pressure (kPa):	360
measured max. deviator stress (kPa):	194
membrane + filter drain correction (kPa)	11.8
corrected max. deviator stress (kPa):	183
pore pressure at failure (kPa):	300



CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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Job Name: 41 HIGHGATE Sample No:U1
BH Number: 1 Depth (m):3.00

SPECIMEN DETAILS (TEST #3)

description: Firm grey clay with abundant
(visual) pockets of orange brown sand
preparation: Undisturbed
orientation within original sample: Vertical
test started: 11/03/2009

TEST 3

INITIAL STAGE

type of side drains: Vertical
membrane thickness (mm): 0.3
particle density (Mg/m^3): assumed 2.69
voids ratio: 0.63
degree of saturation (%): 96.7

SATURATION STAGE

method: increments of cell and back pressure
final pore water pressure (kPa): 397
final degree of saturation (%): 99.0

CONSOLIDATION STAGE

effective stress (kPa): 120
initial pore water pressure (kPa): 407
final pore water pressure (kPa): 300
pore pressure dissipation (%): 100.0

SHEAR STAGE

failure criterion: maximum deviator stress (kPa)
cell pressure (kPa): 420
initial pore water pressure (kPa): 300
rate of strain (mm/min): 0.012
strain at failure (%): 9.35
volumetric strain at failure (%): 2.05
eff. major principal stress (kPa): 365
eff. minor principal stress (kPa): 121
time to peak dev. stress (min): 585

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WITH VOLUME CHANGE MEASUREMENT

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Job name: 41 HIGHGATE
BH Number: 1

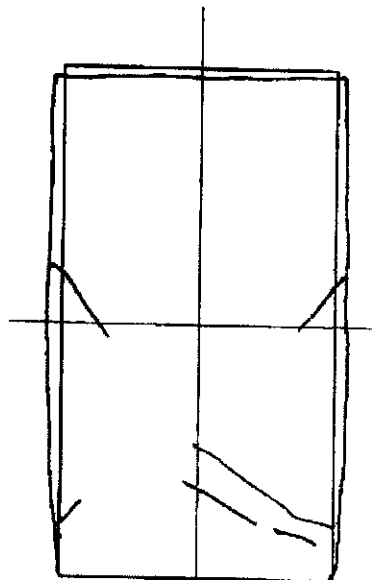
Sample No.: U1
Depth : 3.00 (m)

SPECIMEN DETAILS

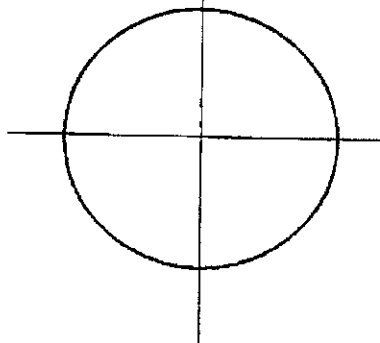
Description : Firm grey clay with abundant
(visual) pockets of orange brown sand
Specimen size: 76 mm high
38 mm diameter

Test No:

Elevation



Plan



FAILURE SKETCH

CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U1
Depth (m): 3.00

SPECIMEN DETAILS (TEST #3)

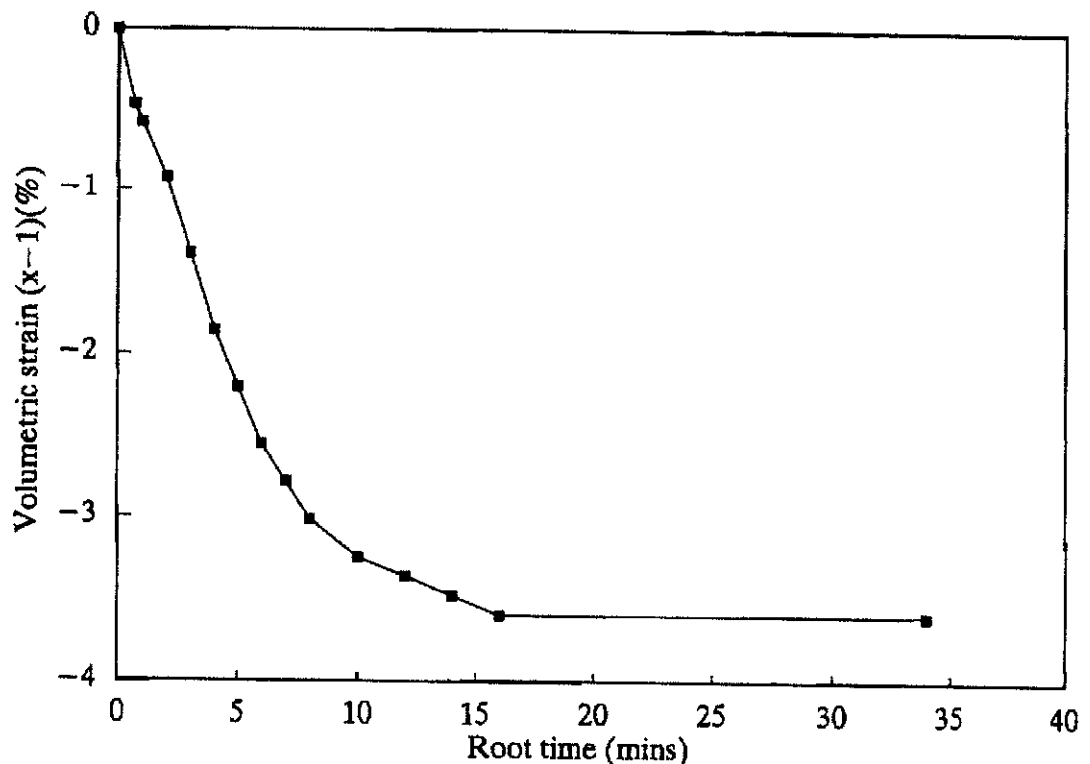
description: Firm grey clay with abundant
(visual) pockets of orange brown sand
initial and final m/c (%): 23 21
initial bulk density (Mg/cu.m): 2.02
initial dry density (Mg/cu.m): 1.65
height and diameter (mm): 76 38

SATURATION STAGE

cell and back pressure (kPa): 310 300
B value: 0.99

CONSOLIDATION STAGE

cell and back pressure (kPa): 420 300
effective consolidation pressure (kPa): 120
base, side, top drainage y y y



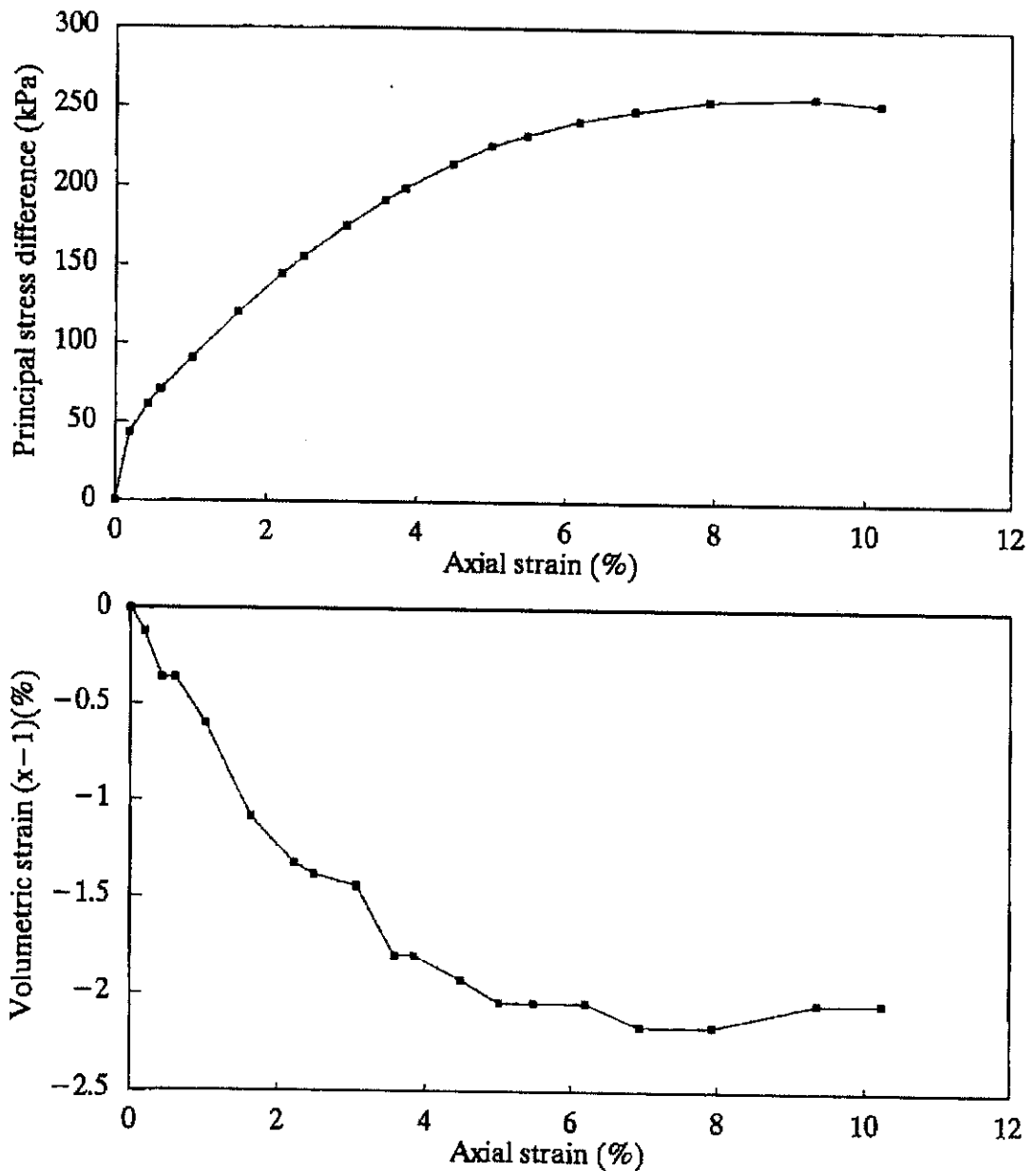
CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U1
Depth (m): 3.00

SHEAR STAGE (TEST #3)

machine rate of strain (%/hr):	0.95
cell pressure (kPa):	420
measured max. deviator stress (kPa):	257
membrane + filter drain correction (kPa)	12.2
corrected max. deviator stress (kPa):	244
pore pressure at failure (kPa):	299



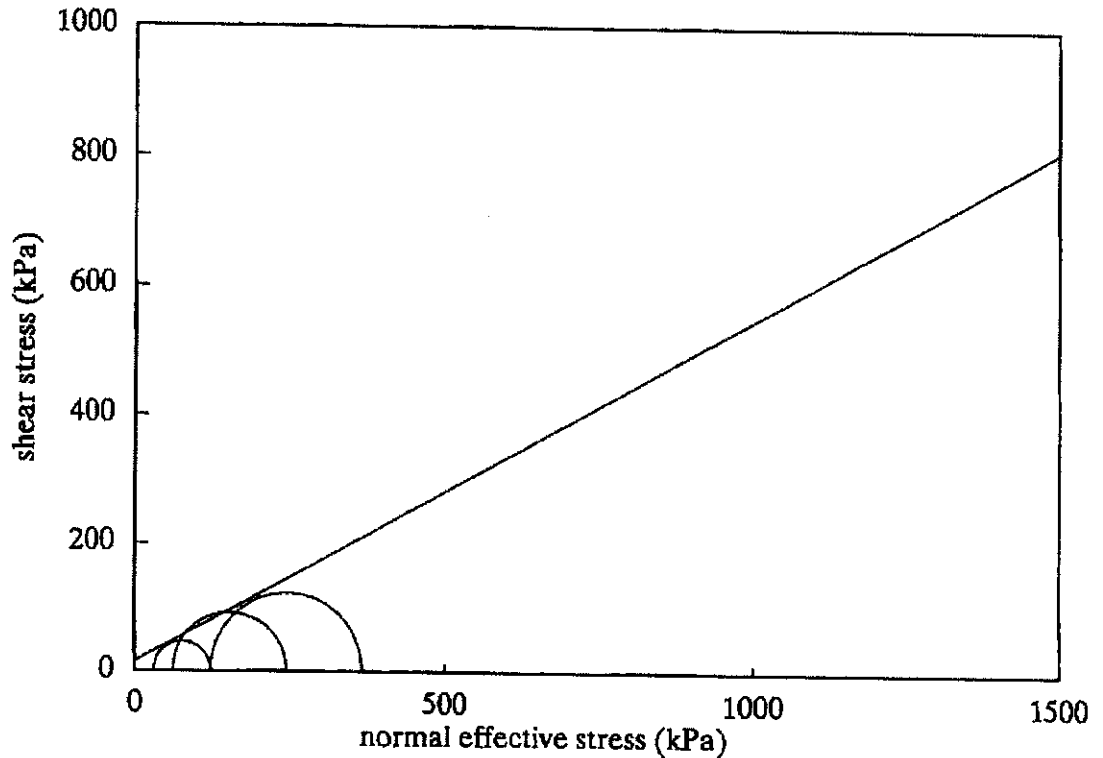
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WITH VOLUME CHANGE MEASUREMENT

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Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U1
Depth (m): 3.00



SUMMARY

At maximum principal stress difference:

	#1	#2	#3
cell pressure (kPa)	330	360	420
deviator stress (kPa)	91	183	244
pore pressure (kPa)	300	300	299

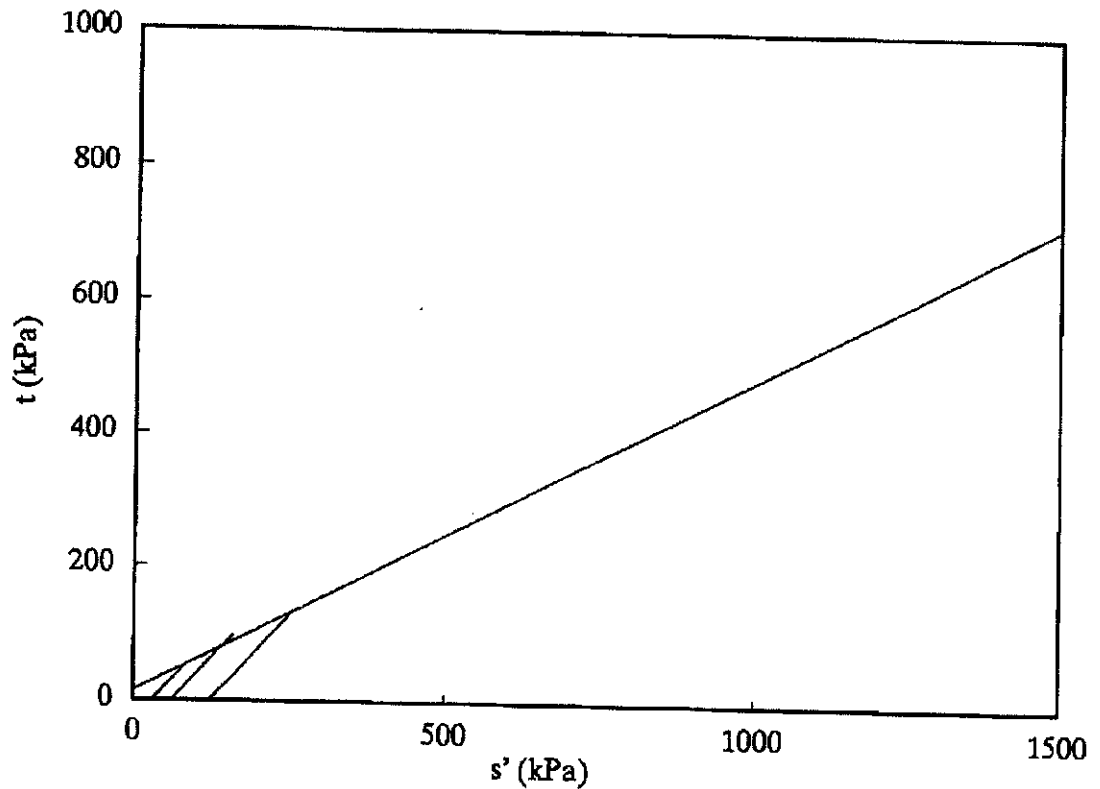
Effective strength parameters:

effective cohesion intercept (kPa)	15.0
effective angle of friction (degrees)	28.0

CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U1
Depth (m): 3.00



NOTES ON STRESS PATH PLOTS

1. No membrane or filter drain corrections made to stress path plots
2. Effective stress paths assume full pore water pressure equalization at all times after the start of shear. This assumption is incorrect. The rate of shearing has been estimated to give 95% equalization only at failure.

CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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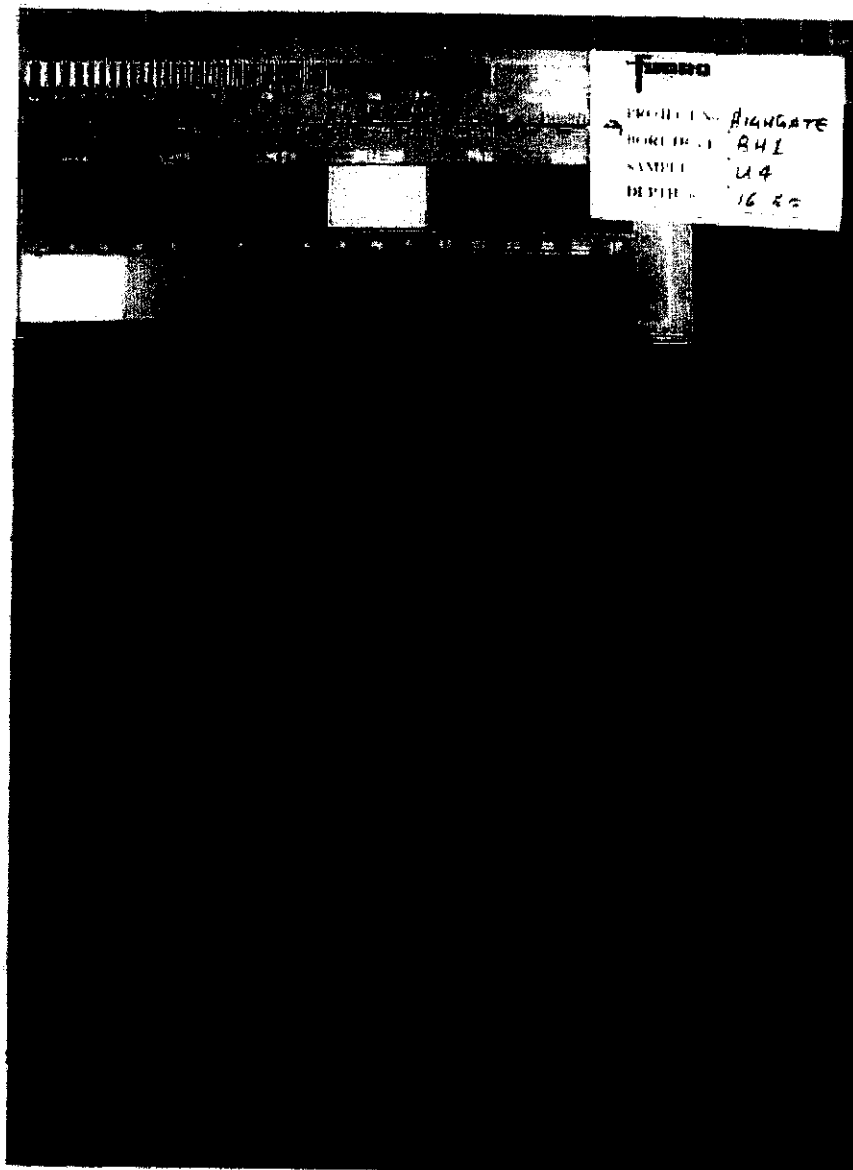
Soil & Geotechnical Consultants Limited

**GROUND ENGINEERING
HIGHGATE**

VISUAL DESCRIPTION

Firm grey CLAY with thinly interlaminated orange brown fine SAND and few pockets of silt

SPECIMEN PHOTOGRAPHS



Borehole
Sample
Depth (m)

BH1
U4
16.60

Job Name: 41 HIGHGATE Sample No: U4
BH Number: 1 Depth (m): 16.60

SPECIMEN DETAILS (TEST #1)

description: Firm orange brown & grey
(visual) fine SAND with silt & pockets of clay
preparation: Undisturbed
orientation within original sample: Vertical
test started: 04/03/2009

TEST 1

INITIAL STAGE

type of side drains: Vertical
membrane thickness (mm): 0.3
particle density (Mg/m^3): assumed 2.67
voids ratio: 0.69
degree of saturation (%): 100.6

SATURATION STAGE

method: increments of cell pressure only
final pore water pressure (kPa): 384
final degree of saturation (%): 99.0

CONSOLIDATION STAGE

effective stress (kPa): 135
initial pore water pressure (kPa): 423
final pore water pressure (kPa): 300
pore pressure dissipation (%): 100.0

SHEAR STAGE

failure criterion: maximum deviator stress (kPa)
cell pressure (kPa): 435
initial pore water pressure (kPa): 300
rate of strain (mm/min): 0.012
strain at failure (%): 8.37
volumetric strain (%): 1.31
eff. major principal stress (kPa): 510
eff. minor principal stress (kPa): 135
time to peak dev. stress (min): 526

CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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Job name: 41 HIGHGATE
BH Number: 1

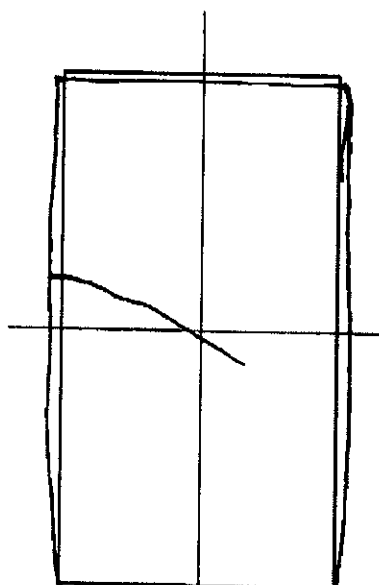
Sample No.: U4
Depth : 16.60 (m)

SPECIMEN DETAILS

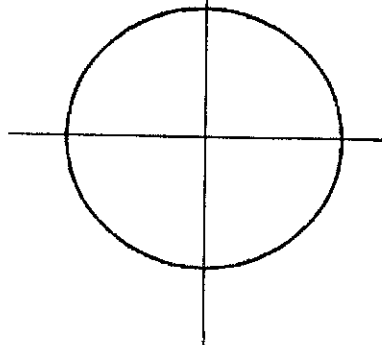
Description : Firm orange brown & grey
(visual) fine SAND with silt & pockets of clay
Specimen size: 76 mm high
38 mm diameter

Test No:

Elevation



Plan



FAILURE SKETCH

CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U4
Depth (m): 16.60

SPECIMEN DETAILS (TEST #1)

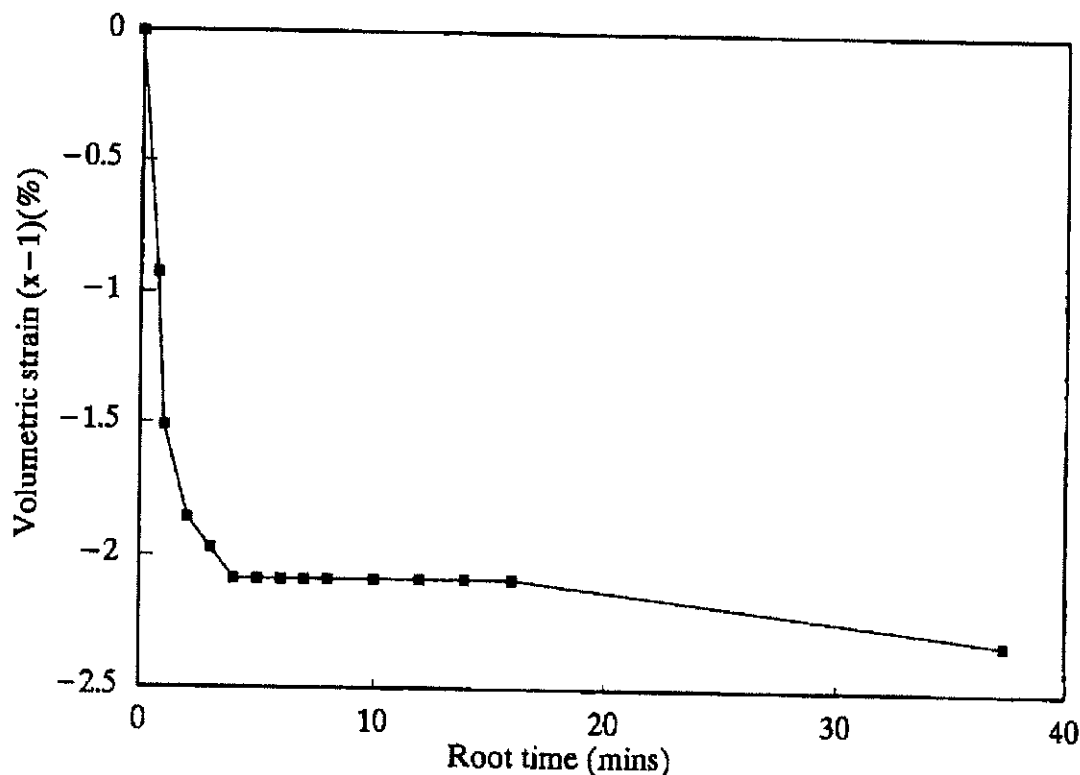
description: Firm orange brown & grey
(visual) fine SAND with silt & pockets of clay
initial and final m/c (%): 26 25
initial bulk density (Mg/cu.m): 1.99
initial dry density (Mg/cu.m): 1.58
height and diameter (mm): 76 38

SATURATION STAGE

cell and back pressure (kPa):
B value: 0.99

CONSOLIDATION STAGE

cell and back pressure (kPa): 435 300
effective consolidation pressure (kPa): 135
base, side, top drainage Y Y Y



CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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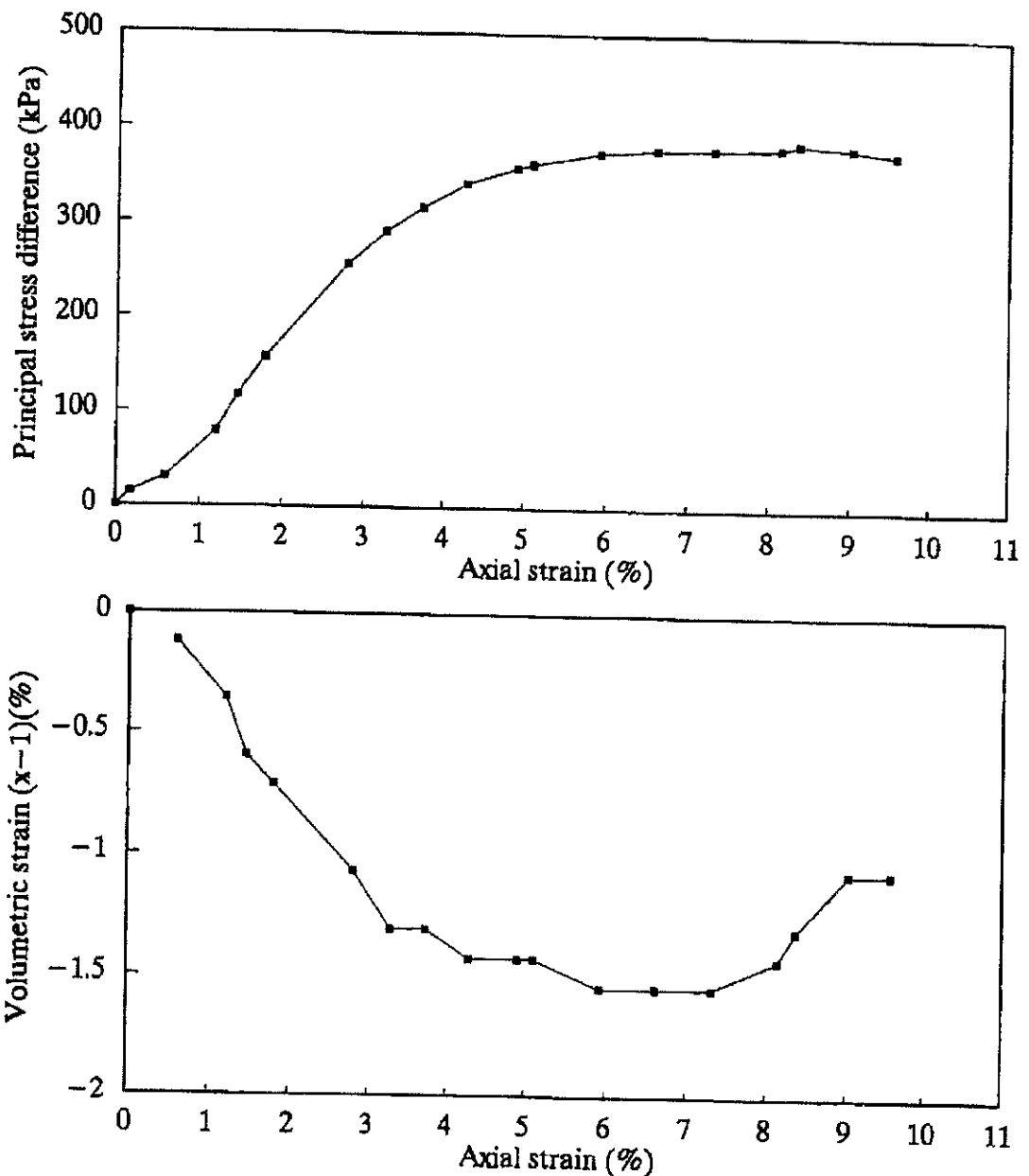
Soil Testing and Geotechnical Engineering Limited

Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U4
Depth (m): 16.60

SHEAR STAGE (TEST #1)

machine rate of strain (%/hr):	0.95
cell pressure (kPa):	435
measured max. deviator stress (kPa):	387
membrane + filter drain correction (kPa):	11.8
corrected max. deviator stress (kPa):	375
pore pressure at failure (kPa):	300



CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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Job Name: 41 HIGHGATE Sample No:U4
BH Number: 1 Depth (m):16.60

SPECIMEN DETAILS (TEST #2)

description: Firm orange brown & grey
(visual) fine SAND with silt & pockets of clay
preparation: Undisturbed
orientation within original sample: Vertical
test started: 04/03/2009

TEST 2

INITIAL STAGE
type of side drains: Vertical
membrane thickness (mm): 0.3
particle density (Mg/m³): assumed 2.67
voids ratio: 0.73
degree of saturation (%): 93.1

SATURATION STAGE

method: increments of cell pressure only
final pore water pressure (kPa): 397
final degree of saturation (%): 100.0

CONSOLIDATION STAGE

effective stress (kPa): 235
initial pore water pressure (kPa): 537
final pore water pressure (kPa): 300
pore pressure dissipation (%): 100.0

SHEAR STAGE

failure criterion: maximum deviator stress (kPa)
cell pressure (kPa): 535
initial pore water pressure (kPa): 300
rate of strain (mm/min): 0.012
strain at failure (%): 7.78
volumetric strain at failure (%): 3.66
eff. major principal stress (kPa): 891
eff. minor principal stress (kPa): 235
time to peak dev. stress (min): 474

CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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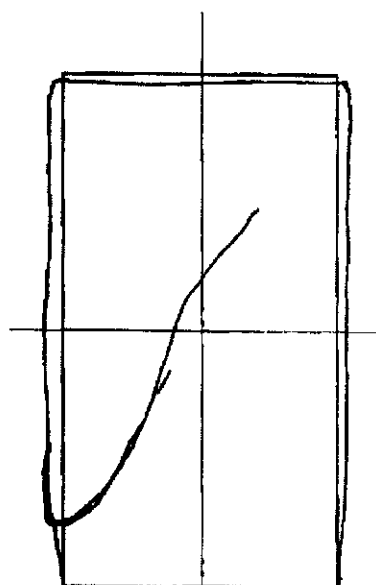
Job name: 41 HIGHGATE Sample No.: U4
BH Number: 1 Depth : 16.60 (m)

SPECIMEN DETAILS

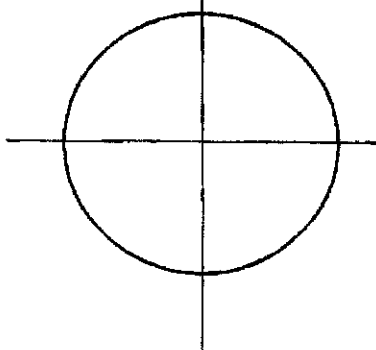
Description : Firm orange brown & grey
(visual) fine SAND with silt & pockets of clay
Specimen size: 76 mm high
38 mm diameter

Test No:

Elevation



Plan



FAILURE SKETCH

CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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Job Name: 41 HIGHGATE
BH Number: 1

Sample No.: U4
Depth (m): 16.60

SPECIMEN DETAILS (TEST #2)

description: Firm orange brown & grey
(visual) fine SAND with silt & pockets of clay
initial and final m/c (%): 26 24
initial bulk density (Mg/cu.m): 1.94
initial dry density (Mg/cu.m): 1.54
height and diameter (mm): 76 38

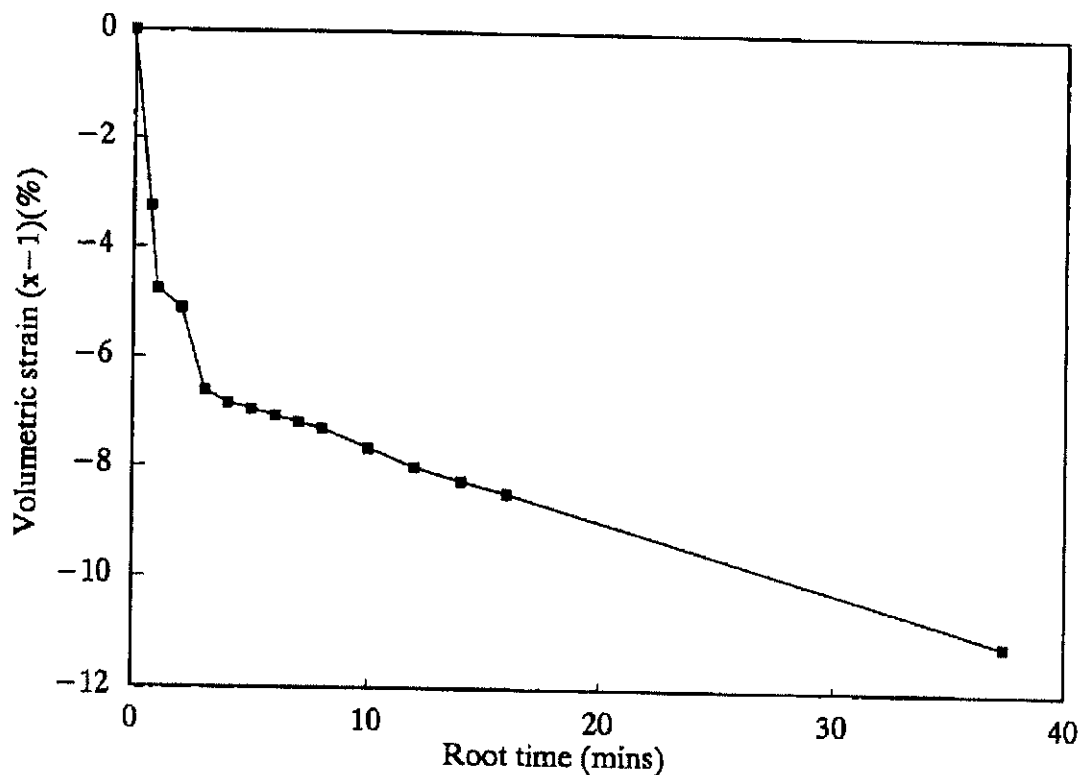
SATURATION STAGE

cell and back pressure (kPa):
B value:

1

CONSOLIDATION STAGE

cell and back pressure (kPa): 535 300
effective consolidation pressure (kPa): 235
base, side, top drainage y y y



CONSOLIDATED DRAINED TRIAXIAL TEST
WITH VOLUME CHANGE MEASUREMENT

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