DIRECT SHEAR TEST DATA
ASTM D 3080

CLIENT Tetra Tech

JOB NO. 2592-04

BORING NO.	Tt-5	SAMPLED	03-28-08 JLR
DEPTH	26.5'	TEST STARTED	04-23-08 CAL
SAMPLE NO.	B	TEST FINISHED	04-23-08 DPM
POINT	A	CELL NUMBER	Geomatic
SOIL DESCR.	#114-181750	SATURATED TEST	Yes
LOCATION	Rocky Flats OLF	TEST TYPE	CD
NORMAL STRESS (psf)	5992		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	97.9	97.9
Wt. Wet Soil & Pan (g)	104.6	104.6
Wt. Dry Soil & Pan (g)	87.0	87.0
Wt. Lost Moisture (g)	17.6	17.6
Wt. of Pan Only (g)	6.7	6.7
Wt. of Dry Soil (g)	80.3	80.3
Moisture Content %	21.9	21.9
Wet Density (pcf)	126.4	132.3
Dry Density (pcf)	103.7	108.5

Init. Diameter (in)	1.938
Init. Area (sq in)	2.950
Init. Height (in)	1.000
Vol. Bef. Consol. (cu ft)	0.00171
Final Height (in)	0.956
Vol. After Consol. (cu ft)	0.00163

Test Set Up: Continuous Increasing Deflection Control
Shear Speed: 0.00690 in/min

Notes & Comments:

Data File Name: TTDST52A.DAT

Normal Stress:	5992 psf	41.61 psi
Peak Stress:	3524 psf	24.47 psi
Ultimate Stress:	3524 psf	24.47 psi

Data entry by: SR Date: 05/02/2008
Data checked by: DPM Date: 5/5/08
FileName: TTDSTT5

ADVANCED TERRA TESTING, Inc. ATT

DIRECT SHEAR TEST DATA
ASTM D 3080

CLIENT Tetra Tech

JOB NO. 2592-04

BORING NO.	Tt-5	SAMPLED	03-28-08 JLR
DEPTH	26.5'	TEST STARTED	04-23-08 CAL
SAMPLE NO.	B	TEST FINISHED	04-23-08 DPM
POINT	B	CELL NUMBER	Geomatic
SOIL DESCR.	#114-181750	SATURATED TEST	Yes
LOCATION	Rocky Flats OLF	TEST TYPE	CD
NORMAL STRESS (psf)	2938		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	98.1	99.7
Wt. Wet Soil & Pan (g)	104.9	106.4
Wt. Dry Soil & Pan (g)	87.7	87.7
Wt. Lost Moisture (g)	17.2	18.8
Wt. of Pan Only (g)	6.8	6.8
Wt. of Dry Soil (g)	80.9	80.9
Moisture Content %	21.2	23.2
Wet Density (pcf)	126.7	137.6
Dry Density (pcf)	104.5	111.7

Init. Diameter (in)	1.938
Init. Area (sq in)	2.950
Init. Height (in)	1.000
Vol. Bef. Consol. (cu ft)	0.00171
Final Height (in)	0.936
Vol. After Consol. (cu ft)	0.00160

Test Set Up: Continuous Increasing Deflection Control
Shear Speed: 0.00690 in/min

Notes & Comments:

Data File Name: TTDST52B.DAT

Normal Stress:	2938 psf	20.40 psi
Peak Stress:	1977 psf	13.73 psi
Ultimate Stress:	1865 psf	12.95 psi

Data entry by: SR Date: 05/02/2008
Data checked by: DPM Date: 5/5/08
FileName: TTDSTT5

ADVANCED TERRA TESTING, Inc. ATT

DIRECT SHEAR TEST DATA
ASTM D 3080

CLIENT Tetra Tech

JOB NO. 2592-04

BORING NO.	Tt-5	SAMPLED	03-28-08 JLR
DEPTH	26.5'	TEST STARTED	04-23-08 CAL
SAMPLE NO.	B	TEST FINISHED	04-23-08 DPM
POINT	C	CELL NUMBER	Geomatic
SOIL DESCR.	#114-181750	SATURATED TEST	Yes
LOCATION	Rocky Flats OLF	TEST TYPE	CD
NORMAL STRESS (psf)	1469		

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	99.0	100.3
Wt. Wet Soil & Pan (g)	105.7	107.0
Wt. Dry Soil & Pan (g)	88.0	88.0
Wt. Lost Moisture (g)	17.8	19.1
Wt. of Pan Only (g)	6.7	6.7
Wt. of Dry Soil (g)	81.2	81.2
Moisture Content %	21.9	23.5
Wet Density (pcf)	127.9	131.5
Dry Density (pcf)	104.9	106.5

Init. Diameter (in)	1.938
Init. Area (sq in)	2.950
Init. Height (in)	1.000
Vol. Bef. Consol. (cu ft)	0.00171
Final Height (in)	0.985
Vol. After Consol. (cu ft)	0.00168

Test Set Up: Continuous Increasing Deflection Control
Shear Speed: 0.00690 in/min

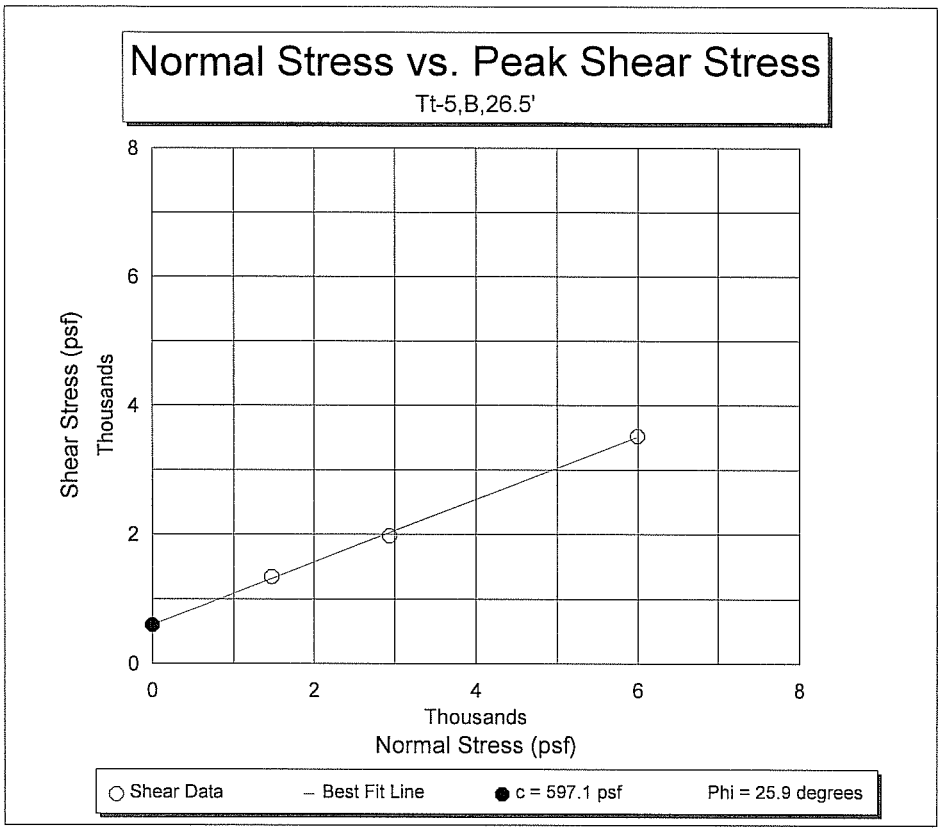
Notes & Comments:

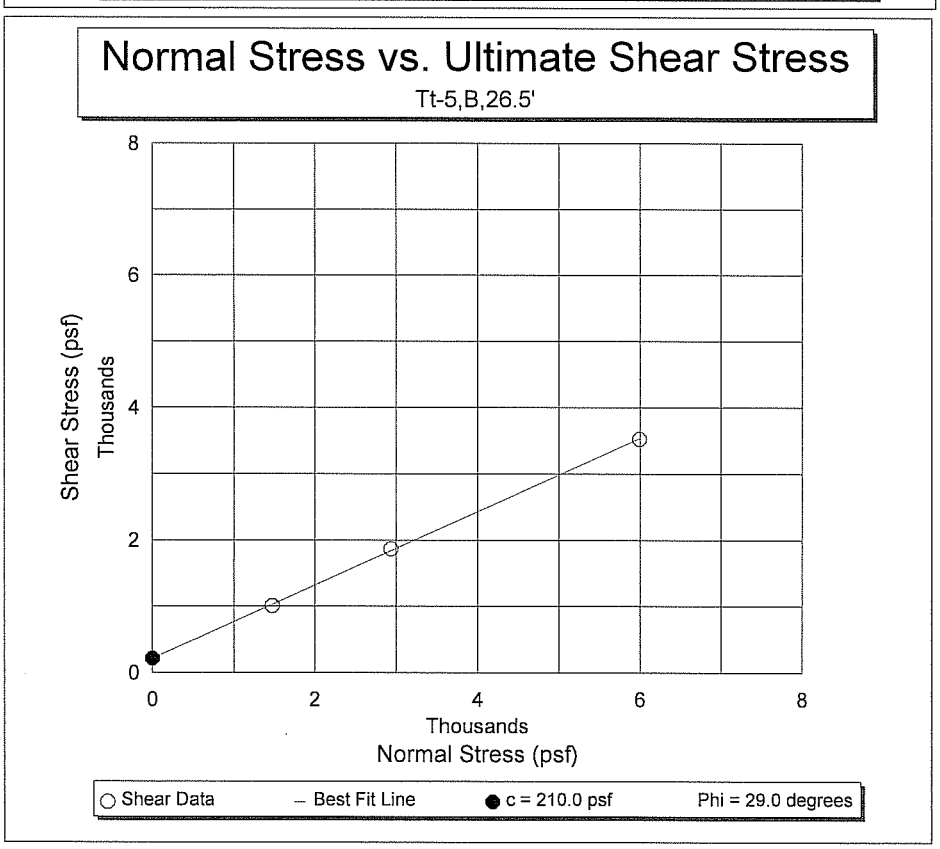
Data File Name: TTDST52C.DAT

Normal Stress:	1469 psf	10.20 psi
Peak Stress:	1343 psf	9.33 psi
Ultimate Stress:	1007 psf	6.99 psi

Data entry by: SR Date: 05/02/2008
Data checked by: DPM Date: 5/5/08
FileName: TTDSTT5

ADVANCED TERRA TESTING, INC. ATT


Normal Stress vs. Peak Shear Stress
Tt-5,B,26.5'
Shear Stress (psf)
Thousands
0
2
4
6
8
Thousands
Normal Stress (psf)
Shear Data
Best Fit Line
c = 597.1 psf
Phi = 25.9 degrees


Normal Stress vs. Ultimate Shear Stress
Tt-5,B,26.5'
Shear Stress (psf)
Thousands
0
2
4
6
8
Thousands
Normal Stress (psf)
Shear Data
Best Fit Line
c = 210.0 psf
Phi = 29.0 degrees

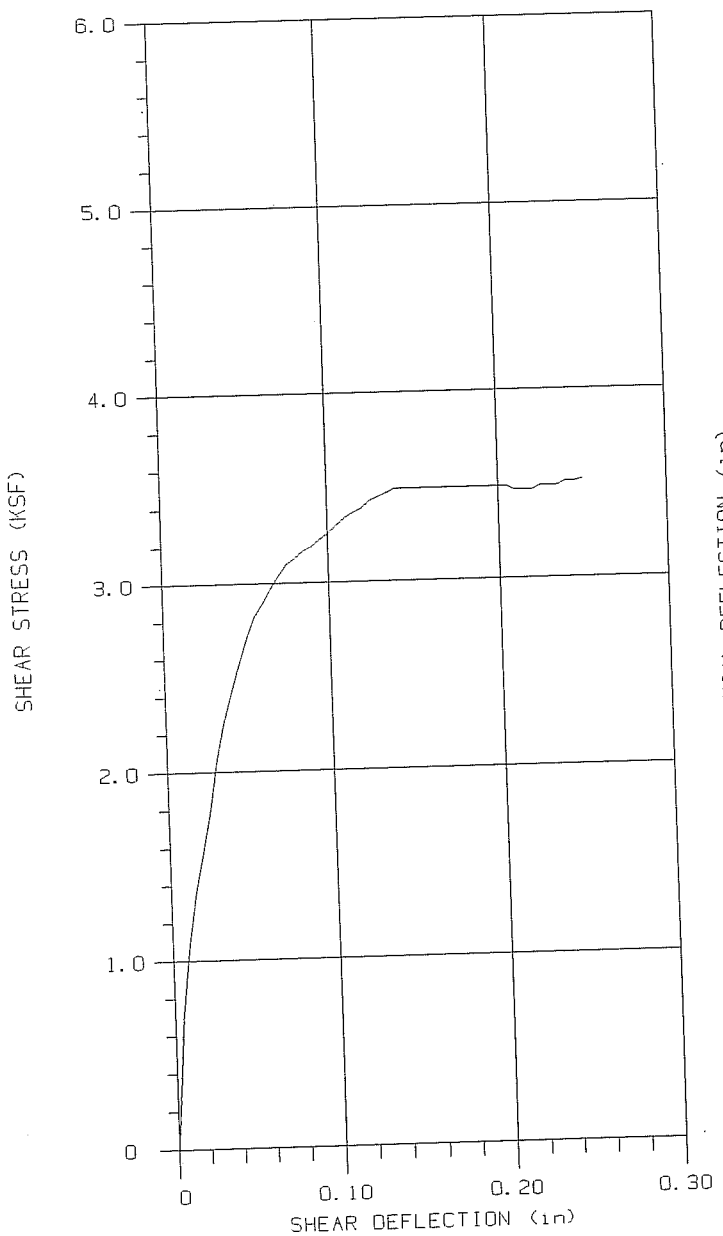
ADVANCED TERRA TESTING

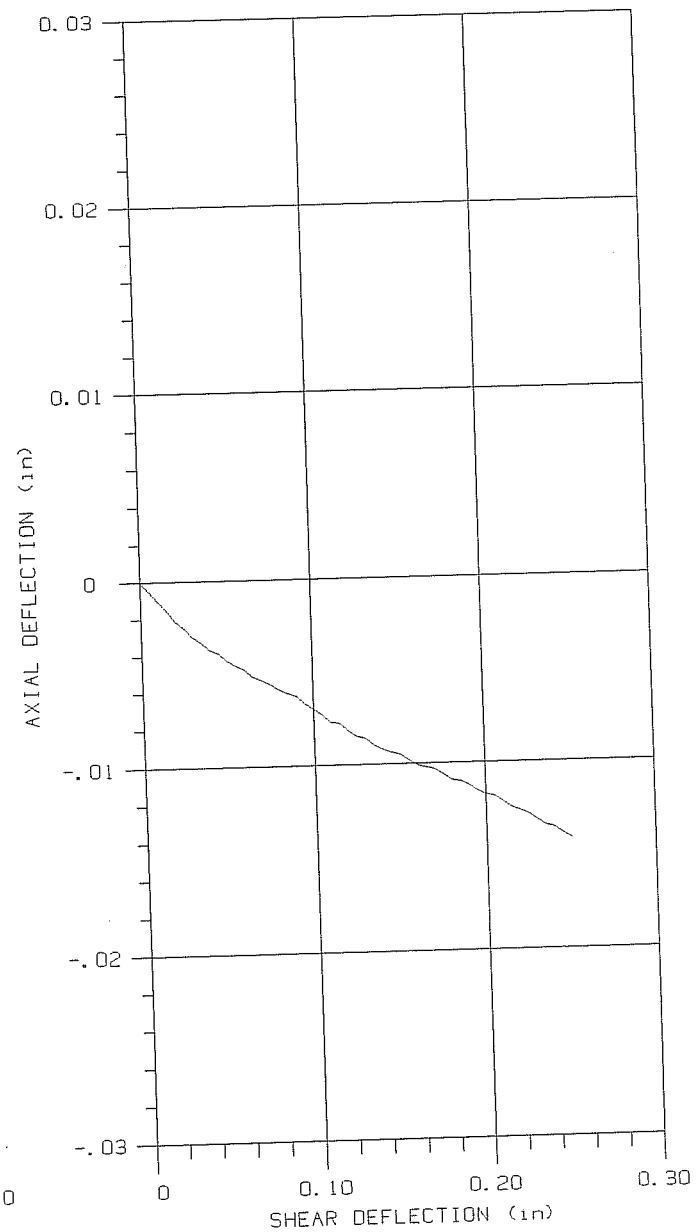
Direct Shear Test

Client..... Tetra Tech
Location..... Rocky Flats OLF

Soil Type..... 114-181750
Depth..... 26.5 (ft)
Confining Pressure.. 5992 (psf)
Shear Rate..... .0068 (in/min)
Date Tested..... 04-23-2008

Job Number..... 2592-04
Sample Number... B Pt. A
Boring..... Tt-5
File Name..... ttdst52a.DAT
Tested By..... DPM





Pass Number and Line Type....	1 ———	2 - - - - - -	3 ——— -	4 ——— - - -
Maximum Shear Stress.....	3524	.0000	.0000	.0000
Shear Deflection @ Max Stress.	.2472	.0000	.0000	.0000

GEOMATIC Direct Shear Data

File Name.....ttdst52a.DAT
Client.....Tetra Tech
Job Number....2592-04
Location.....Rocky Flats OLF
Date.....04-23-2008
Technician....DPM
Sample Diameter (in).....1.938
Confining Pressure (psf)..5992
Number of Passes.....1
Shear Distance (in).....0.25
Shear Rate (in/min).....0068
Soil Type.....114-181750
Boring Number.....Tt-5
Sample Number.....B Pt. A
Depth (ft).....26.5

SHEAR DEFLECTION (in)	SHEAR STRESS (lb/sqFT)	AXIAL DEFLECTION (in)
0.005	690	-.0005
0.010	1082	-.0010
0.015	1361	-.0015
0.020	1566	-.0021
0.025	1790	-.0025
0.030	2051	-.0030
0.035	2256	-.0033
0.040	2424	-.0037
0.045	2573	-.0039
0.050	2704	-.0043
0.055	2816	-.0046
0.060	2890	-.0048
0.065	2965	-.0052
0.070	3040	-.0054
0.075	3096	-.0056
0.080	3133	-.0059
0.085	3170	-.0061
0.090	3189	-.0063
0.095	3226	-.0067
0.100	3263	-.0070
0.105	3301	-.0073
0.110	3338	-.0077
0.115	3375	-.0078
0.120	3394	-.0082
0.125	3431	-.0085
0.130	3450	-.0086
0.135	3468	-.0090
0.140	3487	-.0092
0.145	3487	-.0094
0.150	3487	-.0095
0.155	3487	-.0098
0.160	3487	-.0101
0.165	3487	-.0102
0.170	3487	-.0103
0.175	3487	-.0106

Continued next page.

Pass 1 Continued

SHEAR DEFLECTION (in)	SHEAR STRESS (lb/sqFT)	AXIAL DEFLECTION (in)
0.180	3487	-.0109
0.185	3487	-.0110
0.190	3487	-.0112
0.195	3487	-.0115
0.200	3487	-.0117
0.205	3487	-.0118
0.210	3468	-.0121
0.215	3468	-.0124
0.220	3468	-.0126
0.225	3487	-.0128
0.230	3487	-.0131
0.235	3487	-.0134
0.240	3506	-.0135
0.245	3506	-.0138
0.250	3524	-.0141

Pass 1 completed with max load = 3524 psf at deflection of .2472 in

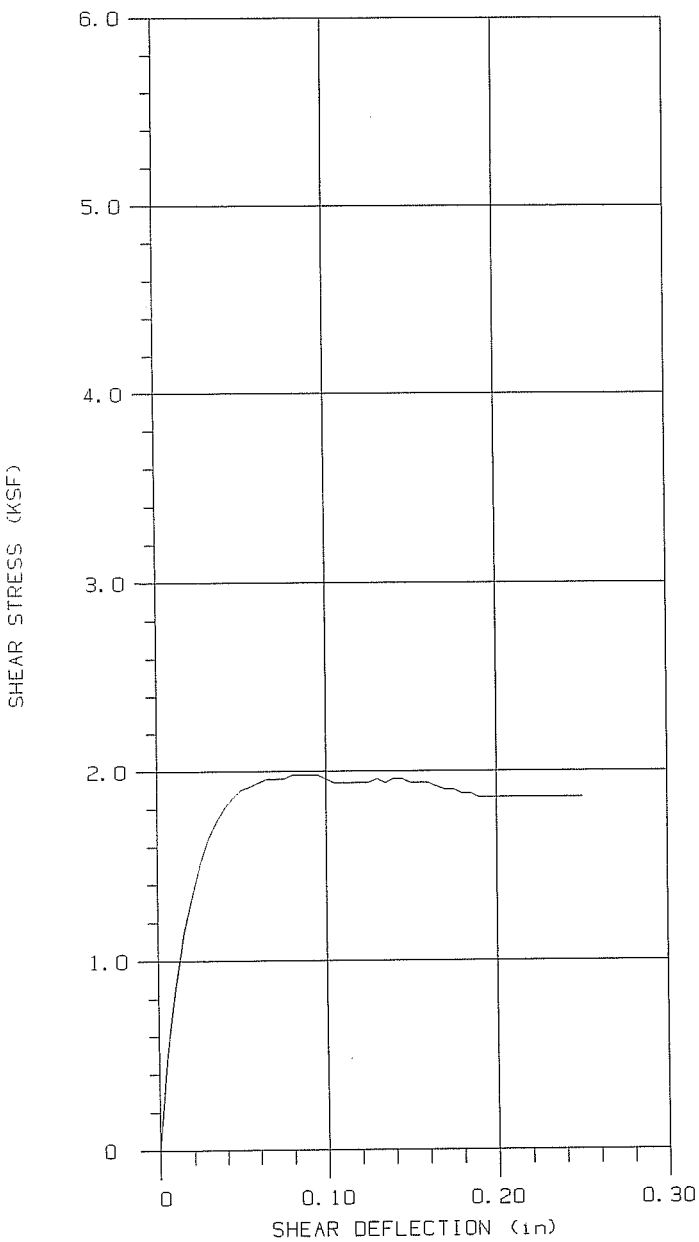
ADVANCED TERRA TESTING

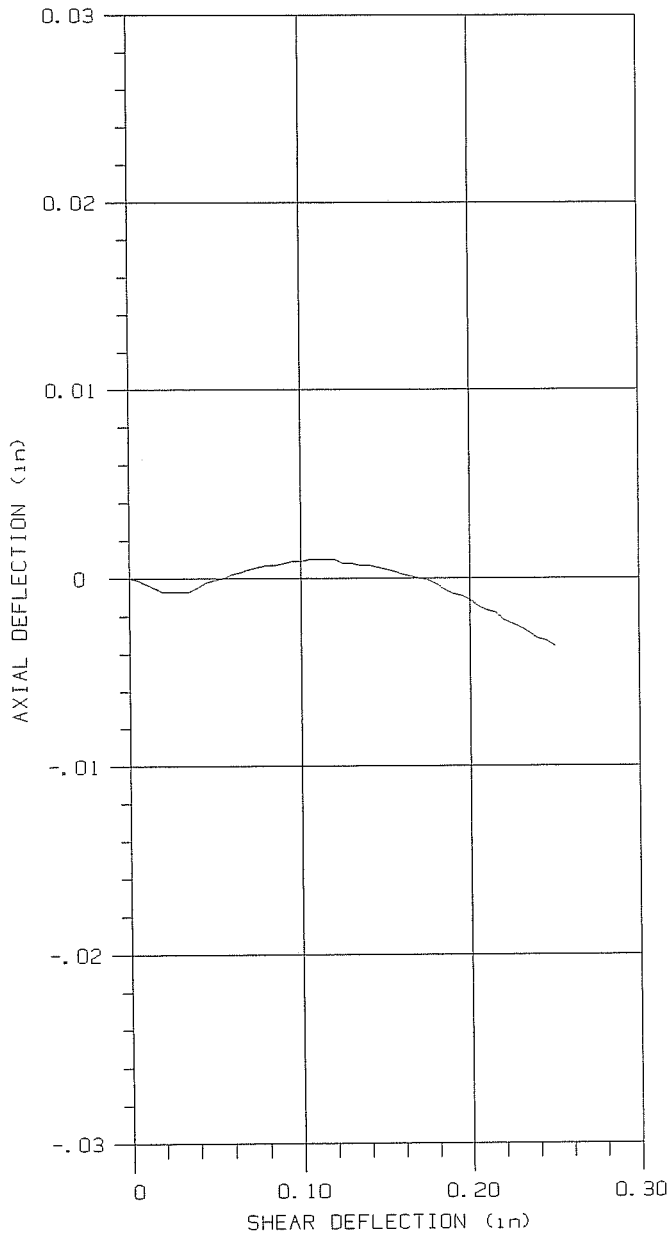
Direct Shear Test

Client..... Tetra Tech
Location..... Rocky Flats OLF

Soil Type..... 114-181750
Depth..... 26.5 (ft)
Confining Pressure.. 2938 (psf)
Shear Rate..... .0068 (in/min)
Date Tested..... 04-23-2008

Job Number..... 2592-04
Sample Number... B Pt. B
Boring..... Tt-5
File Name..... ttdst52b.DAT
Tested By..... DPM





Pass Number and Line Type....	1 ———	2 - - - - - -	3 —— -	4 —— - - —
Maximum Shear Stress.....	1977	.0000	.0000	.0000
Shear Deflection @ Max Stress.	.0752	.0000	.0000	.0000

GEOMATIC Direct Shear Data

File Name.....ttdst52b.DAT
Client.....Tetra Tech
Job Number....2592-04
Location.....Rocky Flats OLF
Date.....04-23-2008
Technician....DPM
Sample Diameter (in).....1.938
Confining Pressure (psf)..2938
Number of Passes.....1
Shear Distance (in).....0.25
Shear Rate (in/min).....0068
Soil Type.....114-181750
Boring Number.....Tt-5
Sample Number.....B Pt. B
Depth (ft).....26.5

SHEAR DEFLECTION (in)	SHEAR STRESS (lb/sqFT)	AXIAL DEFLECTION (in)
0.005	503	-.0001
0.010	858	-.0003
0.015	1138	-.0005
0.020	1343	-.0007
0.025	1510	-.0007
0.030	1641	-.0007
0.035	1734	-.0007
0.040	1809	-.0005
0.045	1865	-.0002
0.050	1902	-.0001
0.055	1921	0.0000
0.060	1939	0.0002
0.065	1958	0.0003
0.070	1958	0.0005
0.075	1958	0.0006
0.080	1977	0.0007
0.085	1977	0.0007
0.090	1977	0.0008
0.095	1977	0.0009
0.100	1958	0.0009
0.105	1939	0.0010
0.110	1939	0.0010
0.115	1939	0.0010
0.120	1939	0.0010
0.125	1939	0.0008
0.130	1958	0.0008
0.135	1939	0.0007
0.140	1958	0.0007
0.145	1958	0.0006
0.150	1939	0.0005
0.155	1939	0.0004
0.160	1939	0.0002
0.165	1921	0.0001
0.170	1902	0.0000
0.175	1902	-.0001

Continued next page.

Pass 1 Continued

SHEAR DEFLECTION (in)	SHEAR STRESS (lb/sqFT)	AXIAL DEFLECTION (in)
0.180	1883	-.0003
0.185	1883	-.0006
0.190	1865	-.0008
0.195	1865	-.0009
0.200	1865	-.0011
0.205	1865	-.0015
0.210	1865	-.0017
0.215	1865	-.0018
0.220	1865	-.0022
0.225	1865	-.0024
0.230	1865	-.0026
0.235	1865	-.0029
0.240	1865	-.0032
0.245	1865	-.0033
0.250	1865	-.0036

Pass 1 completed with max load = 1977 psf at deflection of .0752 in

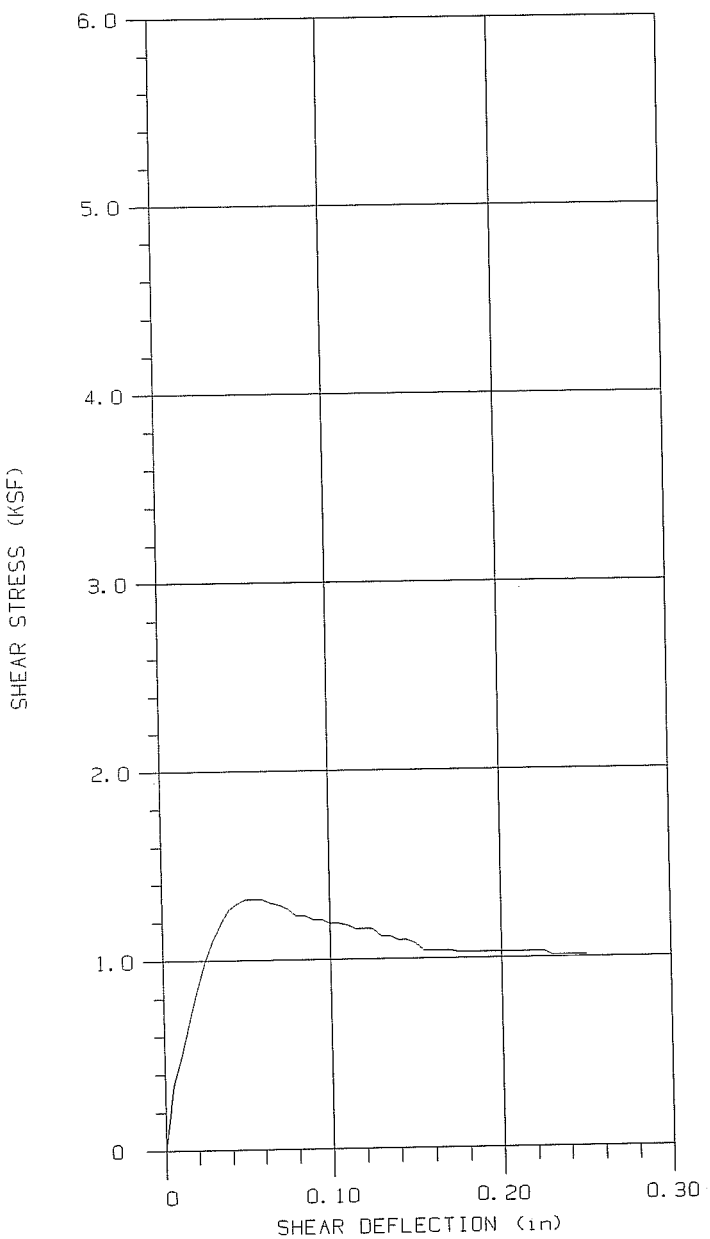
ADVANCED TERRA TESTING

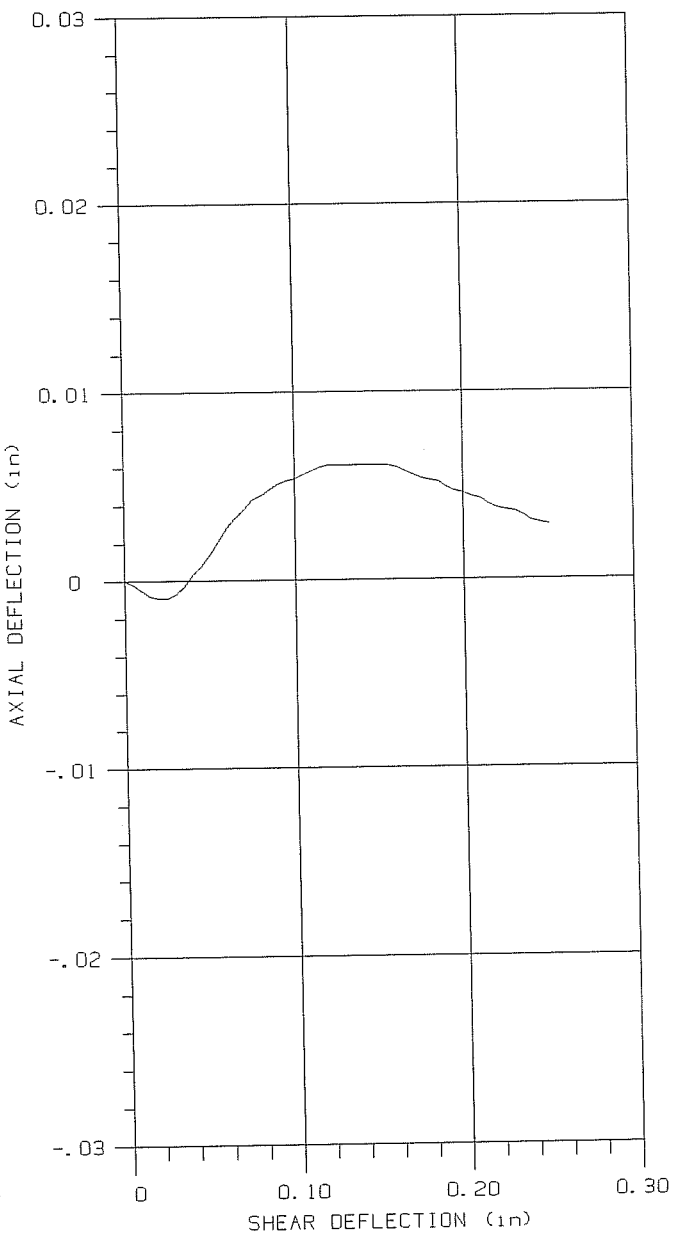
Direct Shear Test

Client..... Tetra Tech
Location..... Rocky Flats OLF

Soil Type..... 114-181750
Depth..... 26.5 (ft)
Confining Pressure.. 1469 (psf)
Shear Rate..... .0068 (in/min)
Date Tested..... 04-23-2008

Job Number..... 2592-04
Sample Number... B Pt. C
Boring..... Tt-5
File Name..... ttdst52c.DAT
Tested By..... DPM





Pass Number and Line Type....	1 ———	2 - - - - - -	3 — — —	4 — - - —
Maximum Shear Stress.....	1343	.0000	.0000	.0000
Shear Deflection @ Max Stress.	.0513	.0000	.0000	.0000

GEOMATIC Direct Shear Data

File Name.....ttdst52c.DAT
Client.....Tetra Tech
Job Number....2592-04
Location.....Rocky Flats OLF
Date.....04-23-2008
Technician....DPM
Sample Diameter (in).....1.938
Confining Pressure (psf)..1469
Number of Passes.....1
Shear Distance (in).....0.25
Shear Rate (in/min).....0068
Soil Type.....114-181750
Boring Number.....Tt-5
Sample Number.....B Pt. C
Depth (ft).....26.5

SHEAR DEFLECTION (in)	SHEAR STRESS (lb/sqFT)	AXIAL DEFLECTION (in)
0.005	336	-.0002
0.010	503	-.0005
0.015	671	-.0008
0.020	839	-.0009
0.025	988	-.0009
0.030	1100	-.0007
0.035	1193	-.0003
0.040	1268	0.0003
0.045	1305	0.0008
0.050	1324	0.0014
0.055	1324	0.0021
0.060	1324	0.0028
0.065	1305	0.0033
0.070	1287	0.0038
0.075	1268	0.0043
0.080	1231	0.0045
0.085	1231	0.0048
0.090	1212	0.0051
0.095	1212	0.0053
0.100	1193	0.0054
0.105	1193	0.0056
0.110	1175	0.0058
0.115	1156	0.0060
0.120	1156	0.0061
0.125	1156	0.0061
0.130	1119	0.0061
0.135	1119	0.0061
0.140	1100	0.0061
0.145	1100	0.0061
0.150	1082	0.0061
0.155	1044	0.0061
0.160	1044	0.0060
0.165	1044	0.0058
0.170	1044	0.0056
0.175	1026	0.0054

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Pass 1 Continued

SHEAR DEFLECTION (in)	SHEAR STRESS (lb/sqFT)	AXIAL DEFLECTION (in)
0.180	1026	0.0053
0.185	1026	0.0052
0.190	1026	0.0049
0.195	1026	0.0047
0.200	1026	0.0046
0.205	1026	0.0044
0.210	1026	0.0043
0.215	1026	0.0040
0.220	1026	0.0038
0.225	1026	0.0037
0.230	1007	0.0036
0.235	1007	0.0034
0.240	1007	0.0031
0.245	1007	0.0030
0.250	1007	0.0029

Pass 1 completed with max load = 1343 psf at deflection of .0513 in